2015-2016
JCHP
Student Catalog
NOTICE OF EQUAL OPPORTUNITY

Thomas Jefferson University is committed to providing equal educational and employment opportunities for all persons without regard to race, color, national or ethnic origin, marital status, religion, sex, sexual orientation, gender identity, age, disability, veteran’s status or any other protected characteristic. The consideration of factors unrelated to a person’s ability, qualifications and performance is inconsistent with this policy. Any person having inquiries or complaints concerning Thomas Jefferson University’s compliance with Title VI, Title IX, the Age Discrimination Act of 1975, the Americans with Disabilities Act, or Section 504 of the Rehabilitation Act is directed to contact their Student Affairs Dean or Human Resources – Employee Relations, who have been designated by Thomas Jefferson University to coordinate the institution’s efforts to comply with these laws. Any person may also contact the Assistant Secretary for Civil Rights, U.S. Department of Education, Washington, D.C. 20202, or the Director, U.S. Department of Education, Office for Civil Rights, Region Three, Philadelphia, Pennsylvania, regarding the University’s compliance with the equal opportunity laws.

REQUIRED BACKGROUND CHECK

Students who are offered admission to Jefferson are required to pass a criminal background check and child abuse clearance. Some departments within the College, as well as some clinical sites may require students to be fingerprinted and/or drug tested. The Office of Admissions will provide you with the appropriate information to complete these requirements.

Clinical rotation and fieldwork sites that require a criminal background check, child abuse clearance and/or fingerprinting may deny a student’s participation in the clinical experience, rotation or fieldwork because of a felony or misdemeanor conviction or a record of child abuse. Clinical sites may also deny participation in clinical experiences for other reasons, including but not limited to failure of a required drug test, or inability to produce an appropriate health clearance. As participation in clinical experiences, rotations or fieldwork is a required part of the curriculum and a requirement for graduation, denial of participation by a clinical site may result in delay of graduation or the inability to graduate from the program.

Regardless of whether or not a student graduates from Jefferson, individuals who have been convicted of a felony or misdemeanor may be denied certification or licensure as a health professional. Information regarding individual eligibility may be obtained from the appropriate credentialing bodies.

Thomas Jefferson University and its College of Health Professions reserve the right to amend, modify, rescind, or implement any policies, procedures, regulations, fees, conditions and courses described herein as circumstances may require without prior notice to persons who might thereby be affected. The provisions of this catalog are not and may not be regarded as contractual between or among the College, its students or its employees or agents.
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MESSAGE FROM THE DEAN
Since 1824, Jeffersonians have been leaders in education, research, healthcare delivery and community service. The faculty and administration of the Jefferson College of Health Professions are committed to working with you, our students, to continue this rich tradition.

At Jefferson we seek to be responsive to the changing needs of the healthcare system. The programs in the College continually make innovative curricular changes aimed at preparing you to function as an outstanding health professional in the dynamic environment of health care. As an integral part of a major academic health center, the College offers our students the opportunity to interact with other students in a wide range of health professions. An important characteristic of the training opportunities at Jefferson is that they mirror changes in today's healthcare system with an emphasis on the interprofessional nature of health care practice. This allows us to focus on professionals working together, understanding one another’s contributions, and effectively communicating in order to provide the best possible care for patients. In addition to the interprofessional perspective, each program curriculum is based on a set of core competencies that your faculty, accreditation agencies, professional organizations, and future employers believe are essential to effective practice. You will also find that the faculty has developed learning and training experiences that will insure that you have the knowledge, skills and experiences to prepare you to be an evidence-based practitioner.

The Vision Statement of the College commits to maintaining its status as a premier educational institution in the nation for the education, training and clinical preparation of outstanding health professionals. It can make this claim because it draws upon the rich resources within Thomas Jefferson University and Jefferson Health. Jefferson also competes successfully at the national level as a research institution. Faculty members are recognized for their achievements in scholarly activities, research, and teaching, all of which provides the perfect backdrop for excellent educational experiences for its students.

JCHP students are successful when completing required licensure and registry examinations (consistently above the national average) and experience high employment placement rates. Graduates tell us that their degree opens exceptional access to employment in the healthcare system. Our programs are designed to give you the knowledge and skills necessary to enter or advance in the practice of health care, and to help you develop confidence in your professional roles, positive attitudes, critical thinking skills, problem-solving strategies, and sound professional ethic. We expect you to leave Jefferson College of Health Professions a proud and confident graduate who will bring credit to your profession and your alma mater.
JEFFERSON COLLEGE OF HEALTH PROFESSIONS
The Jefferson College of Health Professions (JCHP) provides innovative academic programs to a highly qualified, culturally diverse student body with the goal of developing outstanding professionals and future leaders in health care. Through a broad array of undergraduate and graduate programs, the College is committed to the development of the healthcare team, leadership in interprofessional healthcare education, and the concept of lifelong learning. A shared goal of the educational programs is the generation of new healthcare knowledge through scholarship and applied, collaborative, and interdisciplinary research. The College also addresses the needs of the community through service initiatives. Teaching, learning, scholarship, research, practice and community service are accomplished in a supportive environment that recognizes the distinct contributions of students, faculty, administration, staff, alumni and friends of Jefferson.

The Jefferson College of Health Professions offers undergraduate and graduate degree programs, and is comprised of seven academic departments: Medical Laboratory Sciences and Biotechnology, Couple and Family Therapy (CFT), Occupational Therapy (OT), Physician Assistant Studies (PA), Physical Therapy (PT), Radiologic Sciences, and Professional and Continuing Studies. Office locations for the Office of the Dean and the academic departments within JCHP can be found in the Jefferson Health Professions Academic Building (Dean’s Office, PT, OT, Radiologic Sciences) and the Edison Building (PA, BST, CFT, Professional & Continuing Studies). The Jefferson Health Professions Academic Building, opened in 2012, is also home to Jefferson’s Colleges of Nursing, Pharmacy and Population Health. Each College has been consolidated into a central shared space, enhancing opportunities for collaboration and research.

Specialty tracks are offered in the Department of Medical Laboratory Sciences and Biotechnology (bachelor’s and master’s programs in biotechnology, cytotechnology, medical laboratory sciences) and the Department of Radiologic Sciences (bachelor’s programs in radiography, general sonography, cardiac sonography, invasive cardiovascular technology, computed tomography, magnetic resonance imaging, medical dosimetry, nuclear medicine, radiation therapy and vascular technology). An executive master’s program and a PET/CT certificate program for technologists credentialed in nuclear medicine are also offered in the Department of Radiologic Sciences. In the Department of Occupational Therapy, a combined bachelor’s and master’s program is offered, as well as entry-level master’s and clinical doctoral (OTD) programs. The Department of Physical Therapy offers a clinical doctorate (DPT). The Master’s in Family Therapy (MFT) is offered through the Department of Couple and Family Therapy. The Department of Physician Assistant Studies offers a Master of Science in Physician Assistant Studies. The Department of Professional and Continuing Studies offers a variety of certificate programs, including medical coding and data quality, medical practice management, and healthcare management information systems, as well as a bachelor’s degree program with majors in health services management, health professions management and health services management information systems.
MISSION OF THE COLLEGE OF HEALTH PROFESSIONS
The Jefferson College of Health Professions is committed to educating health care professionals of the highest quality and ethical standards for contemporary practice in the global community. By promoting faculty excellence in teaching, research and service, we prepare caring professionals who are competent in the use of evidence based practice, critical in their thinking, committed to lifelong learning and prepared to be leaders in diverse health care settings. In keeping with the mission of the University and the future of health care delivery, the Jefferson College of Health Professions is committed to interdisciplinary education and technologies that draw upon the strengths of all disciplines.

VISION OF THE COLLEGE OF HEALTH PROFESSIONS
The Jefferson College of Health Professions strives:
- To be among the premier educators of healthcare practitioners in the nation
- To define the future of clinical care
- To be a major center for patient-oriented research and clinical trials
- To be a knowledge leader in selected areas of basic research

ACCREDITATION
Thomas Jefferson University is fully accredited by:
  Middle States Commission on Higher Education
  3624 Market Street
  Philadelphia, PA 19104
  (267) 284–5000
  info@msche.org
  españolinfo@msche.org (Spanish)

In addition to full accreditation by the Middle States Commission on Higher Education, the following professional programs of the Jefferson College of Health Professions are approved by the appropriate accrediting agencies:

Medical Laboratory Sciences and Biotechnology Programs
Cytotechnology Program
Commission on Accreditation of Allied Health Education Programs (CAAHEP), in collaboration with the Cytotechnology Programs Review Committee of the American Society of Cytopathology
CAAHEP
1361 Park Street
Clearwater, FL 33756
(727) 210-2350
(727) 210-2354 (fax)
www.caahep.org
Medical Laboratory Science Programs
National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
5600 North River Road, Suite 720
Rosemont, IL 60018-5119
(847) 939-3597
(773) 714-8880
(773) 714-8886 (FAX)
www.naacls.org

Couple and Family Therapy
Marriage and Family Therapy Program
Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE)
112 South Alfred Street
Alexandria, VA 22314
(703) 838-9808
(703) 838-9805 (FAX)
https://www.aamft.org

Occupational Therapy Programs
Accreditation Council for Occupational Therapy Programs (ACOTE) of the American Occupational Therapy Association
4720 Montgomery Lane
PO Box 31220
Bethesda, MD 20824-1220
301-652-6611 x2914
accred@aota.org
http://www.aota.org/Education-Careers/Accreditation/Contacts.aspx

Physician Assistant Studies Program
Accreditation- Provisional Status
Accreditation Review Commission on Education for the Physician Assistant, Inc, (ARC-PA)
12000 Findley Road, Suite 150
Johns Creek, GA 30097
(770) 476-1224
(770) 476-1738 (FAX)
http://www.arc-pa.org/

Physical Therapy Program
Commission on Accreditation in Physical Therapy Education (CAPTE)
Department of Accreditation
American Physical Therapy Association
1111 North Fairfax Street
Alexandria, VA 22314-1488
(703) 706-3245
accreditation@apta.org
Radiologic Sciences Programs

General Sonography, Cardiac Sonography and Vascular Sonography Programs

Commission on Accreditation of Allied Health Educational Programs (CAAHEP), in collaboration with the Joint Review Committee on Education in Diagnostic Medical Sonography (JRCDMS)

CAAHEP
1361 Park Street
Clearwater, FL 33756
(727) 210-2350
(727) 210-2354 (fax)
mail@caahep.org
www.caahep.org

JRCDMS
6021 University Boulevard, Suite 500
Ellicott City, MD 21043
(443) 973-3251 (fax)
jrcdms@intersocietal.org
www.jrcdms.org

Magnetic Resonance Imaging, Medical Dosimetry, Radiography and Radiation Therapy Programs

Joint Review Committee on Education in Radiologic Technology (JRCERT)
20 N. Wacker drive, Suite 2850
Chicago, IL 60606-3182
(312) 704-5300
(312) 704-5304 (fax)
mail@jrcert.org
www.jrcert.org

Nuclear Medicine Program

Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)
2000 W. Danforth Rd., Suite 130 #201
Edmond, OK 73003
(405) 285-0546
(405) 285-0579 (fax)
jrcnmt@coxinet.net
www.jrcnmt.org

Graduates are eligible to take the qualifying examinations of the state and/or national licensing or registry bodies and to become members of the appropriate professional organizations.
Registration Policies & Procedures

REGISTRATION POLICIES AND PROCEDURES
Students are responsible for becoming familiar with and observing the registration policies and procedures of the College and University. If a student is unclear on any material presented, s/he should consult with his/her academic advisor, program director, Department Chair, or appropriate University office.

Prior to each registration period, students are provided with detailed instructions and materials for registration. With the assistance and guidance of their faculty advisors, students matriculated in degree or certificate programs must register for classes according to the schedule as published in the Academic Calendar. Any registration made after the conclusion of the official registration period will require payment of a late registration fee.

Completion of registration in accordance with instructions issued by the University Office of the Registrar is a prerequisite to class attendance. A student is not considered registered for class until all appropriate scheduling processes have been completed and all tuition and fees have been paid, on or before the payment date for each academic term and all Jefferson College of Health Professions matriculation requirements have been satisfied.

ACADEMIC CREDIT
Academic credits are awarded on the semester-hour basis. The primary calendar consists of two 15-week semesters, including final examinations, as well as multiple summer sessions of variable length. On this calendar, a lecture course normally meets for the equivalent of one 55-minute class period per credit hour each week. While the distribution of time varies from course to course, a three-credit lecture course typically meets for the equivalent of three 55-minute periods each week. A one-credit laboratory meets for the equivalent of at least two 55-minute periods per week, and a one-credit clinical or practicum course meets for the equivalent of at least three 55-minute periods per week. Courses offered on an accelerated schedule will vary from this format.

CREDIT HOUR ASSIGNMENT IN ONLINE CURRICULA
The number of credit hours for courses that meet face-to-face with an instructor is defined by the number of hours spent in classroom; credit hours in synchronous and asynchronous online environments are recorded in the same manner as for traditional classes in the Jefferson College of Health Professions (JCHP).

The definition of credit hours in combined synchronous and asynchronous learning environments for fully online programs in JCHP with no corresponding traditional courses is based on the following guidelines:

1. The course syllabus provides clear documentation that includes the course objectives, the course topics, and the stated expectations for readings, projects, and other assignments, as well as the stated learning outcomes.
2. In developing and planning courses for the synchronous and asynchronous learning environment in JCHP programs, faculty estimate the time a typical student would take interacting with the course content. Content is documented in each course syllabus. Hours for completing assignments, readings, and working on projects, are considered within the credit hour requirements for the course. This is consistent with the American Public University's (2012) model for calculating total contact hours in online coursework as inclusive of both in-class and homework projects.

3. Faculty determine class attendance by the evaluation of student participation in scheduled online discussions, required interaction with the faculty, as well as interaction with peers, and the timely submission of class assignments rather than simply by the number of logins provided in the statistics measured by the course management system. The quality and quantity of work demonstrated the rigor and time on task assignments is equal to that which would be required if a traditional course delivery format were used. However, all current JCHP courses that are part of all-online curricula were developed specifically for the online format (not using traditional face to face classes as a model or starting point), and no “parallel offerings” (MSCHE, 2009, p. 58) exist. Thus, it is not necessary (or possible) to compare traditional and online formats side by side as it is with other TJU programs such as the JCN program.

4. Courses developed specifically for online delivery must be approved through the JCHP Committee on Educational Philosophy and Policy in the same way as new traditional campus-based courses.

5. The process and procedures for offering online courses are the same as all other JCHP courses, including registration requirements and regulations (e.g., drop-add period, withdrawal procedures) and educational policy including the JCHP grading system and use of recommended syllabus elements from by the JCHP Committee on Educational Philosophy and Policy.

References


FULL-TIME STUDENT STATUS
Undergraduate students must take a minimum of twelve (12) credits per semester to be considered full-time. To maintain full-time student status in a graduate program, students must enroll for at least nine (9) credits per semester.

AUDITING
An undergraduate student may audit a course with the written permission of the instructor. The student must register for the course during the registration period and pay the regular course fee. The registration for any course may not be changed from audit to credit or vice versa after the first week of class.
CHANGES OF SCHEDULE: DROPPING AND ADDING COURSES

Students who wish to revise their schedules after initial registration must complete a Schedule Change Form and return it with the appropriate signatures to the University Office of the Registrar by the deadline published in the Academic Calendar. During the fall and spring semesters, the Drop/Add period is normally two weeks. In accelerated terms such as the summer sessions, it is proportionately less. **Note: Please refer to the academic calendar for specific Drop/Add deadlines.

It is the students’ responsibility for consulting with their advisors on how course registration changes will affect their progress toward degree completion. Additionally, prior to changing their schedules, students receiving financial assistance should consult with the University Office of Financial Aid to determine what effect the change may have on their eligibility for aid or deferments on payment of student loans.

Students who are matriculated in a baccalaureate degree or post-baccalaureate certificate program are not permitted to drop all courses in a term without obtaining an approved Leave of Absence or withdrawing from the School, and they will be subject to the refund policy as described in the JCHP Student Handbook.

Students who stop attending classes without filing the required Course Drop form will be responsible for the full payment of tuition and will receive a grade of F for the course. Verbal notification to the course instructor does not constitute an official course drop.

COURSE WITHDRAWAL

Following the conclusion of the Drop/Add period, a student may withdraw from a course by completing a Schedule Change Form (which can be obtained from the University Office of the Registrar or the student’s academic department) and secure the necessary approvals from the appropriate academic department. A student who is authorized to withdraw from a course prior to the date published in the Academic Calendar will receive a grade of W.

A student who withdraws from a course after the date published in the Academic Calendar will receive a grade of WP (Withdrew-Passing) or WF (Withdrew-Failing), depending upon the level of work at the time of withdrawal. No credits or quality points are given for either grade; however, the grade of WF is included in the calculation of the student’s grade point average as a course failure. In order to receive credit for a course from which a student has withdrawn the student must re-register for the course in a subsequent semester.

Prior to withdrawing from courses and/or the College, students receiving financial assistance should consult with the University Office of Financial Aid to determine what effect the change may have on their eligibility for aid or deferments on payment of student loans.

Additionally, students should understand that withdrawal from a course does not release a student from payment of tuition for that course. Students should refer to the Refund Policy governing course withdrawal and/or the Employee Tuition Assistance Policy located in the Tuition and Fees section of this Catalog.
Students who stop attending classes without filing the required Course Withdrawal form will be responsible for the full payment of tuition and will receive a grade of F for the course. Verbal notification to the course instructor does not constitute an official course withdrawal.
Tuition and Fees

TUITION AND FEES
2015-2016 Tuition and related fees for the various programs in the College may be found at the Tuition and Fee website at: www.jefferson.edu/registrar/tuition/.

TUITION AND FEES FOR FULL-TIME STUDENTS
Students enrolled on a full-time basis in the health professions programs (12 or more semester credits in undergraduate programs, 9 or more in graduate programs) are billed the prevailing tuition and fees.

Tuition is billed semi-annually, prior to the beginning of the fall and spring semesters. Except for the conditions noted below, this covers the tuition charges for all required courses in the full-time curriculum. This may include courses that are scheduled during one or more summer sessions.

Additional Tuition Charges Beyond the Full-Time Tuition
In addition to payment of tuition, full-time students are responsible for additional tuition charges on a per-credit basis under the following circumstances:

- Students whose registration exceeds the maximum number of credits allowable in their curriculum (specified in the course curriculum for a given term or semester, as outlined in this Catalog).
- Students who choose to take one or more courses when they are not required to do so by their curriculum, for example, during a summer session. This includes enrolling in an elective course, a prerequisite course required for admission or in a required course that is taken out of the sequence prescribed in the curriculum.

Approval from the respective Department Chair and the Chair of the Department of Professional and Continuing Studies may be required before registering for any Professional and Continuing Studies courses that are not part of a regularly scheduled academic program.

All deposit payments, advance payments, loans, grants or scholarships awarded will be credited to the student’s account. All loan arrangements, including completion and submission of signed documents, must be completed before credit for such awards will be granted.

PART-TIME STUDENT TUITION AND FEES
Students enrolled on a part-time basis (fewer than 12 semester credits in undergraduate programs and 9 semester credits in graduate programs) are billed based on the total credits for which they have registered as specified on the tuition and fee website. All tuition and fees charged are due and payable at the date of registration.

Various services are included in the tuition for full-time students; however, for students enrolled on a basis other than full-time, these services are only available upon payment of the appropriate fees. For example, to have access to the Jefferson – Independence Blue Cross Wellness Center, part-time students are required to pay a Membership Fee. Family memberships are also available to students’ spouses, domestic partners and children. For more information, visit the Office of Student Life & Engagement or call (215) 503-7743.
CHALLENGE EXAMINATION FEE
Fees for optional challenge examinations that are not a part of the standard curricula will be charged in addition to the prevailing tuition. Those that are taken in lieu of completing a prescribed course are not charged in addition to tuition. Challenge examinations are offered at the rate of $100 per exam. To register for a challenge examination, please contact the Department of Professional and Continuing Studies at (215) 503-8414.

OTHER EXPENSES
Students will be advised of requirements for uniforms, equipment and other necessary expenditures for classroom and clinical experiences by the respective departments, as appropriate. Students must pay for other miscellaneous expenses such as bookstore bills, library fines and housing rentals.

Lockers are available for student use throughout the academic year during rental periods which run on a semester by semester basis; both half and full size lockers are available for a fee. Lockers are assigned by the Office of Student Life & Engagement. The University is not responsible for the loss or damage of personal property.

JEFFERSON EMPLOYEE TUITION ASSISTANCE
With its tuition assistance programs, Jefferson recognizes the importance of providing its employees with the opportunity for self-development through continuing education. We believe that continued self-development will enable employees to fulfill Jefferson’s requirement for a highly skilled, professional workforce.

View details about the tuition assistance program on the Human Resources website under Current Employees, Benefits Information.

BILLING
Invoices for tuition and fees are listed on Banner Web and emailed to your Jefferson email account prior to each academic term, and payment of all outstanding fees is payable on dates specified. Balances that remain outstanding beyond the due date are subject to a late payment penalty of $25 per month.

Below is a list of payment options for your eBill:

- Online - Jefferson partners with TouchNet to provide a secure, 24/7 environment for online services including eBill, ePayment and eRefunds
  - Electronic check
  - Visa/MasterCard
- Check - payable to Thomas Jefferson University
  - Mail to address on eBill with remittance stub
  - In person
- Cash
  - In person
- Wire Transfer
  - Contact Student Accounts for banking information
- Tuition Management Systems installment plan
- Jefferson Employee Tuition Reimbursement
• Submit Jefferson Tuition Assistance Application to Human Resources each semester no later than tuition invoice due date

• Third-party Reimbursement
  o Submit letter from employer on company letterhead noting student's name, amount to be reimbursed, statement noting payment directly to Thomas Jefferson University within three weeks of final exam
  o Submit reimbursement request to Student Accounts no later than tuition invoice due date

Students who do not satisfy their obligations in full will be refused registration and class attendance. The University reserves the right to deny grades, transcripts, promotions and diplomas to students who have not fully satisfied all financial obligations to the University.

LATE REGISTRATION
Late registration for classes may be permitted as space and other circumstances warrant. Registration made after the conclusion of the official registration period will require payment of a late registration fee.

CHANGES OF SCHEDULE: DROPPING AND ADDING COURSES
Please refer to the procedures for changes of schedule outlined in the Registration Policies and Procedures section above. Students will not incur tuition costs for courses dropped prior to the deadline date published in the Academic Calendar.

Students who stop attending classes without filing the required Schedule Change form will be responsible for the full payment of tuition and will receive a grade of F for the course. Verbal notification to the course instructor does not constitute an official course drop.

COURSE WITHDRAWAL
Please refer to the procedures for course withdrawal outlined in the Registration Policies and Procedures section above. For tuition payment obligation on withdrawal from classes, please refer to the refund policy below.

Students who stop attending classes without filing the required Schedule Change form will be responsible for the full payment of tuition and will receive a grade of F for the course. Verbal notification to the course instructor does not constitute an official course withdrawal.

REFUND POLICY
A student who withdraws or takes a leave of absence may be eligible for a pro-rated tuition refund. The refund is based on the number of weeks the student was in attendance during the prevailing term covered by the tuition payment period. A student who is dismissed or suspended because of a violation in College and/or University policy is not eligible for a refund.

Full-time students: TJU maintains two tuition payment periods within each academic year for full-time programs. For tuition payment periods covering multiple sessions (i.e. Physical Therapy), the prevailing session is the first session included in that tuition payment period.
Part-time students: Students are billed on a per credit basis. The tuition refund period is based on the schedule of classes for that session as indicated below. The Effective Date is the date in which the student ceased to be enrolled and is evidenced by the signature date of the academic department. The Effective Date will determine the percentage of tuition for which the student is obligated and is calculated according to the following schedule:

<table>
<thead>
<tr>
<th>Full Time Students- Effective Date</th>
<th>Applicable Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and second week of classes of prevailing term</td>
<td>100%</td>
</tr>
<tr>
<td>Third and fourth week of classes of prevailing term</td>
<td>50%</td>
</tr>
<tr>
<td>Fifth and sixth week of classes of prevailing term</td>
<td>25%</td>
</tr>
<tr>
<td>Seventh week (and thereafter) of classes of prevailing term</td>
<td>0%</td>
</tr>
</tbody>
</table>

For summer and other accelerated sessions, the percentage of refund is pro-rated proportionately according to the length of the academic term.

<table>
<thead>
<tr>
<th>Summer &amp; Accelerated Sessions- Effective Date</th>
<th>Applicable Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 7 days</td>
<td>100%</td>
</tr>
<tr>
<td>Second week</td>
<td>50%</td>
</tr>
<tr>
<td>Third week</td>
<td>25%</td>
</tr>
<tr>
<td>Fourth week</td>
<td>0%</td>
</tr>
</tbody>
</table>

A class week is defined as the seven-day period beginning on the first day of class of an academic term as indicated on the University Academic calendar; it is not the first day of attendance by a student.

To be granted a withdrawal or leave of absence, a student must follow the required procedure as defined JCHP Student Handbook, and must have fully satisfied all financial obligations to the University.

Students who receive Jefferson Employee Tuition Assistance are subject to the terms defined in that policy; this includes full payment of all tuition and fees for any course from which the student withdraws or fails to earn a final grade of C or better.
Financial Aid

FINANCIAL AID GENERAL INFORMATION
Jefferson recognizes that a major concern of many students is the financing of their education and attempts to help those students with demonstrated financial need to meet the cost of their education. Although every attempt is made to assist students, it is the Jefferson’s philosophy that the primary responsibility for the cost of college education rests with students and their families. Because education is an investment that yields lifelong dividends, both students and their families should be prepared to contribute and to provide financial support. Financial aid is intended to supplement the best efforts of the students and their families.

FINANCIAL AID PROCESS
Financial aid is available to qualified students who are matriculated in degree and eligible post-baccalaureate certificate programs. Financial aid awards are based on each student’s financial need, enrollment status, housing status, level of program funding and maintenance of satisfactory academic progress. A student’s financial need is computed as the cost of education minus the expected family contribution as determined through the Federal Methodology.

The Free Application for Federal Student Aid (FAFSA) is used to determine financial need. These forms are confidential statements of income and assets for both students and families. The information is analyzed to determine the financial strength of the applicant in terms of income, assets, liabilities, size of family, number of family members in post-secondary education, age of parents, etc. The aim is to make the expectations for the family contribution as equitable as possible for each applicant.

Jefferson assumes that the first financial aid resource that all students should consider is the Federal Direct Stafford Loan. If, after obtaining the Federal Direct Stafford Loan, need still exists, the University Office of Financial Aid will assist the student in determining the appropriate combination of loans, grants and work study to make a Jefferson education possible. Institutional funding is limited and is not guaranteed to any student.

Students will be notified of their specific eligibility for aid through a financial aid award. Notification of aid awards usually begins four to five months prior to the start of the academic term. Awards may not be determined unless a financial aid file is complete and all student and parent information has been verified. All financial aid notifications will be sent to the student’s Jefferson email account.

If a student demonstrates financial need, but is ineligible for federal grants or loans due to default on a prior educational loan and/or negative credit rating, Thomas Jefferson University will not commit institutional funds to remedy the default or negative credit status, or to compensate for the ineligibility for federal funds. The student is ultimately responsible for resolving all problems involving loan delinquencies, defaults, and/or any other circumstances that would result in the student being ineligible to borrow through any loan program.
STUDENT EXPENSE BUDGET
A student’s budget is divided into two categories – direct and indirect costs. Direct costs are paid directly to Jefferson and are standard for each student. Indirect costs vary from student to student, depending on factors such as academic major, personal life-style and distance from home to campus. A student’s expense budget will vary by major and academic level. Please check with the University Office of Financial Aid for your exact costs.
* For the most recent tuition/fee information, visit https://w3.jefferson.edu/registrar/tuition/.

APPLICATION PROCEDURE
Any student who is concerned about the ability to meet educational expenses at Thomas Jefferson University should apply for aid. Eligibility for assistance varies from program to program. Families may be eligible for some sources of aid that they may not have anticipated. To avoid possible delays in receiving an award, students are urged to comply with all application deadlines. Students should adhere to financial aid application deadlines even if an admissions decision has not been made.

Jefferson expects all aid applicants to file the following documents before the financial aid deadline:
- Free Application for Federal Student Aid (FAFSA) – using IRS Data Retrieval Transfer process
- Educational Plan (part time students and/or those charged per credit only)

The Financing Your Education Financial Aid Guide can be found on the Publications menu on the Financial Aid Office webpage at www.jefferson.edu/financial_aid. The Guide is accompanied by important information about applying for financial aid. Accepted students will be permitted to apply for financial aid online. An informational email is sent to all accepted students starting in December/January with Banner Web online application instructions. It is important for students to begin and complete the application process in a timely manner. An application may not be reviewed until all information is received.

Students must be matriculated in a degree or eligible post-baccalaureate certificate program on at least a half-time basis to be eligible for financial aid. The amount of aid a student may receive is determined by the number of credits attempted and the tuition costs.

Baccalaureate and Certificate Programs

<table>
<thead>
<tr>
<th>Status</th>
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<td>Three-quarter time</td>
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Graduate Programs

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<td>9 credits or more</td>
</tr>
<tr>
<td>Half-time</td>
<td>5 credits or more</td>
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</tbody>
</table>

Students seeking to qualify as self-supporting or independent must meet strict Federal requirements. Consult the University Office of Financial Aid before filing as an independent student to ensure proper completion of the forms.
Specific information regarding disbursement of funds and other award-related information is contained in the Financial Aid Handbook. Students may access the online Financial Aid Handbook at www.jefferson.edu/financial_aid.

RENEWAL OF AID
Students must apply each year for financial assistance. Renewal of aid is not automatic. Financial need is determined each year based on changes of family circumstances as well as Jefferson’s fees and funding levels. Because federal, state or institutional policies may change each year, students who did not receive aid in previous years are still encouraged to apply for aid the following year. A change in circumstances may enable the returning student to qualify for assistance.

FINANCIAL AID DEADLINE
The priority deadline for completing a financial aid file is April 1 for all new students (except those beginning a program of study in January) and on or about March 15 for all returning students. The deadline for students beginning their program of study in January is August 1. Applications completed after the deadline will be considered if funds are available. Students should complete the necessary forms as soon as they are available in order to meet all deadlines. (Please Note: The needs analysis forms may require 5 to 7 days for processing by the processor.)

AID PROGRAMS
Financial aid awards usually consist of a “package” of three basic types of financial assistance: non-repayable gift or grant assistance, student loans and student employment. Financial assistance comes from three major sources: federal, state and Jefferson-administered programs. The major programs are described below:

Federal Sources of Aid
Federal Pell Grant: The Federal Pell Grant program is designed to provide assistance to undergraduate students pursuing their first undergraduate degree. Federal Pell Grants are intended to be the foundation of a financial aid package and may be combined with other forms of aid in order to meet the costs of education. The amount of the Federal Pell Grant is determined on the basis of the financial resources of the student and family, the student’s enrollment status and the cost of education. Awards for the 2015-2016 academic year may range up to a maximum of $5775 for a 9-month enrollment period.

Federal Supplemental Educational Opportunity Grant (SEOG): This program provides grant assistance for Pell-eligible undergraduate students with exceptional financial need. The amount of assistance a student can receive depends on need, the availability of Federal SEOG funds and the amount of other aid a student receives. Recipients are selected by the University Office of Financial Aid in accordance with Department of Education guidelines.

Federal Work Study Program (FWS): This program provides funding for jobs for undergraduate and graduate students who have financial need and want to earn funds to cover a part of their educational expenses. Employment opportunities are provided on campus. Jefferson also offers opportunities in community service as part of the FWS program. The FWS award a student receives depends on need,
availability of FWS funds and the amount of aid received from other programs. The administration of this program is in accordance with the guidelines published by the Department of Education.

**Federal Direct Loan Program**

- Federal Subsidized Stafford Loan
- Federal Unsubsidized Stafford Loan
- Federal PLUS Loan
- Federal Graduate PLUS Loan

This federal program provides long-term, low-interest student loans available directly through the federal government only. These loans are available to matriculated students enrolled in an institution of higher learning on at least a half-time basis. Students should go to the Financial Aid Office website [www.jefferson.edu/financial_aid](http://www.jefferson.edu/financial_aid) or to the federal website [http://studentloans.gov](http://studentloans.gov) for more information. For loans first disbursed between July 1, 2006 and June 30, 2013, the interest rate was fixed at 6.8 percent. For loans issued after July 1, 2013, interest rates are set at a variable fixed rate, not to exceed 8.25% for undergraduate students and 9.5% for graduate students. Repayment of these loans begins six months after the student ceases to be enrolled on at least a half-time basis, graduation, or withdrawal from school. A two to three week processing period should be anticipated for all Federal Direct Stafford Loan applications.

**Annual Maximum Federal Direct Subsidized Stafford Loan**

Third and fourth year undergraduates may apply for a maximum of $5,500. The total Federal Direct Subsidized Stafford Loan aggregate limit for undergraduates is $23,000 and $65,500 for graduate or professional students. Due to Federal Budget Control Act of 2011, graduate students are no longer eligible to borrow the subsidized Federal Direct Stafford Loan, beginning with the 2012-2013 year.

**Annual Maximum Federal Direct Unsubsidized Stafford Loan**

Third and fourth year independent undergraduates may apply for up to $12,500 a year with at least $7,000 from the unsubsidized program. Dependent undergraduate students may apply for $2000 in the Federal Direct Unsubsidized Stafford Loan. Graduate students may apply for up to $20,500 a year.

Students must demonstrate financial need to qualify for a Federal Direct Subsidized Stafford Loan. For periods of enrollment beginning on or after October 1, 1992, students who do not demonstrate financial need may qualify for an unsubsidized Federal Stafford Loan. The Federal government pays the interest on a subsidized Federal Stafford Loan while the student is enrolled. However, interest accrues to the student’s loan account on an unsubsidized Federal Stafford Loan starting from the date the funds are disbursed. Payment of principal and accrued interest may be postponed until six months after the student ceases to be enrolled on at least a half-time basis, graduation, or other cessation of enrollment.

**Federal Direct PLUS Loan Program (Parent Loan)**

The Federal Direct PLUS loan program makes credit-based loans available to pay for the costs of study at post-secondary schools. Under the Federal Direct PLUS program, parents are eligible to borrow on behalf of dependent undergraduate students. Loan funds may be used only to pay for students’ educational costs.
Parents of dependent undergraduate students are eligible to borrow up to the student’s annual estimated cost of attendance minus the estimated annual financial assistance.

The interest rate for Federal Direct PLUS loans disbursed between July 1, 2010 and June 30, 2013 was 7.9%. This is a fixed interest rate. For loans issued after July 1, 2013, interest rates are set at a variable fixed rate, not to exceed 10.5%.

**Federal Graduate PLUS Loan Program (for graduate students only)**

The Federal Graduate PLUS loan program makes loans available to pay for the costs of study at post-secondary schools. Under the Federal Graduate PLUS program, graduate students are eligible to borrow this credit-based loan on their own merit. Loan funds may be used only to pay for students’ educational costs. If eligible, students may borrow up to the student’s annual estimated cost of attendance minus the estimated annual financial assistance.

The interest rate for Federal Direct PLUS loans disbursed between July 1, 2010 and June 30, 2013 was 7.9%. This is a fixed interest rate. For loans issued after July 1, 2013, interest rates are set at a variable fixed rate, not to exceed 10.5%.

**Federal Perkins Loan**

This program provides a 5% interest loan to undergraduate and graduate students who demonstrate financial need. Depending on when the student applies, the student’s level of need and the school’s funding level, undergraduates may be awarded up to $5500 per year and graduate students may be awarded up to $8000 per year. The loans are interest-free while the student is enrolled on at least a half-time basis. The maximum repayment period of 10 years, begins nine months after the student ceases to be enrolled on at least a half-time basis. Under certain federally approved circumstances, borrowers may defer loan repayment and/or have a portion of their loans cancelled. Borrowers should note both deferment and cancellation provisions when negotiating the loan. Recipients are selected by the University Office of Financial Aid in accordance with guidelines published by the Department of Education. However, this program is currently being phased out by the federal government and no new loans can be offered.

**State Sources of Aid**

State Grants: All students are required to apply to their state grant program to determine any eligibility they may have for state funds. Applications for state grants are made by completing the Free Application for Federal Student Aid (FAFSA) by the deadline specified by their state.

**Pennsylvania Residents**

The Pennsylvania Higher Education Assistance Agency (PHEAA) administers the state sponsored program that provides funds for full-time and some part-time undergraduate students who are Pennsylvania residents and demonstrate financial need as determined by PHEAA. Awards for the 2013-2014 academic year ranged up to a maximum of $4,010. The deadline for filing is May 1.

Pennsylvania residents may obtain additional information about the Pennsylvania state grant by contacting the PHEAA Grant Division at (800) 233-0557 or by accessing their web page at [www.pheaa.org](http://www.pheaa.org).
New Jersey Residents
New Jersey residents may obtain grant funds to attend colleges in Pennsylvania on a very limited basis. New Jersey residents should contact their state agency for further information regarding their eligibility.

Higher Education Student Assistance Authority (HESAA)
PO Box 540
Trenton, NJ 08625
(800) 792-8670 www.hesaa.org

Other States
Students from other states may obtain state grant assistance to attend a college outside their state of legal residence on a limited basis. Non-Pennsylvania residents should contact their state agency for further information regarding their eligibility.

Jefferson Sources of Aid
Thomas Jefferson University Grants and Loans: Grants and low interest loans are available to students who exhibit financial need and potential for academic achievement. Application for these funds is made by completing the Financial Aid Application process outlined previously in this section. Funding is limited and awarded on a first come - first served basis.

Additional Sources of Aid
The University also administers a variety of private scholarship and loan programs for students who demonstrate financial need and/or meet the guidelines set forth by the benefactor. Students who complete the required TJU financial aid application process will be considered for the programs for which they meet the eligibility criteria. The number of recipients and the amount awarded will be determined by the level of available funding. The list of sources includes:

- Thomas Jefferson University Alumni Scholarship – provides grant assistance to financially needy students in all programs of study
- Dean’s Scholarship Program – provides $5,000 - $7,500 scholarship assistance for outstanding academic performance and potential for excellence in a health profession. Selection will be made by the Dean’s Scholarship Committee upon admission.
- Development Office Loan – provides loan assistance to financially needy students in all programs of study
- William Randolph Hearst Scholarship for Minority Students* – awarded to a minority student who exhibits high academic achievement and demonstrates financial need. Sponsored by the Hearst Foundation
- Hamilton-New Jersey Student Aid Fund – provides scholarship and/or loan assistance to needy students in all programs of study. Preference is given to New Jersey residents
- Mrs. Samuel M.V. Hamilton Student Aid Fund – provides scholarship and/or loan assistance to a needy student. A New Jersey resident from any program of study is eligible for consideration
- James M. Large Fund – Low interest loan support for financially disadvantaged students
- McGovern Fund – provides assistance to financially needy students in all programs of study
- Medical Technology Loan – provides low interest loans to junior or senior students enrolled in the Medical Technology Program. Students must also demonstrate financial need to qualify for the loan.
• Stanley & Audrey Merves Scholarship – provides grant assistance to students enrolled in any program. The recipients must be able to demonstrate need and high scholastic ability and be a resident of Philadelphia, Montgomery, Bucks or Chester County.
• Isabel Miley McAlister Occupational Therapy Scholarship – provides assistance to financially needy Occupational Therapy students
• Fox Scholarship for the Advancement of Geriatric Physical Therapy*
• Fox Scholarship for the Advancement of Geriatric Occupational Therapy in Memory of Margaret Sood*
• PNC Bank Loan Fund – provides loan assistance to financially needy students in all programs of study
• Christopher Rivera Scholarship – provides assistance to Physical Therapy students in need
• Samuel and Lois Wolf Scholarship – provides assistance to financially needy students in all programs of study
• Achieve Physical Therapy and Fitness Scholarship* – Provides assistance to a DPT student with need, academic merit and community involvement
• Ethel Beard Burstein Scholarship Fund* – provides assistance to financially needy Occupational Therapy students from Philadelphia who plan to work as a Registered Occupational Therapist in a clinical setting for at least two years following graduation
• Joseph J. Darby Memorial Scholarship Fund - scholarship assistance for a student in Radiologic Sciences
• Joann M. Ludwig ’67 Scholarship – scholarship assistance for Radiologic Sciences students who demonstrate financial need
*Denotes that a specific application and/or additional requirements are necessary for those funds. Contact the University Office of Financial Aid for details.

OTHER POSSIBILITIES
In addition to programs of aid previously described, financial assistance may be obtained from a wide variety of sources. Since application procedures and requirements differ greatly, it is not possible to provide specific information. In general, the student seeking potential sources of aid should refer to: 1) the University Office of Financial Aid webpage; 2) library publications; 3) parents’ employers or labor unions; 4) fraternal, social, religious or professional organizations; 5) major organizations utilizing the skills of the field for which the student is preparing and 6) the Worldwide Web. Students should investigate all sources of financial aid for which they may be eligible. The University Office of Financial Aid will provide assistance in completing any of these applications. The University Office of Financial Aid webpage also includes information on outside scholarship programs. Students may view this information under the Financial Aid Programs menu at www.jefferson.edu/financial_aid.

SATISFACTORY ACADEMIC PROGRESS POLICY FEDERAL TITLE IV PROGRAMS
The Satisfactory Academic Progress Policy may be found in the Jefferson College of Health Professions Student Handbook.
INQUIRIES
Students who have additional questions or problems or who wish to schedule an appointment with a financial aid officer can write or call:

University Office of Financial Aid, Thomas Jefferson University
Suite 115, Curtis Building
1015 Walnut Street
Philadelphia, PA 19107
(215) 955-2867
Financial.aid@jefferson.edu
www.jefferson.edu/financial_aid

Office hours are 8:30 a.m. to 5:00 p.m., Monday through Friday.

Thomas Jefferson University reserves the right to amend any information herein without prior notice to persons who might thereby be affected. Financial aid programs described herein are subject to change without notice due to federal, state, local or institutional regulations or funding.
JCHP Academic Departments
Couple and Family Therapy
DEPARTMENT OF COUPLE AND FAMILY THERAPY
MISSION
The Department of Couple and Family Therapy has as its mission preparing students to enter the profession of marriage and family therapy as highly qualified entry-level professionals, whose clinical work is well grounded in the theoretical models, the empirical findings and the ethical guidelines of the field. The goals of the faculty are to teach students the skills to be life-long learners, able to evaluate and incorporate new developments in the field; to prepare them to be able to practice competently with diverse clinical and cultural populations; to have them evolve strong professional identities; and to develop the self-awareness necessary to critically assess their relationships with clients throughout their careers. Graduates of the program will be prepared to provide state of the art treatment, to collaborate with other health care professionals and to assume leadership roles in the evolving health care environment.

PROGRAM ACCREDITATION
The Couple and Family Therapy Department’s Master of Family Therapy program is accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE).

Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE)
112 South Alfred Street
Alexandria, VA 22314
(703) 838-9808
(703) 838-9805 (FAX)
https://www.aamft.org

ELIGIBILITY FOR LICENSURE
Eligibility for licensure is determined on a state by state basis and students are encouraged to communicate with the state licensing board in the state in which they intend to practice to determine eligibility requirements. The curriculum of The Couple and Family Therapy Department at Thomas Jefferson University was designed to meet the academic requirements of all state licensing boards at the time of its design. Additional post-graduate clinical and supervision hours are usually required for licensing. The Pennsylvania State Board of Social Workers, Marriage and Family Therapists and Professional Counselors can be contacted at P. O. Box 2469, Harrisburg, PA 17105-2649 or on-line at www.ST-SOCIALWORK@state.pa.us. Information on other states’ requirements can be found at the American Marriage and Family Therapy Regulatory Board’s website www.amftrb.org.

The Couple and Family Therapy Program at Thomas Jefferson University
The Couple and Family Therapy Program is a full-time, two year, 66 credit program that culminates in the awarding of a Master in Family Therapy degree (MFT). The curriculum is modeled on the core curriculum developed by the Committee on Education of the American Association of Marital and Family Therapy focusing on key areas of contemporary practice including: couple and marital intervention; family development; family therapy with children; families in transition (divorce and remarriage); family violence; medical family therapy; diversity issues; sex therapy; and research in couple and family therapy. The program offers two tracks: the couple and family therapy track and the sex therapy track, which students declare at the end of their first year.
## CURRICULUM: MASTER'S IN FAMILY THERAPY PROGRAM

### First Year

<table>
<thead>
<tr>
<th>Fall semester</th>
<th>Credits</th>
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<tr>
<td>CFTP 501</td>
<td>Theory and Practice of Family Therapy I</td>
</tr>
<tr>
<td>CFTP 503</td>
<td>Theory and Practice of Couple Therapy</td>
</tr>
<tr>
<td>CFTP 509</td>
<td>Foundations of Systemic Practice</td>
</tr>
<tr>
<td>CFTP 505</td>
<td>Life Span Development from a Systemic Perspective</td>
</tr>
<tr>
<td>CFTP 506</td>
<td>Practicum I</td>
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<td>CFTP 502</td>
<td>Theory and Practice of Family Therapy II</td>
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<tr>
<td>CFTP 504</td>
<td>Assessment in Couple and Family Therapy</td>
</tr>
<tr>
<td>CFTP 510</td>
<td>Psychopathology in Socio-Cultural Context</td>
</tr>
<tr>
<td>CFTP 511</td>
<td>Introduction to Sex Therapy: Concepts in Human Sexuality</td>
</tr>
<tr>
<td>CFTP 507</td>
<td>Practicum II</td>
</tr>
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Students will elect to apply to either the Sex Therapy Track or the Family Therapy Track at the end of the first year.

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<tr>
<td>CFTP 512</td>
<td>Live Supervision I</td>
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<tr>
<td>CFTP 508</td>
<td>Practicum III</td>
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### Second Year

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<tr>
<td>CFTP 601</td>
<td>Implications for Diversity in Practice</td>
</tr>
<tr>
<td>CFTP 602</td>
<td>Research in Couple and Family Therapy</td>
</tr>
<tr>
<td>CFTP 606</td>
<td>Live Supervision II</td>
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<tr>
<td>CFTP 607</td>
<td>Practicum IV</td>
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<td>(one of these two to be selected depending upon student’s track)</td>
</tr>
<tr>
<td></td>
<td>• CFTP 603 Advanced Sex Therapy (Sex Therapy Track)</td>
</tr>
<tr>
<td></td>
<td>• CFTP 605 Issues of Violence and Abuse in the Family (Family Therapy Track)</td>
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</table>

<table>
<thead>
<tr>
<th>Spring semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CFTP 610</td>
<td>Professional, Ethical and Legal Issues in Couple and Family Therapy</td>
</tr>
<tr>
<td>CFTP 612</td>
<td>Families in Transition</td>
</tr>
<tr>
<td>CFTP 613</td>
<td>Master’s Project</td>
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<td>CFTP 608</td>
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<td>(one of these two to be selected depending upon student’s track):</td>
</tr>
<tr>
<td></td>
<td>• CFTP 604 Advanced Sex Therapy (Sex Therapy Track)</td>
</tr>
<tr>
<td></td>
<td>• CFTP 611 Medical Family Therapy (Family Therapy Track)</td>
</tr>
</tbody>
</table>
**Summer semester**

*Continuation of Practicum V, if needed.*

*As it is impossible to predict how a student’s caseload will fill over the course of the program, students may be required to complete Practicum V through the summer (June through August) of their second year. Until students complete the requisite 500 clinical hours, students will receive a grade of Incomplete in Practicum V.

**DEPARTMENT OF COUPLE AND FAMILY THERAPY FACULTY**

Kenneth W. Covelman, PhD*
   Chair

George James, PsyD, LMFT*
   Program Director

Sara J. Corse, PhD

Rita DeMaria, PhD, LMFT*

Wanda Sevey, MDiv, LMFT

Kenneth Maguire, PsyD

Michele M. Marsh, PhD

Diane Logan Thompson, PhD*

Stephen R. Treat, DMin, LMFT*

William F. Coffey, LCSW

Priscilla F. Singleton, LCSW, LMFT*

*American Association of Marriage and Family (AAMFT) Approved Supervisor

**DEPARTMENT OF COUPLE AND FAMILY THERAPY STAFF**

Nicole Brown, MFT
   Administrative Assistant

**DEPARTMENT OF COUPLE AND FAMILY THERAPY CONTACT INFORMATION**

Thomas Jefferson University
Jefferson College of Health Professions
Department of Couple and Family Therapy
130 S. Ninth Street, Suite 530
Philadelphia, PA 19107
DEPARTMENT OF COUPLE AND FAMILY THERAPY COURSE DESCRIPTIONS
Courses are described in numerical order. The number within the parentheses following the course title indicates the number of semester credits assigned to each course.

COUPLE AND FAMILY THERAPY 501
The Theory and Practice of Family Therapy I (3)
This course covers the major early theories of family therapy (Bowenian, structural, strategic, interactional, object-relations, symbolic-experiential) and places them in historical perspective. Umbrella concepts related to theories of change, family development, self in context, the nature of therapeutic reality and the therapist’s use of self will be addressed. Issues of gender, power, sexual orientation and ethnicity in the clinical context will be explored, along with application of the theories to specific clinical problems.

COUPLE AND FAMILY THERAPY 502
The Theory and Practice of Family Therapy II (3)
This course covers major recent developments in the field of family therapy including social constructionism, post-modernism, the feminist critique of family therapy and the emphasis on language based systems. Newer theories such as narrative therapy, solution focused therapy, feminist therapy, paradoxical therapy and collaborative language systems will be reviewed. Clinical applications of these theories will be addressed along with issues of diversity, power, gender and sexual orientation class and ethnicity.

COUPLE AND FAMILY THERAPY 503
Foundations of Systemic Practice (3)
This course will introduce students to the theoretical and epistemological ideas basic to the field of couple and family therapy. It will examine how concepts from general systems theory, cybernetics and communication theory inform clinical practice. It will also introduce students to basic skills and concepts necessary to initiate therapy with families and couples such as conducting the first interview, framing the presenting problem, developing an initial assessment and treatment contract.

COUPLE AND FAMILY THERAPY 504
Psychopathology in Social Context (3)
This course familiarizes the student with the major areas of psychopathology from a biopsychosocial perspective. It will review the DSM-IV and the emerging DSM-V classification of mental disorders as a basis for a more complete assessment, understanding and treatment of couples and families. The reciprocal impact of individual psychopathology and couple and family functioning will be examined along with issues of cultural context and deviancy, power and class.

COUPLE AND FAMILY THERAPY 505
Life Span Development from a Systemic Perspective (3)
This course explores the dynamic interaction of the family life cycle and child and adult development. It orients the student to the concept of family life cycle changes and their impact on individual, couple, and family functioning. The course also familiarizes students to the effect of issues of race, gender, ethnicity, sexual orientation, and culture on the family life cycle.
COUPLE AND FAMILY THERAPY 506
Practicum I (3)
Practicum I is a clinical experience during which students develop foundational clinical skills, professional attitudes and ethical awareness in systems oriented individual, couple and family therapy. Focus will be on forming the therapeutic system, contracting, couple and family assessment, clinical record keeping, the therapeutic alliance and the initial stages of couple and family therapy. Practica will be conducted at various clinical sites and require students to provide their own transportation.

COUPLE AND FAMILY THERAPY 507
Practicum II (3)
Practicum II is a continuation of Practicum I.

COUPLE AND FAMILY THERAPY 508
Practicum III (3)
Practicum III is a continuation of Practicum II.

COUPLE AND FAMILY THERAPY 509
Theory and Practice of Couple Therapy (3)
This course covers the history and practice of couple therapy. Major theoretical models of couple therapy will be reviewed including Bowenian, Structural, Object Relations, Cognitive-Behavioral, Strategic, Psychodynamic, Emotionally Focused and Contextual. Focus will be on the fundamentals of working therapeutically with couples including couples dynamics, intervention strategies and methods of facilitating growth and change. Particular emphasis will be placed on distinguishing content and process in couple therapy and the role of the therapist in creating a therapeutic context. Issues of therapeutic balance, power, reactivity, gender, privilege and ethnicity will be explored along with application theoretical models to specific clinical problems such as affairs, communication, intimacy issues, chronic conflict and jealousy.

COUPLE AND FAMILY THERAPY 510
Assessment in Couple and Family Therapy (3)
This course explores direct and indirect and both qualitative and quantitative methods of assessment. Self-report and observational approaches are considered. The value of ongoing assessment throughout the course of therapy is highlighted. The relevance of age, race, culture and gender to the assessment process is reviewed. The course gives students an understanding of the relationship between a thorough assessment and direct clinical intervention. Students will integrate assessment into practice through experiential exercises, role plays, case presentations, discussions, and videotapes.

COUPLE AND FAMILY THERAPY 511
Introduction to Sex Therapy: Concepts in Human Sexuality (3)
This course explores essential concepts of sexuality by examining the basic theory, research and practice regarding sexual issues for which clients seek understanding and treatment. Topics include the history of sexology, sexual and reproductive anatomy and physiology, sexually transmitted infections and safer sex practices, sexual trauma, sexual compulsive behaviors, sexual orientation, atypical sexual behaviors, gender, religion, chronic illness, social-cultural issues and sexual feelings in clinical practice. Students will explore personal attitudes, values and emotions as they relate to course material. This course will also include a mandatory one day Sexual Attitude/Values training experience.
COUPLE AND FAMILY THERAPY 512
Live Supervision I (3)
This is an advanced clinical seminar that allows students to experience supervisory input while actually conducting therapy with the use of a one-way mirror. Students also will function as part of a clinical team observing, hypothesizing and developing interventions behind the mirror. The history, theory and rules of live supervision will be discussed. The use of self in the process of change and person of the therapist issues will be examined. This seminar will focus on the early phases of therapy.

COUPLE AND FAMILY THERAPY 601
Implications of Diversity for Clinical Practice (3)
This course will help students develop awareness and sensitivity to diversity issues as they influence assessment and treatment of individuals, couples and families within a socio-cultural context. Students will develop an understanding of discrimination and prejudice in areas of age, culture, ethnicity, gender, race, health/ability, spirituality, sexual orientation and socioeconomic status. Students will be encouraged to explore biases, stereotypes and their own values. This course will highlight the strengths of diverse family structures and explore how to use them as therapeutic resources.

COUPLE AND FAMILY THERAPY 602
Research in Couple and Family Therapy (3)
This course will prepare the student to evaluate research findings and formulate research questions and methods of exploration in the field of couple and family therapy. The role of theory, research design, and the use of qualitative and quantitative methods, data collection and data analysis will be emphasized. The role of research in advancing systemic theory and practice will be addressed. Students will be helped to develop a preliminary draft of their master’s project in the second half of the course.

COUPLE AND FAMILY THERAPY 603
Advanced Sex Therapy Training I (Sex Therapy Track) (3)
This course builds on the introductory course and offers advanced understanding of assessment, diagnosis and treatment models for sex therapy practitioners. Students will learn and engage in the practice of these therapeutic modalities throughout the course. Specific attention will be paid to learning the techniques of sex-related assessment, diagnosis and treatment of the psychosexual disorders as described in the current edition of the DSM. Theory and methods of both psychological and medical interventions will be explored. This course will include a mandatory one day Advanced Sexual Attitude/Values training experience.

COUPLE AND FAMILY THERAPY 604
Advanced Sex Therapy Training II (prerequisite ASTT I) (Sex Therapy Track) (3)
This course is an extension of ASTT-I. It will help students gain greater insight into the field of sex therapy as well as practice the skills learned in the previous courses. The course will include peer group supervision, discussion of current issues in human sexuality, videotape case presentation of the student’s clinical work.

COUPLE AND FAMILY THERAPY 605
Issues of Violence and Abuse in the Family from a Systems Perspective (3)
This course will examine the characteristics and impact of intrafamilial violence and abuse on adults and children. It will focus on the nature and scope of this epidemic problem and review key contributing factors. Issues of gender, power and socioeconomic status will be examined. Sexual, physical and
emotional abuse of adults and children will be discussed. Systems oriented treatment for all family members approaches will be reviewed with an emphasis on accurate assessment and the development of appropriate interventions.

**COUPLE AND FAMILY THERAPY 606**

**Live Supervision II (3)**

A continuation of Live Supervision I (CFTP 512), this is an advanced clinical seminar that allows students to experience supervisory input while actually conducting therapy with the use of a one–way mirror. Students also will function as part of a clinical team observing, hypothesizing and developing interventions behind the mirror. The history, theory and rules of live supervision will be discussed. The use of self in the process of change and person of the therapist issues will be examined. This seminar will focus on the middle and late stages of therapy.

**COUPLE AND FAMILY THERAPY 607**

**Practicum IV (3)**

Practicum IV is an advanced clinical practicum during which students will focus on the integration of clinical theory, assessment techniques, intervention strategies, dealing with resistance, the therapeutic alliance, use of self as an instrument of change, reconstructing, ethical issues, sex therapy techniques and termination issues. Practica are conducted at various clinical sites and require students to provide their own transportation.

**COUPLE AND FAMILY THERAPY 608**

**Practicum V (3)**

Practicum V is a continuation of Practicum IV.

**COUPLE AND FAMILY THERAPY 610**

**Professional, Ethical, and Legal issues in Couple and Family Therapy (3)**

This course introduces students to the professional, ethical and legal issues common to a systems-oriented therapy practice. The impact of the therapist’s personal values and ideological convictions on his/her professional practice will be examined. In addition a thorough review of the AAMFT Code of Ethics and the steps toward clinical membership in the AAMFT, as well as state licensure as a marriage and family therapist will be provided.

**COUPLE AND FAMILY THERAPY 611**

**Medical Family Therapy (3)**

This course will examine the complex interactions between physical illness and family functioning and the clinical interventions that can be utilized in these situations. A review of the empirical findings and theoretical concepts that form the basis of this emerging field will be undertaken. A biopsychosocial framework will be developed for understanding and treating a variety of common clinical problems such as psychosomatic symptoms, coping with chronic illness and chronic pain, grief and end of life issues. Collaboration with other health care providers will be discussed.

**COUPLE AND FAMILY THERAPY 612**

**Families in Transition (3)**

This course will focus on the differential impact of major life cycle transitions, specifically, separation, divorce and remarriage on family members. An overview of the issues and challenges that these families face within a broader cultural context will be discussed. The dynamics of family dissolution and
reorganization will be addressed, along with specific intervention strategies. The course will cover helping families through the separation process, co-parenting counseling, understanding issues relating to loss, the effects of conflict on children’s adjustment, and blended family and step-parenting dynamics, as well as, the impact of the legal system on the family and therapeutic system.

COUPLE AND FAMILY THERAPY 613
Master’s Project (3)
The master’s project is the culmination of the student’s scholarly requirements. Students will develop a scholarly paper demonstrating a mastery of clinical theory in the field of couple and family therapy and the ability to apply that theory in a clinical situation under the direction of a faculty advisor. The project must demonstrate the student’s mastery of the academic area chosen and attempt to integrate his or her clinical interests within a scientific framework. Students will be expected to produce a written work that meets high academic standards and to present his or her work to the program faculty and his or her peers in a supportive learning environment.
Medical Laboratory Sciences and Biotechnology

Biotechnology/Applied Molecular Technologies
Cytotechnology/Cell Sciences
Medical Laboratory Science

Graduate Certificate Programs

Honors Program in Genomic Pathology
Honors Program in Molecular Genetics
DEPARTMENT OF MEDICAL LABORATORY SCIENCES AND BIOTECHNOLOGY
The Department of Medical Laboratory Sciences and Biotechnology (formerly Bioscience Technologies) is a multidisciplinary center for laboratory education, research and practice that offers a variety of professional laboratory programs for full-time students and working practitioners. The Department not only provides specialized laboratory-based education in each of its programs, but also incorporates crosscutting laboratory technologies that span bioscience research and diagnostic applications now and for the future. This combination of specialized and comprehensive education assures that graduates have the scientific, problem solving and creative skills that are needed to keep pace with and influence technology-driven changes in the laboratory industry.

EDUCATIONAL PROGRAMS
In all programs, students attain proficiency in their selected discipline’s laboratory procedures and practices by completing clinical and/or research rotations at the Department’s affiliated laboratories. In addition to preparing students for specialized professional laboratory practice, each program provides an excellent scientific and practical foundation for students who are preparing to enter graduate programs in medicine, the basic sciences or clinical translational research.

Biotechnology/Applied Molecular Technologies program options are designed for students interested in laboratory careers in biomedical research, the pharmaceutical industry, forensic DNA testing or molecular analysis. The program emphasizes hands-on laboratory training in various aspects of biotechnology and molecular biology including recombinant DNA and related techniques, molecular diagnostics, protein purification, characterization and modeling, flow cytometry, cell and tissue culture, and systems biology. Laboratory internships or practicums provide additional in-depth laboratory training in actual working laboratories.

Cytotechnology/Cell Sciences program options are designed for students interested in laboratory diagnostics of cancers and other disorders based on cellular, molecular and immunological analysis of pathologic specimens. It includes training in microscopy, ancillary molecular and immunophenotyping techniques, assistance in surgical and non-invasive procedures for collection and evaluation of abnormal masses and other tissue samples, and making diagnoses in correlation with clinical information. The Program provides students with an extensive array of practical training sites to prepare them for work in hospital-based, commercial and forensic laboratories, pharmaceutical industry and for careers in education and research.

Medical Laboratory Science program options prepare students for careers in a wide range of diagnostic practice settings including hospital, commercial, clinic, pharmaceutical, forensic, public health and research laboratories. Students are well prepared to move into technical specialty, sales, marketing or product development positions. Students acquire a thorough background in the theory, principles and practice of clinical laboratory medicine, followed by application of technical and problem-based methods to the performance of clinical laboratory tests and troubleshooting procedures in clinical practicums. Emphasis on interpretation of automated system analyses and other measurements of health status and disease processes helps students achieve a broad understanding of biochemical life processes.

Graduate Certificate Programs in Clinical Chemistry, Hematology, Immunohematology (Blood Banking), Microbiology and Molecular Biology allow students to concentrate their studies in specific areas of clinical or research laboratory practice. Baccalaureate graduates, laboratory technologists,
research technicians and junior scientists may acquire new skills or update their knowledge for continuing education or job mobility.

**Program Levels Available**

<table>
<thead>
<tr>
<th>Program</th>
<th>Bachelor's Degree</th>
<th>Combined BS/MS</th>
<th>Accelerated Professional Masters</th>
<th>Advanced Masters</th>
<th>Graduate Certificate</th>
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<td>X</td>
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<td>X</td>
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<td>Hematology</td>
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<td>Immunohematology</td>
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<td>X</td>
<td></td>
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<tr>
<td>Microbiology</td>
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<tr>
<td>Molecular Biology</td>
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Baccalaureate programs in Biotechnology/Applied Molecular Technologies, Cytotechnology/Cell Sciences and Medical Laboratory Sciences are offered in two options. For students entering as juniors, the “2+2” option is completed in two academic years of full-time study. For students entering as seniors, the “3+1” option is completed in 12 consecutive months of fulltime study including summer sessions. Upon satisfactory completion of the prescribed baccalaureate “2+2” or “3+1” program curriculum, a Bachelor of Science Degree is granted by the University.

Graduate Certificate programs in Clinical Chemistry, Hematology, Immunohematology (Blood Banking), Microbiology and Molecular Biology are available for students who have already earned a baccalaureate degree. The options are offered in part-time accelerated (three semesters) and part-time extended (five semesters) options. Upon successful completion of one of these graduate-level programs, a certificate is granted by the University, after which students are eligible for certification in these laboratory disciplines.

Master of Science Degree Programs in Bioscience Technologies are offered in entry-level, advanced and professional options. The BSEM entry-level option enables students to qualify for admission to graduate bioscience technologies education at Thomas Jefferson University through a combined BS/MS program. At the conclusion of the program, the BS and MS degrees are awarded by the University.

The advanced MS option allows graduates of BS level laboratory science based programs to customize their graduate programs to meet their educational or practice goals. Students pursuing the advanced MS on a full-time basis can complete the MS degree in as little as two academic semesters.

The accelerated professional master’s program is available to students who have already earned a baccalaureate degree in a major other than those offered by the Department of Medical Laboratory Sciences and Biotechnology (Biotechnology, Cytotechnology, Medical Laboratory Science). This accelerated graduate program is completed in 12 consecutive months of full-time study including summer sessions.
At the conclusion of the advanced or professional program, the Master of Science degree is awarded by the University.

PROGRAM ACCREDITATION
The Biotechnology/Applied Molecular Technologies Programs are approved by the University Administration. The programs in Cytotechnology/Cell Sciences are approved by the University Administration and are fully accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) in collaboration with the American Society of Cytopathology. The programs in Medical Laboratory Science are approved by the University Administration and are fully accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Graduate Certificate programs are conducted under the auspices of the programs in Medical Laboratory Science and Biotechnology.

Contact information for the Accreditation bodies is as follows:

Cytotechnology Program
Commission on Accreditation of Allied Health Education Programs (CAAHEP), in collaboration with the Cytotechnology Programs Review Committee of the American Society of Cytopathology
CAAHEP
1361 Park Street
Clearwater, FL 33756
(727) 210-2350
(727) 210-2354 (fax)
www.caahep.org

Medical Laboratory Science Programs
National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
5600 North River Road, Suite 720
Rosemont, IL 60018-5119
(847) 939-3597
(773) 714-8880
(773) 714-8886 (FAX)
www.naacls.org

ELIGIBILITY FOR CERTIFICATION
National certification is proof that a required level of knowledge and competence in the field has been attained. Employers seek certified individuals because they know that people with professional credentials can be counted on for the value-added expertise that is in such high demand today. Certification is also a measurable benchmark for outcomes assessment of student and program performance, the evaluation of which is required by accreditation agencies. Department of Medical Laboratory Sciences and Biotechnology faculty expect all program graduates to sit for their respective certification examinations immediately upon graduation.

With additional laboratory work experience, Biotechnology graduates are eligible for the examination in molecular biology offered by the Board of Certification of the American Society for Clinical Pathology. Successful examinees may use MB(ASCP) after their names.
Cytotechnology graduates are eligible to take the Cytotechnology Certification Examination of the Board of Certification of the American Society for Clinical Pathology. Successful examinees may use CT(ASCP) after their names.

Medical Laboratory Science graduates are eligible to take the Medical Laboratory Scientist (MLS) examination of the Board of Certification of the American Society for Clinical Pathology. Successful examinees may use MLS(ASCP) after their names.

Cytotechnology and Medical Laboratory Science graduates may apply for and take the MB(ASCP) examination as soon as they pass their CT or MLS certification exam.

In addition, through a combination of academic preparation in our programs and work experience, graduates of Medical Laboratory Sciences and Biotechnology programs may prepare for specialty qualifications or certifications in cytometry, immunohistochemistry, laboratory informatics and other specialty areas of laboratory practice.

Individuals who complete a Graduate Certificate program are eligible for certification in their respective laboratory discipline. Certification is from the American Society for Clinical Pathology (ASCP). Once certified, individuals may use these designations following their names: C(ASCP) for Clinical Chemistry; BB(ASCP) for Blood Banking/Immunohematology; M(ASCP) for Microbiology; and H(ASCP) for Hematology. If not previously certified as a technologist (MT/MLS, CG, CT, HTL, BB, C, H, I or M) or specialist (SBB, SC, SCT, SH, SI, SM or SV), certification in Molecular Biology MB(ASCP) requires additional practical experience for exam eligibility.

CORE CURRICULUM
Courses labeled Laboratory Sciences (LS) are designated as Departmental Core Curriculum courses and are offered on a required or elective basis to students in all programs. Core courses contain knowledge, skills and competencies applicable to all laboratory disciplines including fundamental laboratory techniques, laboratory quality management and regulatory procedures, bioinformatics, communications, scientific writing, basic science research skills, health services research methods, mechanisms of disease and education principles. These courses allow students to gain a broad perspective of the laboratory fields as integral components of the larger healthcare delivery system.

BIOSCIENCE HONORS PROGRAMS
In collaboration with the Sidney Kimmel Medical College’s Department of Pathology, Anatomy & Cell Biology and the clinical laboratories of Jefferson Health, we offer unique opportunities in expanding, high-tech areas of pathology laboratory practice to students enrolled in the Department’s programs. The Bioscience Honors Programs will enable exceptional students to earn Honors Certificates in Molecular Genetics and/or Genomic Pathology. Depending on the student’s program, courses included in these certificate programs may be part of the student’s curriculum. In other cases, a student may be required to take additional coursework outside his/her curriculum. Upon completion of the Honors Program, the student will be presented with an “Honors Certificate in Molecular Genetics” or an "Honors Certificate on Genomic Pathology” conferred jointly by the Departments of Medical Laboratory Sciences and Biotechnology and Pathology, Anatomy & Cell Biology. The Honors designation will be part of the student's permanent academic record.
UNDERGRADUATE DEGREE PROGRAMS

BIOTECHNOLOGY/ APPLIED MOLECULAR TECHNOLOGIES
Biotechnology uses knowledge obtained about organisms at the molecular level to inform diagnostic and therapeutic decisions and help solve environmental issues. Biotechnology integrates biochemistry, microbiology, immunology, genetics, cell and tissue culture, physiology and engineering sciences to develop insights, techniques and products that advance our understanding of biological structures and processes. Biotechnology is essential to progress in medicine and drug development; agriculture, forestry, wildlife management, and the environment; forensic investigations, and the fight against bioterrorism. Jefferson’s programs in Biotechnology/Applied Molecular Technologies prepare students to work in a wide variety of biotechnology-related settings. The program emphasizes hands-on training and practical experience, while providing a solid foundation in the basic subjects from which biotechnology evolved. Faculty from academia and industry give students a broad perspective of biotechnology’s applications and possibilities. Graduates are uniquely positioned to begin research laboratory careers in academia, the pharmaceutical industry, public health, forensics, agriculture or bioprocessing. Graduates are also well-positioned to pursue further education in medical, veterinary or basic science doctoral programs.

Curriculum – Biotechnology/Applied Molecular Technologies
Baccalaureate Degree Program
(Full-time, 2-year “2+2” option for students entering as juniors)

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>FALL SEMESTER Semester Credits</th>
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<tr>
<td>LS 301 Molecular Biology</td>
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<tr>
<td>LS 303 Fundamental Clinical and Experimental Techniques</td>
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<td>BT 405 Microbial Genetics</td>
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<tr>
<td>LS 440 Current Research in the Biosciences</td>
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<tr>
<td>BT 320 Cell and Tissue Culture</td>
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<td>BT 403 Human Genetics</td>
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<td>BT 410 Molecular Diagnostic Techniques</td>
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<tr>
<td>BT 411 Protein Purification and Characterization</td>
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<th>Senior Year</th>
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<td>SUMMER I</td>
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<tr>
<td>LS 430 Laboratory Standards and Practices</td>
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**FALL SEMESTER**
- LS 311 Functional Histology 2
- BT 412 Biotechnology Practicum I 4
- BT 422 Biotechnology Practicum II 4
- MT 331 Immunology 3
- HCA 300 Healthcare Delivery in America 3

**SPRING SEMESTER**
- LS 416 Comprehensive Examination 1
- LS 413 Pathology 2
- BT 401 Systems Biology 2
- BT 432 Biotechnology Practicum III 4
- BT 442 Biotechnology Practicum IV 4

**Credit Summary**
- Credits Required for Admission 55
- Credits for Junior Year 33
- Credits for Senior Year 32

**Total Credits for Bachelor of Science Degree - “2+2” option (Biotechnology/Molecular Sciences) 120**

**Curriculum – Biotechnology / Applied Molecular Technologies**

**Baccalaureate Program (“3+1” option for students entering as seniors)**

**(Full-time one-year option, 12 consecutive months)**

**FALL SEMESTER**
- LS 301 Molecular Biology 3
- LS 303 Fundamental Clinical and Experimental Techniques 3
- BT 303 Molecular Preparatory Techniques 1
- BT 310 Basic Molecular Techniques 4
- BT 405 Microbial Genetics 3
- CHEM 304 Biochemistry 3
- MT 331 Immunology 3

**SPRING SEMESTER**
- LS 413 Pathology 2
- LS 440 Current Research in the Biosciences 2
- BT 320 Cell and Tissue Culture Techniques 4
- BT 401 Systems Biology 2
- BT 403 Human Genetics 3
- BT 410 Molecular Diagnostic Techniques 4
- BT 411 Protein Purification and Characterization 3
SUMMER SESSIONS I & II
LS 416    Comprehensive Examination  1
LS 430    Laboratory Standards and Practices  3
BT 412    Biotechnology Practicum I  4
BT 422    Biotechnology Practicum II  4
BT 432    Biotechnology Practicum III  4
BT 442    Biotechnology Practicum IV  4

Credit Summary for 3+1 Baccalaureate Degree Option
Credits Required for Admission  70
Credits for Senior Year  60
Total Credits for Bachelor of Science Degree -
“3+1” option (Biotechnology/Applied Molecular Technologies)  130

Descriptions for courses listed above are found at the end of this section and are entitled “Course Descriptions.” Courses with prefixes other than LS, BT, MT, or CHEM are described in the Department of Professional and Continuing Studies section of the JCHP Course Catalog.

CYTOTECHNOLOGY/CELL SCIENCES
Cytotechnologists are laboratory scientists whose work focuses on the examination of cellular pathologic specimens to detect the presence of infectious, inflammatory, neoplastic and therapy-related conditions. Using microscopy, automated cell analysis systems, immunochemistry, and molecular technologies, Cytotechnologists visualize, locate, interpret and diagnose normal and abnormal cells, cellular patterns and tissue architecture from different body sites. Cytotechnologists perform a significant service in the prevention and control of a variety of diseases including cancers and provide extensive supportive information that helps in identifying those who need further follow up and treatment. They are experts in diagnosing cancer at its earliest and potentially most curable stages. Based on microscopic examination of gynecologic specimens ("Pap Tests"), cytotechnologists identify the presence or absence of cancerous and pre-cancerous cells. Cytotechnologists issue final reports on negative tests. When abnormal cells are detected, cytotechnologists prepare a preliminary diagnosis that is then reviewed with a pathologist.

Cytologic evaluation of other body systems, such as the respiratory and gastrointestinal tracts, lymph nodes and other organs provides diagnostic information that helps in identifying pathologic conditions while minimizing the need for extensive surgical procedures. Cytotechnologists work independently at their microscopes, but also work collaboratively with pathologists, radiologists, oncologists and other medical specialists. Their daily routine includes major problem-solving and decision-making activities. Cytotechnologists assist in the collection of fine needle aspiration specimens from patients using ultrasound, CT scanning or endoscopic techniques and participate in diagnostic evaluation of the acquired aspirates. They also select appropriate preparation and staining methods for cytologic specimens and supervise “cytoprep” technicians, monitor and document quality assurance procedures, or conduct research in laboratory standards and best practices. They are responsible for recommending and performing ancillary tests (such as immunocytochemistry, fluorescent molecular diagnostic probes or special staining tests) that yield highly specific diagnoses to direct and personalize treatment decisions for patients and their physicians.

Students enrolled in Cytotechnology/Cell Sciences programs are prepared in the contemporary theoretical and practical aspects of the field as well as in the technologies that will shape future
diagnostic practice. They can confidently pursue careers as highly qualified healthcare professionals and participants in health service teams, or continue with medical, dental, veterinary or basic science education at the doctoral level.

The goal of the Cytotechnology/Cell Sciences programs is to prepare competent entry-level Cytotechnologists/Cell Scientists in the cognitive (knowledge), psychomotor (skills), and affective (behavioral) learning domains, such that graduates are prepared to perform, respond to or initiate and influence change in the skill sets and knowledge base required for contemporary and future laboratory practice.

**Curriculum – Cytotechnology/Cell Sciences**
**Baccalaureate Degree Program (Full-time, 2-year “2+2” option for students entering as juniors)**

**Junior Year**
**FALL SEMESTER**
- LS 301 Molecular Biology 3
- LS 303 Fundamental Clinical and Experimental Techniques 3
- LS 311 Functional Histology 2
- CT 301 Principles of Cell Analysis 2
- CT 311 Gynecologic Cytology and Histocorrelations 5
- CT 312 Gynecologic Cytology and Histocorrelations Laboratory 3

**SPRING SEMESTER**
- LS 413 Pathology 2
- CT 307 Cellular and Molecular Laboratory Techniques 4
- CT 315 Nongynecologic Cytology and Histocorrelations I 4
- CT 317 Nongynecologic Cytology and Histocorrelations II 4

**Senior Year**
**SUMMER I**
- LS 430 Laboratory Standards and Practices 3

**FALL SEMESTER**
- LS 498 Special Topics in Laboratory Science 2
- CT 412 Cytotechnology Practicum I 4
- CT 413 Cytotechnology Practicum II 4
- CH 304 Biochemistry 3
- HCA 300 Healthcare Delivery in America 3

**SPRING SEMESTER**
- LS 416 Comprehensive Examination 1
- LS 440 Current Research in the Biosciences 2
- CT 325 Cellular and Molecular and ImmunoDiagnostics 3
- CT 414 Cytotechnology Practicum III 4
- CT 415 Cytotechnology Practicum IV 4
Credit Summary

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<tr>
<td>Credits for Senior Year</td>
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Total Credits for Bachelor of Science Degree -
“2+2” Option (Cytotechnology/Cell Sciences)  120

Descriptions for courses listed above are found at the end of this section and are entitled “Course Descriptions.” Courses with prefixes other than CT, LS or CHEM are described in the Department of Professional and Continuing Studies section of the JCHP Course Catalog.

Curriculum – Cytotechnology/Cell Sciences
Baccalaureate Program (“3+1” option for students entering as seniors)
(Full-time one-year option, 12 consecutive months)

FALL SEMESTER

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<td>Principles of Cell Analysis 2</td>
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<td>CHEM 304</td>
<td>Biochemistry 3</td>
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SPRING SEMESTER

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<td>LS 413</td>
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<td>CT 307</td>
<td>Cellular and Molecular Laboratory Techniques 4</td>
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<td>CT 325</td>
<td>Cellular and Molecular and ImmunoDiagnostics 3</td>
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SUMMER SESSIONS I & II

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<td>LS 430</td>
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<td>Cytotechnology Practicum III 4</td>
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<tr>
<td>CT 415</td>
<td>Cytotechnology Practicum IV 4</td>
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Credit Summary for 3+1 Baccalaureate Degree Option

<table>
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</thead>
<tbody>
<tr>
<td>Credits for Senior Year</td>
<td>60</td>
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</table>

Total Credits for Bachelor of Science Degree -
“3+1” Option (Cytotechnology/Cell Sciences)  130
MEDICAL LABORATORY SCIENCE

Medical Laboratory Scientists are skilled professionals who perform chemical, hematological, immunological, microscopic and microbiological tests for the interpretation and monitoring of diseases. These may include chemical tests to determine a patient’s blood glucose or cholesterol level or examination of patient samples to detect the presence of bacteria, fungi, parasites, viruses or other disorders. They type and cross-match blood samples for transfusions, perform analyses for chemicals and toxins, and test samples for antibiotic sensitivities and immune response. They integrate and apply concepts of biology, chemistry and informatics to produce valid and reliable patient test results. Test results, in turn, provide other health professionals with information that is crucial for the diagnosis of diseases, management of patient therapy and maintenance of health. Medical Laboratory Scientists occupy responsible and respected positions in hospital, commercial, public health, research and pharmaceutical laboratories, as well as in sales, management and education.

The mission of the Medical Laboratory Science Programs is to prepare outstanding medical laboratory scientists who will provide team-based, quality care to and for patients, and who will advance the medical laboratory science profession. This mission is accomplished by assuring that graduates demonstrate (1) a firm foundation in the medical laboratory sciences with emphasis on accurate and efficient test interpretation; (2) utilization of instrumentation to assure quality; (3) problem-solving skills that enable correlation of theory and practice so that they are able to keep abreast of developments in the field and to contribute to them; (4) a commitment to continual learning throughout one’s professional career; and (5) an educational foundation suitable for continuing graduate study.

Curriculum – Medical Laboratory Science
Baccalaureate Degree Program
(Full-time, 2-year “2+2” option for students entering as juniors)

<table>
<thead>
<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>FALL SEMESTER</td>
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<tr>
<td>LS 303</td>
<td>Fundamental Clinical and Experimental Techniques</td>
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<td>MT 312</td>
<td>Microbiology I</td>
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<td>MT 323</td>
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<td>MT 331</td>
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<tr>
<td>SPRING SEMESTER</td>
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</tr>
<tr>
<td>MT 307</td>
<td>Clinical and Molecular Laboratory Techniques</td>
</tr>
<tr>
<td>MT 313</td>
<td>Microbiology II</td>
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<td>Chemistry II</td>
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<td>MT 343</td>
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<td>MT 352</td>
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**Senior Year**

**SUMMER I**
- LS 430 Laboratory Standards and Practices 3

**FALL SEMESTER**
- LS 301 Molecular Biology 3
- LS 311 Functional Histology 2
- HCA 300 Healthcare Delivery in America 3
- MT 412 Medical Technology Practicum I 4
- MT 422 Medical Technology Practicum II 4

**SPRING SEMESTER**
- LS 413 Pathology 2
- LS 416 Comprehensive Examination 1
- LS 440 Current Research in the Biosciences 2
- MT 442 Medical Technology Practicum III 4
- MT 454 Medical Technology Practicum IV 4

**Credit Summary**

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<td>Credits for Senior Year</td>
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**Total Credits for Bachelor of Science Degree -**

- **“2+2” Option (Medical Laboratory Science)** 120

Descriptions for courses listed above are found in the section entitled “Course Descriptions.” Courses with prefixes other than MT, LS, or CHEM are described in the Department of Professional and Continuing Studies section of the JCHP Course Catalog.

**Curriculum – Medical Laboratory Science**

**Baccalaureate Program (“3+1” option for students entering as seniors)**

**(Full-time one-year option, 12 consecutive months)**

**FALL SEMESTER**

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<tr>
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<td>Fundamental Clinical and Experimental Techniques</td>
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<td>MT 312</td>
<td>Microbiology I</td>
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<td>MT 323</td>
<td>Chemistry I</td>
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<td>MT 331</td>
<td>Immunology</td>
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<td>MT 341</td>
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<td>Biochemistry</td>
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20
SPRING SEMESTER
LS 413 Pathology 2
LS 440 Current Research in the Biosciences 2
MT 307 Clinical and Molecular Laboratory Techniques 4
MT 313 Microbiology II 3
MT 324 Chemistry II 3
MT 343 Hematology II 3
MT 352 Immunohematology 3

SUMMER SESSIONS I & II
LS 416 Comprehensive Examination 1
LS 430 Laboratory Standards and Practices 3
MT 412 Medical Technology Practicum I 4
MT 422 Medical Technology Practicum I 4
MT 442 Medical Technology Practicum III 4
MT 454 Medical Technology Practicum IV 4

Credit Summary for 3+1 Baccalaureate Degree Option
Credits Required for Admission 70
Credits for Senior Year 60
Total Credits for Bachelor of Science Degree-“3+1” Option (Medical Laboratory Science) 130

Descriptions for courses listed above are found in the section entitled “Course Descriptions.” Courses with prefixes other than MT, LS, or CHEM are described in the Department of Professional and Continuing Studies section of the JCHP Course Catalog.

GRADUATE CERTIFICATE PROGRAMS
The Graduate Certificate programs are part-time programs offered as accelerated (three semesters) or extended (five semesters) options.

CLINICAL CHEMISTRY CERTIFICATE PROGRAM
Clinical chemists analyze patients’ blood and body fluids to assess physiological health or disease status. Utilizing state-of-the-art instrumentation to measure enzyme activity, blood gas saturation, and concentrations of drugs and glucose, the clinical chemist determines the biochemical parameters of blood and body fluids to help physicians in the prevention, diagnosis, monitoring and treatment of diseases.

Curriculum – Clinical Chemistry Certificate - Accelerated Option

FALL SEMESTER
Semester Credits
LS 501 Molecular Biology 3
MT 523 Chemistry I 2
MT 531 Immunology 3
8
SPRING SEMESTER
LS 613  Pathology  2
MT 524  Chemistry II  3
MT 507  Clinical and Molecular Laboratory Techniques  4

SUMMER SESSION
LS 610  Regulatory and Fiscal Issues in Laboratory Management  3
LS 812  Practicum (Clinical Chemistry)  2

Curriculum – Clinical Chemistry Certificate - Extended Option

FALL SEMESTER
LS 501  Molecular Biology  3
MT 523  Chemistry I  2

SPRING SEMESTER
MT 507  Clinical and Molecular Laboratory Techniques  4
MT 524  Chemistry II  3

SUMMER SESSION
LS 610  Regulatory and Fiscal Issues in Laboratory Management  3

FALL SEMESTER
MT 531  Immunology  3

SPRING SEMESTER
LS 613  Pathology  2
LS 812  Practicum (Clinical Chemistry)  2

Total Credits for Graduate Certificate in Clinical Chemistry  22

MICROBIOLOGY CERTIFICATE PROGRAM
Microbiologists culture, isolate and identify bacteria, parasites and viruses to diagnose the causes of diseases and determine the appropriate antibiotics needed for treatment. The constant discovery of newly mutated and therapy-resistant organisms, as well as the importance of identifying and neutralizing potential biological attack agents, demonstrates that the role of the microbiologist is becoming increasingly important.

Curriculum –Microbiology Certificate - Accelerated Option

FALL SEMESTER
LS 501  Molecular Biology  3
MT 512  Microbiology I  3
MT 531  Immunology  3

SPRING SEMESTER
LS 613  Pathology  2
LS 812  Practicum (Clinical Chemistry)  2

Total Credits for Graduate Certificate in Microbiology  9

Semester Credits
3
3
3
9
SPRING SEMESTER
LS 613 Pathology 2
MT 507 Clinical and Molecular Laboratory Techniques 4
MT 513 Microbiology II 3

SUMMER SESSION
LS 610 Regulatory and Fiscal Issues in Laboratory Management 3
LS 812 Practicum (Microbiology) 2

Curriculum – Microbiology Certificate - Extended Option

FALL SEMESTER
LS 501 Molecular Biology 3
MT 512 Microbiology I 3

SPRING SEMESTER
MT 507 Clinical and Molecular Laboratory Techniques 4
MT 513 Microbiology II 3

SUMMER SESSION
LS 610 Regulatory and Fiscal Issues in Laboratory Management 3

FALL SEMESTER
MT 531 Immunology 3

SPRING SEMESTER
LS 613 Pathology 2
LS 812 Practicum (Microbiology) 2

Total Credits for Graduate Certificate in Microbiology 23

HEMATOLOGY CERTIFICATE PROGRAM
Hematologists analyze the function and formation of red and white blood cells and other elements of blood and body fluids as well as monitor the components of the coagulation system. By monitoring normal and abnormal cells and assessing concentrations of coagulation factors, the hematologist provides health practitioners with the information necessary to ensure that therapy and treatment are appropriate for each patient.

Curriculum – Hematology Certificate - Accelerated Option

FALL SEMESTER
LS 501 Molecular Biology 3
MT 531 Immunology 3
MT 541 Hematology I 3

Semester Credits
3
3
9

Total Credits for Graduate Certificate in Hematology 9
SPRING SEMESTER
LS 613 Pathology 2
MT 507 Clinical and Molecular Laboratory Techniques 4
MT 543 Hematology II 3

SUMMER SESSION
LS 610 Regulatory and Fiscal Issues in Laboratory Management 3
LS 812 Practicum (Hematology) 2

Curriculum – Hematology Certificate - Extended Option

FALL SEMESTER
LS 501 Molecular Biology 3
MT 531 Immunology 3

SPRING SEMESTER
LS 613 Pathology 2
MT 507 Clinical and Molecular Laboratory Techniques 4

SUMMER SESSION
LS 610 Regulatory and Fiscal Issues in Laboratory Management 3

FALL SEMESTER
MT 541 Hematology I 3

SPRING SEMESTER
MT 543 Hematology II 3
LS 812 Practicum (Hematology) 2

Total Credits for Graduate Certificate in Hematology 23

IMMUNOHEMATOLOGY (BLOOD BANKING) CERTIFICATE PROGRAM
Immunohematology and transfusion medicine are critical areas within clinical blood bank laboratories. Immunohematologists not only type and cross-match blood from donors and recipients, they also analyze specific blood products for the rapidly expanding field of component therapy. As individual blood components become more readily available, whole blood transfusions are used less frequently.

Curriculum – Immunohematology Certificate - Accelerated Option

FALL SEMESTER
LS 501 Molecular Biology 3
MT 531 Immunology 3

SPRING SEMESTER
MT 543 Hematology II 3
LS 812 Practicum (Hematology) 2

Semester Credits

Total Credits for Graduate Certificate in Hematology 23

52
SPRING SEMESTER
LS 613  Pathology 2
MT 507  Clinical and Molecular Laboratory Techniques 4
MT 552  Immunohematology 3

SUMMER SESSION
LS 610  Regulatory and Fiscal Issues in Laboratory Management 3
LS 812  Practicum [Immunohematology/Immunopathology] 2

Curriculum – Immunohematology Certificate - Extended Option

FALL SEMESTER
LS 501  Molecular Biology 3
MT 541  Hematology I 3

SPRING SEMESTER
LS 613  Pathology 2
MT 507  Clinical and Molecular Laboratory Techniques 4

SUMMER SESSION
LS 610  Regulatory and Fiscal Issues in Laboratory Management 3

FALL SEMESTER
MT 531  Immunology 3

SPRING SEMESTER
MT 552  Immunohematology 3
LS 812  Practicum [Immunohematology/Immunopathology] 2

Total Credits for Graduate Certificate in Immunohematology 23

MOLECULAR BIOLOGY CERTIFICATE PROGRAM
Molecular biological techniques have broad applications for identifying genetic diseases and infectious agents or determining paternity. Molecular biologists use a variety of techniques such as DNA/RNA extraction, Southern blot, Western blot, PCR and gene sequencing. These methods are being used more and more in clinical laboratories, diagnostic genetics laboratories, research laboratories and in forensic investigations.

Curriculum – Molecular Biology Certificate - Accelerated Option

FALL SEMESTER
LS 501  Molecular Biology 3
BT 503  Molecular Preparatory Techniques 1
BT 510  Basic Molecular Techniques 4
SPRING SEMESTER
LS 613  Pathology           2
BT 603  Human Genetics      3
BT 610  Molecular Diagnostic Techniques  4
BT 611  Protein Purification and Characterization  3

SUMMER SESSION
LS 812  Practicum [Research Applications]  2
LS 813  Practicum [Clinical Applications]  2
LS 814  Practicum [Forensic Applications]  2

Curriculum – Molecular Biology Certificate - Extended Option

FALL SEMESTER
LS 501  Molecular Biology  3
BT 503  Molecular Preparatory Techniques  1
BT 510  Basic Molecular Techniques  4
  8

SPRING SEMESTER
BT 603  Human Genetics  3
BT 610  Molecular Diagnostic Techniques  4
  7

SUMMER SESSION
LS 812  Practicum [Research Applications]  2

FALL SEMESTER
LS 813  Practicum [Clinical Applications]  2

SPRING SEMESTER
LS 613  Pathology  2
BT 611  Protein Purification and Characterization  3
LS 814  Practicum [Forensic Applications]  2
  7

Total Credits for Graduate Certificate in Molecular Biology 26

GRADUATE DEGREE PROGRAMS

MASTER OF SCIENCE
Clinical and research laboratories develop and utilize increasingly sophisticated technical and information systems to provide accurate and reliable diagnostic and therapeutic products. At the same time, the healthcare climate in which laboratories provide these services necessitates meticulous attention to the integrity of the research process, and to quality assurance including patient outcomes of laboratory testing, regulatory compliance, and human and financial resources management. The laboratory industry seeks individuals who possess these value-added skills in addition to their exceptional technological skills for clinical and research laboratory practice and management. The MS Programs prepare students for positions of leadership in laboratory testing, management and research.
ENTRY-LEVEL COMBINED BS/MS PROGRAM
The entry-level combined BS/MS (or BSEM) Program is designed for students who have not yet received a bachelor’s degree but have completed a minimum of 82 semester credits, including 24 credits in biological and/or chemical sciences. The BS/MS program enables students to qualify for admission to graduate bioscience technology education at Thomas Jefferson University through a combined program that begins each Fall Semester. Students progress through an integrated undergraduate/graduate curriculum. At the conclusion of the program, the BS and MS degrees are awarded.

ACCELERATED PROFESSIONAL MS GRADUATE PROGRAM
This unique 1-year professional master’s program is available for students who have already earned a baccalaureate degree in a non-science or science field other than laboratory sciences/bioscience technologies. The professional master’s graduate program is completed in 12 consecutive months of full-time study, including summer sessions. The program is designed for BS graduates who are interested in the biosciences and who wish to acquire specific sets of technical and managerial competencies that will prepare them for employment in biotech, clinical and/or anatomic pathology laboratories. This accelerated program is ideal for BS graduates looking for a rapid and comprehensive entrance to the laboratory science workforce. For those who are planning a "gap year" before applying to medical or other doctoral programs, this MS program can demonstrate additional academic experience to medical/doctoral admissions offices.

ADVANCED MS GRADUATE PROGRAM
This program is designed to amplify the skills and knowledge base of individuals who have earned a bachelor’s degree or post-baccalaureate certificate in a laboratory science field of Biotechnology, Cytotechnology, Medical Laboratory Science or a related degree-granting field. Management and regulatory strategies, specialized laboratory assignments, and bioscience education methods with practical teaching experiences are significant components of this advanced curriculum. Experiential and elective coursework is customized to meet each student’s unique interests. The Advanced MS Program is offered on a full-time or part-time basis. Following their individualized course sequence, advanced master’s students earn the MS degree at the conclusion of the program.
MASTER’S CONCENTRATION AREAS FOR ENTRY-LEVEL BS/MS AND ADVANCED MS STUDENTS

Students in the Entry-level BS/MS and Advanced MS programs select 7-9 credits of Concentration Electives from available graduate level courses offered throughout the University. Concentration Areas should focus on and reflect contemporary areas of clinical or research laboratory management, administration and advanced practice. Please consult with your faculty advisor for a listing of approved concentration electives.

Concentration Areas for Bioscience Technologies include but are not limited to:
- Management and Supervision
- Financial Management
- Regulatory and Quality Management
- Research Skills

ENTRY-LEVEL COMBINED BS/MS PROGRAMS (UNDERGRADUATE/GRADUATE)

Curriculum – BS/MS (Biotechnology/ Applied Molecular Technologies Option)

Undergraduate Phase

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>Semester Credits</th>
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<tbody>
<tr>
<td>LS 301 Molecular Biology</td>
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<td>LS 303 Fundamental Clinical and Experimental Techniques</td>
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<tr>
<td>CHEM 304 Biochemistry</td>
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<tr>
<td>BT 303 Molecular Preparatory Techniques</td>
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<td>BT 310 Basic Molecular Techniques</td>
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<tr>
<td>BT 405 Microbial Genetics</td>
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<td>MT 331 Immunology</td>
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<tr>
<td>BT 411 Protein Purification and Characterization</td>
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<td>BT 320 Cell and Tissue Culture Techniques</td>
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<tr>
<td>LS 440 Current Research in the Biosciences</td>
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<td>BT 403 Human Genetics</td>
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<td>BT 410 Molecular Diagnostic Techniques</td>
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<td>BT 401 Systems Biology</td>
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Graduate Phase

FALL SEMESTER

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<th>Course</th>
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<tr>
<td>LS 603 Research Design</td>
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<tr>
<td>LS 640 Methods in Bioscience Education</td>
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<tr>
<td>LS 801 Research Project I</td>
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<tr>
<td>LS 813 Practicum II</td>
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<tr>
<td>Concentration Electives</td>
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SPRING SEMESTER
LS 613    Pathology          2
LS 610    Regulatory and Fiscal Issues in Laboratory Management  3
LS 802    Research Project II     2
LS 814    Practicum III          2
LS 815    Practicum IV          2
LS 816    Comprehensive Examination  1
Concentration Elective  3

Credit Summary
Credits Required for Admission  82
Undergraduate Phase Credits  39
Graduate Phase Credits  32

Total Credits for the BS/MS-
Biotechnology/Applied Molecular Technologies Option  153

Curriculum – BS/MS (Cytotechnology/Cell Sciences Option)
Undergraduate Phase

FALL SEMESTER
LS 301    Molecular Biology      3
LS 303    Fundamental Clinical and Experimental Techniques  3
LS 311    Functional Histology   2
CT 301    Principles of Cell Analysis  2
CT 311    Gynecologic Cytology and Histocorrelations  3
CT 312    Gynecologic Cytology and Histocorrelations Laboratory  5
CHEM 304  Biochemistry           3
                           21

SPRING SEMESTER
LS 440    Current Research in the Biosciences  3
CT 307    Cellular and Molecular Laboratory Techniques  4
CT 315    Nongynecologic Cytology and Histocorrelations I  4
CT 317    Nongynecologic Cytology and Histocorrelations II  4
CT 325    Cellular, Molecular and ImmunoDiagnostics   3
                           18

Graduate Phase

FALL SEMESTER
LS 603    Research Design       3
LS 640    Methods in Bioscience Education  3
LS 801    Research Project I    1
LS 812    Practicum I           2
LS 813    Practicum II          2
Concentration Electives   6
                           17
SPRING SEMESTER
LS 610  Regulatory and Fiscal Issues in Laboratory Management  3
LS 613  Pathology  2
LS 802  Research Project II  2
LS 814  Practicum III  2
LS 815  Practicum IV  2
LS 816  Comprehensive Examination  1
Concentration Elective  3

Credit Summary
Credits Required for Admission  82
Undergraduate Phase Credits  39
Graduate Phase Credits  32

Total Credits for the BS/MS-Cytotechnology/Cell Sciences Option  153

Curriculum – BS/MS (Medical Laboratory Science Option)
Undergraduate Phase

FALL SEMESTER
LS 301  Molecular Biology  3
LS 303  Fundamental Clinical and Experimental Techniques  3
CHEM 304  Biochemistry  3
MT 312  Microbiology I  3
MT 323  Chemistry I  2
MT 331  Immunology  3
MT 341  Hematology I  3

SPRING SEMESTER
MT 307  Clinical and Molecular Laboratory Techniques  4
MT 313  Microbiology II  3
MT 324  Chemistry II  3
MT 343  Hematology II  3
MT 352  Immunohematology  3
LS 440  Current Research in the Biosciences  3

Graduate Phase

FALL SEMESTER
Concentration Electives  6
LS 603  Research Design  3
LS 640  Methods in Bioscience Education  3
LS 801  Research Project I  1
LS 812  Practicum I  2
LS 813  Practicum II  2

15
SPRING SEMESTER

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<td>LS 802</td>
<td>Research Project II</td>
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<td>LS 814</td>
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<td>LS 816</td>
<td>Comprehensive Examination</td>
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<td>Concentration Elective</td>
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**Credit Summary**

- Credits Required for Admission: 82
- Undergraduate Phase Credits: 39
- Graduate Phase Credits: 32

**Total Credits for the BS/MS-Medical Laboratory Science Option:** 153

**ACCELERATED PROFESSIONAL MS PROGRAMS (GRADUATE)**

**Curriculum – Prof. MS (Biotechnology/Applied Molecular Technologies Option)**

**FALL SEMESTER**

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<td>Basic Molecular Techniques</td>
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<td>BT 605</td>
<td>Microbial Genetics</td>
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<td>MT 531</td>
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**SPRING SEMESTER**

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<td>Cell and Tissue Culture Techniques</td>
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<td>Human Genetics</td>
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<td>BT 610</td>
<td>Molecular Diagnostic Techniques</td>
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<td>Systems Biology</td>
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**SUMMER I & II**

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<tr>
<td>LS 816</td>
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**Total Credits:** 53
## Curriculum – Professional MS (Cytotechnology/Cell Sciences Option)

<table>
<thead>
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<tbody>
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<td>3</td>
</tr>
<tr>
<td>LS 603</td>
<td>Research Design</td>
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<tr>
<td>LS 511</td>
<td>Functional Histology</td>
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<tr>
<td>CT 501</td>
<td>Principles of Cell Analysis</td>
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</tr>
<tr>
<td>CT 511</td>
<td>Gynecologic Cytology and Histocorrelations</td>
<td>5</td>
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<tr>
<td>CT 512</td>
<td>Gynecologic Cytology and Histocorrelations Laboratory</td>
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<tr>
<td>CHEM 504</td>
<td>Biochemistry</td>
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### FALL SEMESTER (Continued)

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<tbody>
<tr>
<td>CT 511</td>
<td>Gynecologic Cytology and Histocorrelations Laboratory</td>
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### SPRING SEMESTER

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<td>LS 613</td>
<td>Pathology</td>
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<tr>
<td>LS 801</td>
<td>Research Project I</td>
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<tr>
<td>CT 507</td>
<td>Cellular and Molecular Laboratory Techniques</td>
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<tr>
<td>CT 515</td>
<td>Nongynecologic Cytology and Histocorrelations I</td>
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<td>CT 517</td>
<td>Nongynecologic Cytology and Histocorrelations II</td>
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<tr>
<td>CT 525</td>
<td>Cellular, Molecular, and ImmunoDiagnostics</td>
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### SUMMER I & II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credits</th>
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<tbody>
<tr>
<td>LS 610</td>
<td>Regulatory and Fiscal Issues in Laboratory Management</td>
<td>3</td>
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<tr>
<td>LS 812</td>
<td>Practicum I</td>
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<tr>
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### Total Credits

53

## Curriculum – Professional MS (Medical Laboratory Science Option)

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<tr>
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<tr>
<td>LS 501</td>
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<tr>
<td>LS 603</td>
<td>Research Design</td>
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<td>CHEM 504</td>
<td>Biochemistry</td>
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<td>MT 512</td>
<td>Microbiology I</td>
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<td>MT 523</td>
<td>Chemistry I</td>
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<tr>
<td>MT 531</td>
<td>Immunology</td>
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<td>MT 541</td>
<td>Hematology I</td>
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### FALL SEMESTER (Continued)

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<tr>
<td>MT 523</td>
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### Total Credits

20
### SPRING SEMESTER

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<td>MT 507</td>
<td>Clinical and Molecular Laboratory Techniques</td>
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<td>MT 513</td>
<td>Microbiology II</td>
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<td>MT 524</td>
<td>Chemistry II</td>
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<td>MT 543</td>
<td>Hematology II</td>
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<td>MT 552</td>
<td>Immunohematology</td>
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#### SUMMER I & II

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**Total Credits** 19

### ADVANCED MS PROGRAM

#### Curriculum – Full-Time Option

##### FALL SEMESTER

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<td>Methods in Bioscience Education</td>
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<td>Practicum II</td>
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<tr>
<td>*LS 644</td>
<td>Laboratory Education Administration and Instruction</td>
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<td>CHEM 504</td>
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**Total Credits for the Master of Science (Advanced MS)** 17

##### SPRING SEMESTER

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<thead>
<tr>
<th>Course</th>
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<td>LS 613</td>
<td>Pathology</td>
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<td>LS 802</td>
<td>Research Project II</td>
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</tr>
<tr>
<td>LS 814*</td>
<td>Practicum III</td>
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<td>LS 815*</td>
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**Total Credits** 15

**Minimum Total Credits for the Master of Science (Advanced MS)** 32
* Students are provided the option of completing practicum experiences or additional coursework in Laboratory Education Administration and Instruction/Laboratory Administration and Management. The selection of the best course options should be made under advisement of the student’s faculty advisor, with consideration of the student’s professional goals and prior experience.

**Curriculum – Part-Time Option (Suggested)**

**FALL SEMESTER**
- LS 603 Research Design  
- LS 640 Methods in Bioscience Education  
- LS 812* Practicum I  

**SPRING SEMESTER**
- LS 610 Regulatory and Fiscal Issues in Laboratory Management  
- LS 613 Pathology  
- LS 813* Practicum II  
  or  
  *LS 644 Laboratory Education Administration and Instruction  2-4 minimum 7

**SUMMER I and/or II**
- LS 814* Practicum III  
- Concentration Elective  

**FALL SEMESTER**
- LS 801 Research Project I  
- LS 815* Practicum IV  
- CHEM 504 Biochemistry  

**SPRING SEMESTER**
- LS 802 Research Project II  
- Concentration Elective(s)  
  or  
  *LS 645 Laboratory Administration and Management  2-4 minimum 4

**Total Credits for the Master of Science**  
(Advanced MS)  
minimum 32
DEPARTMENT OF MEDICAL LABORATORY SCIENCES AND BIOTECHNOLOGY FACULTY

Barbara M. Goldsmith, Ph.D., FACB
Professor and Chair

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Professor
Director, Biotechnology/Applied Molecular Technologies Programs

Stephen C. Peiper, MD
Professor
Chairman & Peter A. Herbut Professor, Department of Pathology, Anatomy and Cell Biology

Tatiana Zorina, MD, PhD, CT(ASCP)CM
Associate Professor
Program Director, Cytotechnology/Cell Sciences Programs

Jennifer Slodysko, MS, MLS(ASCP)CM
Instructor, Program Director, Medical Laboratory Science Programs

Nathan Pickard, PhD
Assistant Professor

Geoffrey Toner, MS, MB (ASCP)CM
Instructor, Education Coordinator

Carolyn Grotkowski, MD
Clinical Associate Professor

Scott Gygax, PhD
Clinical Assistant Professor

Randall W. Hammond, PhD
Clinical Assistant Professor

Katharine A. Muirhead, PhD
Clinical Assistant Professor

Rossitza Draganova-Tacheva, MD
Clinical Assistant Professor, Department of Pathology, Anatomy and Cell Biology
Medical Director, Cytology and Cell Sciences Program

Zi-Xuan Wang, PhD
Clinical Assistant Professor, Department of Pathology, Anatomy and Cell Biology

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Lecturer

Olarae Giger, PhD
Lecturer

Gene L. Gulati PhD
Lecturer

Erin Heine, PhD
Lecturer

Kelly Doxzon, MBA, CT(ASCP)
Laboratory Teaching Associate

Chris Evanish, HT(ASCP)
Laboratory Teaching Associate
Kelly Lennen, MS, CT(ASCP)  
Laboratory Teaching Associate  
Valerie Jalicke, MS, MLS(ASCP)  
Laboratory Teaching Associate  
Diane Kane, MS, CT(ASCP)  
Laboratory Teaching Associate  
Ekaterina Mashkina, MS, MLS (ASCP)  
Laboratory Teaching Associate  
Douglas Stickle, PhD  
Professor, Sidney Kimmel Medical College  
Taryn Waraksa, MS, CT(ASCP)CM  
Lecturer  

DEPARTMENT OF MEDICAL LABORATORY SCIENCES AND BIOTECHNOLOGY STAFF  

Nicole Warren, Administrative Assistant  

DEPARTMENT OF MEDICAL LABORATORY SCIENCES AND BIOTECHNOLOGY  
CONTACT INFORMATION  
Thomas Jefferson University  
Jefferson College of Health Professions  
Department of Bioscience Technologies  
130 S Ninth Street, Edison Building, 21st Floor  
Philadelphia, PA 19107
MEDICAL LABORATORY SCIENCES AND BIOTECHNOLOGY COURSE DESCRIPTIONS
Courses are described in numerical order within academic departments. The number within parentheses following the course title indicates the number of semester credits assigned to each course. Courses with prefixes other than BT, CT, MB, MT or LS are described in the Department of Professional and Continuing Studies Chapter.

Core Curriculum Courses
CHEMISTRY 304/504
Biochemistry (3)
Examines structure and function of biological macromolecules, polysaccharides, proteins and nucleic acids; lipids; enzymes and metabolism; bioenergetics; control mechanisms; hormones; body fluids; nutrition; and biochemical pathology.

LABORATORY SCIENCES 301/501
Molecular Biology (3)
Principles and mechanisms of cellular function at the molecular level, including an overview of experimental techniques; protein structure and function, gene expression, chromosome structure and replication; the cell cycle; transcription and translation, cell signaling pathways; molecular basis of genetic disease and cancer, and diagnostic applications.

LABORATORY SCIENCES 303
Fundamental Clinical and Experimental Techniques (3)
Orientation to fundamental theories and practice in core competencies common to all bioscience disciplines, including safety; microscopy; operating principles; use and maintenance of basic instruments and supplies; laboratory mathematics; molecular concepts; information processing; principles of laboratory education; and clinical correlations. Lecture and laboratory.

LABORATORY SCIENCES 311/511
Functional Histology (2)
Microscopic study of the human body including normal structure and function and relationships to life processes through computer interactive, lecture and microscopy laboratory sessions. Available as an online course with permission of program director.

LABORATORY SCIENCES 413/613
Pathology (2)
Study of basic disease processes of the body including inflammation, repair, fluid and hemodynamic disorders, and neoplasia; and specific disease processes affecting the major body systems.

LABORATORY SCIENCES 416/816
Comprehensive Exam (1)
Background readings, comprehensive review and self-administered quizzes/exams in the discipline-specific body of knowledge and scope of practice necessary to prepare for national certification examination(s). Web-based course.
Prerequisite: Completion of at least two practicum courses.
LABORATORY SCIENCES 430
Laboratory Standards and Practices (3)
Ethical, financial, legal, managerial/supervisory, professional standards and communications, regulatory, research and technological issues as they effect contemporary laboratory practice, laboratory technologists and laboratory services. Exams, student-centered classroom discussions and assignments are based on information drawn from print, electronic and visual sources.

LABORATORY SCIENCES 440
Current Research in the Biosciences (2-3)
Examination and critical review of the literature pertaining to the bioscience disciplines of biotechnology, cytotecnology and medical technology. Students and faculty present important papers from contemporary literature for critical discussion. Education methods and communication skills relevant to conveying scientific findings are emphasized. Undergraduate students submit a written synopsis of weekly topics. Entry-level masters students select a topic of interest, research the literature and produce a comprehensive review suitable for publication in a peer-reviewed journal.

LABORATORY SCIENCES 498
Special Topics in Laboratory Science (2)
Student-designed, arranged and implemented experience in a setting directly or indirectly related to laboratory sciences. Practical and/or theoretical studies may be selected from laboratory practice areas (histotechniques and histopathology, electron microscopy, forensics, veterinary; flow cytometry, cytopreparation); laboratory practice settings (physician office, home health service, community clinic, OR/Stat lab); administration (managed care, laboratory or research); education (public, professional); diagnostic and/or treatment services (radiography, respiratory care, nuclear medicine, dialysis, IV therapy, family medicine); and community service. These or other experiences are subject to availability and/or scheduling restrictions. Depending on the area selected, competence assessment and/or a summary report is required.
Prerequisite: Approval of course coordinator and program director.

LABORATORY SCIENCES 399, 499, 699
Independent Study (1 to 6)
Study under faculty supervision of an area or topic not included in the formal curriculum, with emphasis on individual study and research. Eligible students must obtain faculty sponsorship. Objectives, settings, implementation strategies, preceptorship and evaluation criteria are the responsibility of the student and program faculty. A maximum of six semester credits during the entire program may be earned by independent study. Prerequisites: completion of one semester of study, good standing in the School and department, a minimum grade point average of 2.00 (2.90 for graduate students), and approval of faculty advisor and program director.

Biotechnology/Applied Molecular Technologies Courses

BIOTECHNOLOGY 303/503
Molecular Preparatory Techniques (1)
Basic aspects of biotechnology laboratory work: gel preparation, buffer composition, media preparation, streaking and isolating bacteria. Lecture and laboratory.
BIOTECHNOLOGY 310/510
Basic Molecular Techniques (4)
Discussion, demonstration and practice of basic molecular techniques including DNA/RNA isolation, restriction digest, gel electrophoresis and blotting techniques. Lecture and laboratory. Co-requisite: BT 303/503

BIOTECHNOLOGY 320/520
Cell and Tissue Culture Techniques (4)
Sterile technique, suspension and adherent culture, growth curve, cryopreservation, cell cycle analysis, imaging, laboratory safety and documentation. Lecture & laboratory.

BIOTECHNOLOGY 401/601
Systems Biology (2)
Cross-disciplinary course combining flow cytometry, digital imaging technologies, bioinformatics and molecular modeling aimed at understanding organisms as a whole. Presents methods by which specific biological information relating to DNA, RNA, proteins, cells and tissues are integrated and modeled. Prerequisite: Laboratory Sciences 301/501, or permission of Program Director

BIOTECHNOLOGY 403/603
Human Genetics (3)
Overview of principles of heredity and their significance. Topics include principles of heredity, patterns of transmission, pedigree analysis, gene action, mutations, gene linkage, gene localization, somatic cell genetics, immunogenetics and population genetics. Prerequisite: Laboratory Sciences 301/501

BIOTECHNOLOGY 405/605
Microbial Genetics (3)
Specialized topics in microbiology and molecular genetics. Examines the biology of human bacteria, yeast and viruses with special emphasis on their use in molecular genetics. Lecture/seminar. Co-requisite: Laboratory Sciences 301/501

BIOTECHNOLOGY 410/610
Molecular Diagnostic Techniques (4)
Introduces clinical applications of molecular techniques. Includes discussion, demonstration and practice of molecular techniques including detection of gene mutations, oncogene amplification and loss of tumor suppressor gene function. Covers advanced techniques such as forensics, probe development and cloning and sequencing. Lecture & laboratory. Prerequisite: Biotechnology 310/510

BIOTECHNOLOGY 411/611
Protein Purification and Characterization (3)
Introduction to theory and applications of protein purification, characterization, and enzymology. Students perform various types of chromatography, gel filtration, ion exchange chromatography, affinity chromatography, protein assays, protein analysis, SDS PAGE, spectroscopic methods, and enzyme kinetics. Lecture & laboratory. Prerequisite: Biotechnology 310/510
BIOTECHNOLOGY 412, 422, 432, 442
Biotechnology Practica I, II, III, IV (4 each)
Undergraduate practical internships in biotechnology laboratories. Students participate in all phases of laboratory functions relating to the various applications of biotechnology including, but not limited to, molecular diagnostics, basic and applied research and forensics. As appropriate, students will also participate in relevant continuing education activities, attend seminars and engage in other professionally related activities.
Prerequisites: Completion of pre-practicum Biotechnology and Core Curriculum coursework

Cytotechnology/Cell Sciences Courses

CYTOTECHNOLOGY 301/501
Principles of Cell Analysis (2)
Cell identification methods and morphologic criteria used in the evaluation of cytology specimens. Emphasis on manual and automated microscopy for detection and interpretation of basic cell types and changes found in conventional and liquid-based cytology specimens. Lecture and laboratory.

CYTOTECHNOLOGY 303
Histologic and Electron Microscopic Techniques (2)
Introduction to histologic preparatory techniques and special stains. Preparation techniques and principles of operation for electron microscopic study.
Prerequisite: Permission of program director.

CYTOTECHNOLOGY 307/507
Cell and Molecular Laboratory Techniques (4)
Modular course focusing on the techniques, procedures and protocols used in cytological, histologic, and molecular preparation and interpretation of anatomic specimens using genetic technologies, flow cytometry, nucleic acid hybridization and amplification techniques, immunochemistry and biosensor technology. Laboratory sessions cover contemporary procedures for diagnostic testing such as prognostic markers, DNA analysis FISH, PCR, blotting techniques and DNA sequencing. Lecture and laboratory.
Prerequisite: CT 311/511 or permission of program director

CYTOTECHNOLOGY 311/511
Gynecologic Cytology and Histocorrelations (5)
Study of the anatomy, physiology, cytology and pathophysiology of the female genital tract and corresponding cellular manifestations which provide diagnostic information. Lecture.
Prerequisite: Cytotechnology 301/501

CYTOTECHNOLOGY 312/512
Gynecologic Cytology and Histocorrelations Laboratory (3)
Integration of didactic information pertaining to the female genital tract, with application of diagnostic criteria to develop practical analytical expertise. Students interpret laboratory data, explain the significance of the data to a patient’s condition and offer diagnoses and/or recommendations for further testing. Laboratory sessions include independent microscopy following by the evaluation of the students’ diagnosis/readouts via one-on-one and multi-head sessions.
Prerequisite: Cytotechnology 301/501
CYTOTECHNOLOGY 315/515
Non-Gynecologic Cytology and Histocorrelations I (4)
Study of the anatomy, physiology, cytology and pathophysiology of the respiratory tract (including lung FNA’s), fine needle aspiration cytology of mediastinum, breast, liver, pancreas and salivary glands, kidney and adrenals, with application of cytohistologic and molecular diagnostic criteria to develop practical analytical expertise. Students interpret laboratory data, explain the significance of the data to a patient’s condition and offer diagnoses and/or recommendations for further testing. Lecture & Laboratory.
Prerequisites: Cytotechnology 311/511, 312/512

CYTOTECHNOLOGY 317/517
Non-Gynecologic Cytology and Histocorrelations II (4)
Study of the anatomy, physiology, cytology and pathophysiology of the gastrointestinal tract (brushes), urinary tract, effusions including CSF, fine needle aspiration cytology of thyroid, lymph nodes, bone and soft tissue, with application of cytohistologic and molecular diagnostic criteria to develop practical analytical expertise. Students interpret laboratory data, explain the significance of the data to a patient’s condition and offer diagnoses and/or recommendations for further testing. Lecture and Laboratory
Prerequisites: Cytotechnology 315/515

CYTOTECHNOLOGY 325/525
Cellular, Molecular and ImmunoDiagnostics (3)
Review, microscopic examination and comprehensive analysis of selected cases in gynecologic, nongynecologic and fine needle aspiration cytology. Special emphasis on differential diagnosis, clinical correlations, decision-making algorithms and diagnostic pitfalls. Differential diagnostic panels based on molecular and immunologic ancillary technologies are discussed with stress on the laboratory diagnostic triaging and tumor markers. Course is provided based on interactive learning modules.

CYTOTECHNOLOGY 403
Histopathology (1)
Technical preparation of tissue specimens for microscopic examination, including gross dissection of tissues, paraffin processing, sectioning and routine and special staining. Microscopic analysis of the tissue specimens and preparation of a histopathologic report.
Prerequisite: Permission of program director.

CYTOTECHNOLOGY 412, 413, 414, 415
Cytotechnology Practica I, II, III, IV (4 each)
Undergraduate clinical internships in a variety of cytopathology laboratories. Students participate in all phases of diagnostic service work and laboratory functions (preanalytical, analytical, postanalytical) that may include continuing education activities, adjunct diagnostic technologies and seminar attendance.
Prerequisites: Completion of pre-practicum Cytotechnology and Core Curriculum coursework

Medical Laboratory Sciences Courses

MEDICAL TECHNOLOGY 307/507
Clinical and Molecular Laboratory Techniques (4)
Modular course focusing on the techniques, procedures and protocols used in the chemical, microscopic and molecular preparation and interpretation of biologic fluids and other human specimens using
clinical analysis, genetic technologies, flow cytometry, HLA tissue typing, nucleic acid hybridization and amplification techniques, immunochemistry and biosensor technology. Laboratory sessions cover contemporary procedures for diagnostic testing such as prognostic markers, DNA analysis FISH, PCR, blotting techniques and DNA sequencing. Lecture and laboratory
Prerequisite: MT 323/523 and MT 331/531 or permission of program director

MEDICAL TECHNOLOGY 312/512
Microbiology I (3)
Examines the biology of clinically significant bacteria. Emphasizes physiology and morphology of pathogenic bacteria and the key laboratory diagnostic tests used for their identification. Discusses pathogenic bacteria with respect to their associated clinical syndromes, epidemiology, mechanisms of infection, antimicrobial treatment and susceptibility testing. Contemporary laboratory methodologies used to examine clinical specimens are reviewed. Lecture and laboratory.

MEDICAL TECHNOLOGY 313/513
Microbiology II (3)
Continuation of MT 312. Epidemiology, pathogenesis, laboratory diagnosis and treatment of the following classes of microorganisms: parasites, fungi, mycobacteria, Nocardia, Chlamydia, rickettsiae, mycoplasma, spirochetes and virology. Uses contemporary laboratory methodologies and clinical correlations to examine prepared specimens and infectious processes. Lecture and laboratory.
Prerequisite: Medical Technology 312/512

MEDICAL TECHNOLOGY 323/523
Chemistry I (2)
Study of the significance of chemical analytes indicative of human health and disease. Theory, operating principles and utilization of biochemical instrumentation and techniques for research in and testing of clinically significant analytes. Photometric and electrophoretic methodologies are used to test analytes including but not limited to carbohydrates, proteins, enzymes, lipids, drugs of abuse, therapeutic drugs and tumor markers. Quality control and preventive maintenance methods are emphasized. Lecture and laboratory.

MEDICAL TECHNOLOGY 324/524
Chemistry II (3)
Continued study in the theory, operating principles and utilization of biochemical instrumentation and techniques for testing of clinically significant analytes, with correlation of test data to a patient’s clinical status. Emphasis on the study of hormones, electrolytes, water metabolism, blood gases, renal, hepatic and pancreatic functions and nutrition. Lecture and laboratory.
Prerequisite: Medical Technology 323/523

MEDICAL TECHNOLOGY 331/531
Immunology (3)
Examines basic principles and mechanisms of the immune system in the physiologic condition and in the disease. Contains didactic and laboratory practical modules. Immune mechanisms in infections, hypersensitivity reactions, autoimmunity, immunodeficiencies, as well as tumor and transplantation immunology are discussed. The lectures are provided on the BBL as PowerPoint presentations with written notes under each slide. The students are required to study them and recommended textbook materials BEFORE the lecture date. During lecture time there is no actual lecturing, but instead, the
testing of the learned material using TurningPoint assessment software and discussion of difficult concepts take place.

**MEDICAL TECHNOLOGY 341/541**

**Hematology I (3)**

Introduction to the hematopoietic system through study of the origin, development, and function of red blood cells, including normal physiology and metabolism of red cells. Normal and abnormal red and white blood cell morphology, and associated pathological findings are examined. Basic techniques employed in clinical hematology laboratories are taught and testing is performed on human blood samples. Introduction to blood collection techniques. Lecture and laboratory.

**MEDICAL TECHNOLOGY 343/543**

**Hematology II (3)**

Continued study of the hematopoietic system through study of abnormal white blood cell morphology and associated pathological findings. Normal and pathologic conditions of the coagulation process are examined. Basic techniques employed in clinical hematology laboratories are taught and testing is performed on human blood samples. Students continue to practice blood collection techniques. Lecture and laboratory.

Prerequisite: Medical Technology 341/541

**MEDICAL TECHNOLOGY 352/552**

**Immunohematology (3)**

Principles and protocols of modern transfusion services, covering blood typing, testing for antibodies and antigens, crossmatching, neonatal testing, and quality systems; immunology of hematologic diseases. Lecture and laboratory.

Prerequisite: Medical Technology 331/531

**MEDICAL TECHNOLOGY 412, 422, 442, 454**

**Clinical Practica I, II, III, IV (4 each)**

Undergraduate practical internships in clinical and/or research laboratories. Students participate in all phases of laboratory functions common to contemporary clinical laboratory practice including, but not limited to, microbiology (routine and specialized procedures in bacteriology, mycology, parasitology, virology and serology), chemistry (routine and specialized procedures in general chemistry, toxicology, therapeutic drug monitoring and chemical immunoassay), hematology (routine and specialized procedures in clinical hematology, coagulation and other biologic fluids), immunohematology (routine and specialized procedures in blood banking and transfusion medicine) and immunopathology (immunodiagnostics, serology). Students also participate in relevant continuing education activities and engage in other professionally-related activities.

Prerequisites: Completion of pre-practicum Medical Laboratory Science and Core Curriculum coursework
GRADUATE PROGRAM

Laboratory Sciences  Core Curriculum Courses

LABORATORY SCIENCES 603
Research Design (3)
Methods and techniques for extending the scientific base of knowledge for bioscience laboratory practice. Students analyze contemporary research studies, designs and related statistical processes to assess their appropriateness for answering experimental hypotheses and laboratory practice issues. Education methods and communication skills relevant to disseminating scientific findings are emphasized.

LABORATORY SCIENCES 610
Regulatory and Fiscal Issues in Laboratory Management (3)
Study and application of professional, regulatory and fiscal requirements for laboratory operations including federal, state and local requirements governing clinical and research laboratories; compliance issues; billing and reporting requirements for laboratories using private, managed care and other third party payers (including federal government programs); current procedural terminology to assign and bill for laboratory procedures; budgeting for laboratory operations.

LABORATORY SCIENCES 620
Laboratory Information Systems (3)
Design and use of information systems and laboratory informatics for clinical, anatomic and research laboratories. Vendor demonstrations, hands-on practice and trouble-shooting of data protocol development, input and retrieval to produce useful information for laboratory operations.

LABORATORY SCIENCES 630
Laboratory Services Research (3)
Overview of the various techniques and resources used to influence and measure performance improvement, proper test utilization and best practices as strategies to improve the effectiveness of patient care. Students examine the relevant literature and develop instruments to assess the laboratory’s role in cost-effectiveness, access to laboratory testing and quality of laboratory testing.

LABORATORY SCIENCES 640
Methods in Bioscience Education (3)
An exploration of the modern pedagogy unique to science education and learning environments. Includes the design and delivery of content, an exploration of active learning environments, student engagement, online learning and the integration of writing and critical thinking in the classroom.

LABORATORY SCIENCES 644
Laboratory Education Administration and Instruction (2-4)
Completion of teaching and learning experience(s) in classroom, on-line and/or laboratory practice settings. Students acquire and demonstrate fundamental knowledge and practical skills in education administration, delivery and evaluation.
Pre/Co-requisite: Laboratory Sciences 640 and completion of or concurrent discipline-specific coursework in the planned area of performance and permission of Program Director.
LABORATORY SCIENCES 645
Laboratory Administration and Management (2-4)
On-site interaction with and immersion in administrative duties enabling students to observe, participate in and evaluate the various functions and responsibilities associated with laboratory organization and management. Under direct supervision of a laboratory director, supervisor, manager, or administrator, the student assesses management and administrative roles and outcomes within the laboratory as a means to develop and refine leadership skills
Pre/Co-requisite: LS 610 or other approved graduate management course.

LABORATORY SCIENCES 801, 802
Research Project I, II (1, 2)
Research using the various techniques and resources available to conduct experimental research and/or measure performance improvement, test utilization, best practices and clinical outcomes. A publishable paper and oral presentation are required at the conclusion of the project.

LABORATORY SCIENCES 812, 813, 814, 815
Practica I, II, III, IV (2 each)
Graduate internships in affiliated laboratories. Students rotate through all phases of laboratory work and functions in their respective disciplines. Components include practical work experience, participation in and/or observation of specialty area(s), quality assurance and continuing education activities, seminar attendance and adjunct technologies. Advanced master’s students may also expect to participate in undergraduate teaching or management internships.
Prerequisite: Completion of pre-practicum discipline-specific and Core Curriculum coursework.
Occupational Therapy
DEPARTMENT OF OCCUPATIONAL THERAPY
The Department of Occupational Therapy provides innovative educational programs designed to prepare students to enter the profession of Occupational Therapy as qualified entry-level professionals. Students are taught to systematically consider all of the complex issues that influence an individual’s ability to engage in occupation and participate within personal, cultural, physical, social, virtual, and spiritual contexts in order to provide effective interventions.

THE OCCUPATIONAL THERAPY PROGRAMS OFFERED AT THOMAS JEFFERSON UNIVERSITY

A Master’s degree is required for entry to the profession of occupational therapy. The department offers two entry-level programs that can lead to qualification for certification in occupational therapy. The first option is an upper division (junior, senior and graduate year) full-time program leading to a Combined Bachelor of Science in Occupation and Health and a Master of Science in Occupational Therapy (Combined BSMSOT Program). Students are admitted to the program in the Jefferson College of Health Professions after completing two years of college-level courses that satisfy pre-professional requirements. These pre-professional requirements can be earned at any accredited college or university. Students must complete a total of 120 semester credits, 58 prerequisite credits and 62 credits in the prescribed Occupational Therapy Curriculum to meet the baccalaureate degree requirements and 35 graduate credits to meet the graduate degree requirements of the program. Upon successful completion of the Combined BSMSOT Program, students are concurrently awarded the Bachelor of Science in Occupation and Health and Master of Science in Occupational Therapy degrees.

Students who already have a bachelor’s degree in a field other than occupational therapy are encouraged to apply to the Entry-Level Masters of Science in Occupational Therapy Program (EMOT). This program integrates entry-level education with graduate studies. Students who have a bachelor’s degree, have fulfilled pre-professional requirements and meet admission criteria can apply to the program. This program is completed in two years. The coursework includes 47 undergraduate credits of basic professional knowledge and 35 graduate credits of advanced knowledge and skill.

Both of these occupational therapy programs are designed to prepare students for work as entry-level practitioners in a variety of settings. Students have opportunities to do advanced work and independent study in areas such specialized practice, research, academic teaching, collaboration with professional organizations, and entrepreneurial projects under the mentorship of a faculty member.

The Department of Occupational Therapy’s entry level programs are both accredited by the Accreditation Council for Occupational Therapy Education (ACOTE of the American Occupational Therapy Association [AOTA]).

For students who already have a degree in occupational therapy (undergraduate degree, post-baccalaureate certificate or master’s degree) the Post Professional Occupational Therapy Doctoral Degree is offered. This program provides students with advanced skills and knowledge, prepares students to be innovators in traditional and emerging areas of occupational therapy and offers opportunities to develop or refine academic and clinical teaching skills.
PROGRAM ACCREDITATION
Both the Combined BSMSOT Program and the EMOT program are accredited by the Accreditation Council for Occupational Therapy Education (ACOTE). Contact information for ACOTE is:

Accreditation Council for Occupational Therapy Programs (ACOTE) of the American Occupational Therapy Association
4720 Montgomery Lane
PO Box 31220
Bethesda, MD 20814-3425
301-652-6611 x2914
accred@aota.org
http://www.aota.org/Education-Careers/Accreditation/Contacts.aspx

Accreditation is a system for recognizing educational institutions and professional programs affiliated with those institutions for a level of performance, integrity, and quality which entitles them to the confidence of the educational community and the public they serve. Accreditation of educational programs for the occupational therapist and the occupational therapy assistant is granted by the Accreditation Council for Occupational Therapy Education (ACOTE®) of the American Occupational Therapy Association (AOTA). ACOTE is recognized as the accrediting agency for occupational therapy education by the United States Department of Education (USDE) and the Council for Higher Education Accreditation (CHEA). Jefferson’s last ACOTE accreditation was granted in 2006. The next reaccreditation is scheduled for 2016.

ELIGIBILITY FOR CERTIFICATION AND LICENSURE
Students who successfully complete both academic and fieldwork requirements in the entry level EMOT and Combined BSMSOT programs are eligible to take the Certification Examination of the National Board for Certification in Occupational Therapy, Inc. (NBCOT). The computerized examination is offered on demand. Persons successfully completing the examination are permitted to use the designation Occupational Therapist, Registered (OTR) and are eligible to apply for a permanent state licensure to practice.

For further information on the certification process, please contact NBCOT at:

12 South Summit Avenue
Suite 100
Gaithersburg, MD 20877
Phone: (301) 990-7979
Fax: (301) 869-8492
Email: info@nbcot.org

COMBINED BACHELOR'S TO MASTERS DEGREE PROGRAM (COMBINED BSMSOT)

Curriculum (Combined BSMSOT) - 3 years full time

<table>
<thead>
<tr>
<th>Year</th>
<th>Schedule</th>
<th>Full-Time Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>September-May</td>
<td>fall and spring semester coursework</td>
</tr>
<tr>
<td></td>
<td>May- June</td>
<td>summer semester coursework</td>
</tr>
</tbody>
</table>
2nd September-May  fall and spring semester coursework
May-June  summer semester coursework
June/July  begin 2 full-time Level II fieldwork rotations and online coursework

3rd September-December  continue full-time Level II fieldwork and online coursework
January-May  spring semester coursework

Year One
FALL SEMESTER
Credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 300</td>
<td>Introduction to Applied Science</td>
<td>1 u</td>
</tr>
<tr>
<td>OT 302</td>
<td>Applied Anatomy and Kinesiology (Lecture/Laboratory)</td>
<td>4 u</td>
</tr>
<tr>
<td>OT 311</td>
<td>Health and Health Conditions</td>
<td>4 u</td>
</tr>
<tr>
<td>OT 321</td>
<td>Foundations of Occupation-Centered Practice Laboratory I</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 330</td>
<td>Using an Occupational Therapy Lens in the Clinic (Fieldwork Level I)</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 336</td>
<td>Occupation Through the Life Span (Lecture/Laboratory)</td>
<td>5 u</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
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SPRING SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMST 201</td>
<td>Technology Applications for Healthcare</td>
<td>3 u</td>
</tr>
<tr>
<td>OT 308</td>
<td>Concepts in Neurodevelopment (Lecture/Laboratory)</td>
<td>4 u</td>
</tr>
<tr>
<td>OT 322</td>
<td>Foundations of Occupation-Centered Practice Laboratory II</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 340</td>
<td>Domains of Occupational Therapy Practice (Fieldwork Level I)</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 357</td>
<td>Evaluation Process (Lecture/Laboratory)</td>
<td>4 u</td>
</tr>
<tr>
<td>OT 577</td>
<td>Historical Perspectives on Theory Based Practice</td>
<td>3 g</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>15 u/3 g = 18</strong></td>
</tr>
</tbody>
</table>

SUMMER SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT 341</td>
<td>Occupational Analysis and Evaluation (Fieldwork Level I)</td>
<td>2 u</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

Year Two
FALL SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT 440</td>
<td>Interventions: Enhancing Human Performance (Fieldwork Level I)</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 441</td>
<td>Interventions: Enhancing Social Participation (Fieldwork Level I)</td>
<td>2 u</td>
</tr>
<tr>
<td>OT 552</td>
<td>Interventions: Enhancing Human Performance (Lecture/Laboratory)</td>
<td>5 g</td>
</tr>
<tr>
<td>OT 558</td>
<td>Interventions: Enhancing Social Participation</td>
<td>3 g</td>
</tr>
<tr>
<td>Graduate elective</td>
<td></td>
<td>3 g</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4 u/11 g = 15</strong></td>
</tr>
</tbody>
</table>
SPRING SEMESTER
Undergraduate elective 3 u
Undergraduate elective 3 u
ID 302 Understanding Research Principles and the Scientific Method 3 u
OT 560 Interventions: Environmental Competence 3g
OT 561 Environmental Competence Lab 1 g
OT 562 Environmental Competence in Action 1 g
OT 600 Occupational Therapy Professional Seminar 1 g
Total 9 u/ 6 g = 15

SUMMER SEMESTER
OT467 Health Services Administration and Professional Development 2 u
OT 603 Research Mentorship and Methods 4 g
Total 2 u/4g = 6

SUMMER SEMESTER
OT 480 Fieldwork Level II A (July through end of September) 6 u
OT 578 Evidence-Based Practice I (July through September) 1 g
Total 6 u/1 g = 7

Year Three
FALL SEMESTER
OT 482 Fieldwork Level II B (October through December) 6 u
OT 579 Evidence-Based Practice II (October through December) 1 g
Total 6 u/1 g = 7

SPRING SEMESTER
OT 682 Clinical Leadership 3 g
OT 627 Program Design and Evaluation 3 g
OT 670 Advanced Research Seminar 3 g
Total 9 g = 9

Descriptions for courses listed above are found in the section entitled “Course Descriptions.” Courses with prefixes other than OT are described in the Department of Professional and Continuing Studies section of the JCHP catalog.

Credit Summary
Credits Required for Admission: 58
TJU Undergraduate Credits: 62
Total # of Credits for TJU Bachelor of Science Requirement: 120
Total # of Credits for TJU Graduate Degree Requirement: 35

By the end of the spring semester of the second year, students must have a minimum of a 3.0 cumulative GPA in order to progress to the six-month full-time fieldwork requirement. A student who fails to achieve a 3.0 cumulative GPA is not eligible to enroll in Level II Fieldwork.
The College does not award a Bachelor of Science in Occupation and Health degree independent of the Master of Science degree. Candidates awarded Combined Bachelor’s and Master’s degrees must have successfully completed all credits and other requirements of the program, and have a cumulative grade point average of 3.0 or higher on all work completed. Upon successful completion of the Combined BSMSOT Program, students are concurrently awarded the Bachelor of Science in Occupation and Health and a Master of Science in Occupational Therapy. Students who successfully complete both academic and fieldwork requirements are eligible to take the Certification Examination of the National Board for Certification in Occupational Therapy, Inc. (NBCOT).

ENTRY-LEVEL MASTERS DEGREE PROGRAM (EMOT)
This program is designed for applicants who have earned a bachelor’s degree from an accredited college or university in a field other than occupational therapy and who have completed the prerequisites required for applicants to Jefferson’s Master’s degree program in occupational therapy. The EMOT program is completed on a full basis. Students may enter through articulation agreements with other colleges and universities (see the Office of Admissions website for the most current listing of college/university articulation agreements).

Curriculum (EMOT) (Full-Time, 2 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>Schedule</th>
<th>Full-Time Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>September – May</td>
<td>fall, spring semester coursework</td>
</tr>
<tr>
<td></td>
<td>May-June</td>
<td>summer semester coursework</td>
</tr>
<tr>
<td>2nd</td>
<td>September - December</td>
<td>fall semester coursework</td>
</tr>
<tr>
<td></td>
<td>January – June</td>
<td>two 12-week full-time Level II fieldwork rotations and online coursework</td>
</tr>
<tr>
<td></td>
<td>July-August</td>
<td>summer semester coursework</td>
</tr>
</tbody>
</table>

Year One
FALL SEMESTER
(u = undergraduate; g = graduate credits) Credits

| OT 302 | Applied Anatomy and Kinesiology (Lecture/Laboratory) | 4 u |
| OT 311 | Health & Health Conditions                           | 4 u |
| OT 321 | Foundations of Occupation-Centered Practice Laboratory I | 2 u |
| OT 336 | Occupation Through the Lifespan                     | 5 u |
| OT 340 | Domains of Occupational Therapy Practice (Fieldwork Level I) | 2 u |
| OT 600 | Occupational Therapy Professional Seminar           | 1g  |
| Total  |                                                     | 17u/1 g = 18 cr |

SPRING SEMESTER

| OT 308 | Concepts in Neurodevelopment (Lecture/Laboratory)    | 4 u |
| OT 322 | Foundations of Occupation-Centered Practice Laboratory II | 2 u |
| OT 357 | Evaluation Process (Lecture/Laboratory)              | 4 u |
| OT 560 | Interventions: Environmental Competence              | 3 g |
| OT 561 | Environmental Competence Lab                         | 1 g |
| OT 562 | Environmental Competence in Action                   | 1 g |
| OT 577 | Historical Perspectives on Theory Based Practice     | 3 g |
| Total  |                                                     | 10u/8g = 18 cr |
SUMMER SEMESTER
OT 341 Occupational Analysis & Evaluation (Fieldwork Level 1) 2 u
OT 467 Health Services Administration & Professional Development 2 u
OT 603 Research Mentorship & Methods 4 g
Total 4 u/4 g = 8 cr

Year Two
FALL SEMESTER
OT 440 Interventions: Enhancing Human Performance (Fieldwork Level I) 2 u
OT 441 Interventions: Enhancing Social Participation (Fieldwork Level I) 2 u
OT 552 Intervention Enhancing Human Performance 5 g
OT 558 Interventions: Enhancing Social Participation 3 g
Elective 3 g
Total 4u/11g = 15 cr

SPRING SEMESTER (January through June)
OT 480 Fieldwork Level II A (January through March) 6 u
OT 578 Evidence Based Practice I (January through March) 1 g
OT 482 Fieldwork Level II B (April through June) 6 u
OT 579 Evidence Based Practice II (April through June) 1 g
Total 12u/2g = 14 cr

SUMMER SEMESTER (July-August)
OT 627 Program Design & Evaluation 3 g
OT 670 Advanced Research Seminar 3 g
OT 682 Clinical Leadership 3 g
Total 9 g = 9 cr

Credit Summary
Undergraduate Credits 47
Graduate Credits 35

By the end of the semester preceding fieldwork II, students must have a minimum of a 3.0 cumulative GPA in order to progress to the six months full-time fieldwork requirement. A student who fails to achieve a 3.0 cumulative GPA is not eligible to enroll in Level II Fieldwork.

FIELDWORK REQUIREMENTS FOR COMBINED BSMSOT AND EMOT PROGRAMS

Purpose of Fieldwork Experience:
The purpose of fieldwork experience is “propel each generation of occupational therapy practitioners from the role of student to that of practitioner” (AOTA, 2009 p. 445). Fieldwork experience provides students with the opportunity to achieve competence in applying the occupational therapy process using evidence based interventions to meet the needs of diverse populations (AOTA, 2009, p. 445). Through fieldwork students integrate academic content and experiential learning and apply the knowledge, skills and attitudes gained in the academic setting to the active delivery of services. Supervised fieldwork experience is an integral part of both the educational process and professional preparation. Two distinct levels of fieldwork experience are established in the ACOTE Standards for an Accredited Educational Program for the Occupational Therapist. Successful completion of Level I and Level II Field-
work experiences are prerequisites for taking the NBCOT Certification Examination. (Please refer to your Fieldwork Manual for details of the fieldwork experience, procedures, and expectations.)

Occupational Therapy is an applied science. Evaluation and intervention techniques are taught by both didactic and experiential methods. Clinical fieldwork experiences are an integral part of professional education. Level I clinical fieldwork is integrated with didactic coursework and is offered concurrently with the didactic curriculum beginning in the first semester giving the students opportunities to develop both observation and practice skills. Combined BSMSOT Program students participate in up to five Level I experiences. EMOT Program students participate in up to four Level I experiences.

Academic Eligibility for Fieldwork:
Students may only progress through Fieldwork courses in the curriculum in sequence. Each experience builds on (successful completion of all) prior coursework. Students will not be enrolled in subsequent clinical fieldwork experiences until current requirements are satisfied. Students will complete both level II fieldworks before completing their final coursework. Students who do not meet the grade point criteria will be guided by their academic advisor according to the most appropriate course of action, which may include repeating coursework to raise the student’s GPA or consideration of other career and degree options.

Level II clinical fieldwork placements (OT480 and OT482) are full time with an emphasis on the application of knowledge learned in the occupational therapy curriculum. Students are required to successfully complete a minimum of six months of full-time clinical training under the supervision of qualified occupational therapists. All occupational therapy students must be in good academic standing with a minimum 3.0 cumulative GPA by the end of the semester preceding beginning Level II clinical fieldwork placements in order to progress onto clinical fieldwork.

Pre-Requisite Requirements for Fieldwork:
Fieldwork sites may require a health clearances such as background check, child abuse clearance, fingerprinting, drug screens and CPR certification at various times through the curriculum in order to permit participation in the fieldwork experience. Participation in fieldwork is a required part of the curriculum and a requirement for graduation. Students are responsible for the cost of these requirements. Fieldwork sites may deny a student’s participation in the clinical fieldwork because of a felony or misdemeanor conviction, failure of a required drug test, or inability to produce an appropriate health clearance, which would result in delayed graduation or in the inability to graduate from the program.

All students in the Department of Occupational Therapy are required to maintain current 2 year CPR certification for health care providers for the duration of their time in the program. Students without the required certification will not be able to participate in fieldwork, resulting in the inability to complete required coursework in a timely manner.

Student Fieldwork Placement and Site Selection:
The Department of Occupational Therapy has fieldwork agreements with hundreds of facilities locally and nationally, each of which offers unique opportunities for student learning. Students are assigned to a range of practice areas for their clinical fieldwork experiences. Practice settings may include medical settings, community health programs, school systems, early intervention programs, work programs and
home environments, to name a few. Students’ needs and interests are incorporated into the preliminary phase of fieldwork site selection; however, placement is the responsibility of the Fieldwork Coordinator.

The students’ exposure to individual/patient/client care begins in the first semester of the program with their Level I Fieldwork and continues throughout the curriculum. Specific details covering Fieldwork placement are available in the Department of Occupational Therapy Student Fieldwork Handbook. Participation in this integrated learning helps students to gain proficiency in the occupational therapy process.

Travel, Transportation and Housing:
Students are responsible for providing their own transportation to fieldwork sites. Housing, living, transportation, and similar additional costs associated with fieldwork are the responsibility of the student. Carpooling and expense-sharing are encouraged.

POST PROFESSIONAL CLINICAL OCCUPATIONAL THERAPY DOCTORAL (OTD) PROGRAM
Jefferson's Post-Professional OTD program (PP-OTD) is a post professional clinical degree open to Bachelor’s and Master’s prepared occupational therapists who wish to create a new vision of occupational therapy, lead in health and human services, and translate their knowledge and skills into evidence based, innovative occupational therapy practice and education. The convenient schedule is designed for busy working professionals: the PP-OTD program can be completed entirely online. Required PP-OTD Learning Community meetings at the beginning and end of the Fall and Spring semesters may be attended either at our center city Philadelphia campus or online.

For Bachelor’s prepared occupational therapists (including those with a post-baccalaureate certificate in occupational therapy), the PP-OTD requires a minimum of 46 credits. For students entering with a Master’s degree, 33 credits are required. The total length of time to complete the program for both Bachelor’s and Master’s prepared students depends on the number of years of experience, whether the program is taken full or part time, and the type of capstone project. A complete listing of coursework and other information for the PP-OTD program is located at: http://www.jefferson.edu/university/health_professions/departments/occupational_therapy/programs/dorcale.html

Jefferson PP-OTD students build on a foundation of knowledge from the arts and sciences, knowledge of current practice issues and entry-level competency in occupational therapy to address the rapidly changing and dynamic nature of contemporary health and human service delivery systems. The program provides opportunities for occupational therapists to use their knowledge and skills in a specific practice area functioning as a direct care provider, consultant, educator, manager, leader, researcher and advocate for the profession and the consumer. As a graduate of the Jefferson PP-OTD program, you will be poised to create a new vision for occupational therapy. You will be prepared to lead in health care and human services, and use your advanced expertise to translate your knowledge and skills into evidence-based, innovative occupational therapy practice that contributes to AOTA’s Centennial Vision. Through participation in courses, interaction with faculty, guidance by mentors, participation in clinical fellowship, and completion of a culminating project, the graduates of the Jefferson PP-OTD program will:
1. **Demonstrate advanced level expertise in a chosen area of practice:**
   a. Demonstrate advanced practice in a chosen area such as direct patient/client service, administration, teaching, and/or research by establishing and integrating scientific evidence into their practice
   b. Utilize a systematic outcome based reasoning process for occupational therapy practice
   c. Demonstrate advanced level skill in evidence based practice
   d. Apply principles of occupation to unique and innovative intervention programs.
   e. Analyze the impact of social, political, economic and cultural influences on health, occupation, and disability.
   f. Integrate an understanding of the impact of disability, disease and social disadvantages on the occupations of individuals and populations.
   g. Adjust their practice, using their understanding of the role of culture and the environment, to an individual’s health needs.
   h. Teach others in area of expertise in both clinical and didactic venues
   i. Demonstrate the ability to integrate theory and practice, and to synthesize advance knowledge in a practice area through completion of a culminating project

2. **Create, evaluate and implement innovative programs that address important, contemporary public health needs**
   a. Demonstrate in-depth knowledge of delivery models, policies and systems related to the area of practice in new and traditional venues
   b. Design, implement and evaluate occupational therapy programs that use the tenets of occupation.
   c. Create new knowledge in occupation-based practice to address the unmet needs of an organization or a community.
   d. Solve complex clinical practice issues using cutting edge, cost effective models of practice.
   e. Present new models of service delivery to administration and management
   f. Publish and present work in interprofessional venues

3. **Become leaders in traditional and contemporary venues**
   a. Develop a personal philosophy of leadership
   b. Create an innovative, advanced professional development plan
   c. Carve out a unique niche for occupational therapy practice or education
   d. Create a vision for innovative and emerging occupational therapy practice.
   e. Take on leadership positions through initiative and collaboration utilizing advanced communication, negotiation, team building, and management skills.
   f. Advocate for the profession of occupational therapy and those that we serve (individual, population, system)
   g. Implement strategies based on organizational theory to evaluate and improve organizational effectiveness, create strategies for change and monitor the success of the implemented strategies.
   h. Utilize leadership skills to create and implement a program or practice based on an identified public health need that includes an analysis of the need for the program, to outline the program, and a sophisticated plan for implementation and evaluation.
   i. Demonstrate skills in teaching others about occupational therapy within and outside of the profession.

All students take core coursework focused on advanced evidence based practice, leadership, and visionary program development.
The curriculum provides an individualized plan of study with electives that match the students’ interests and goals, a fellowship program, and a capstone project. Electives are drawn from the advanced practice specialties in autism, neuroscience, neuro-cognitive disorders, teaching in the digital age, and interprofessional geriatric education in addition to courses that focus on health literacy, cultural competence and humility, and wellness. Students may also take a Seminar in Clinical Research, in which they determine individual learning goals in an area of interest with the guidance and mentorship of one or more faculty members to develop their ideas, knowledge, and skills for the final doctoral project.

The OTD program includes an 80-hour Fellowship designed to immerse the student in advanced practice, program development, and/or policy and provide opportunities for professional growth in an identified area of interest. The Fellowship is a substantive project that advances student’s knowledge and skills in program development and evaluation, the ability to create new practice models, approaches to OT education, and/or clinical research. The Fellowship is followed by the Capstone, in which students disseminate project results by preparing a manuscript for in a publication in a peer reviewed journal. Students are also encouraged to share their work through state, national and international conference presentations.

ADVANCED PRACTICE CERTIFICATES

Specialty certificates in occupational therapy offer individuals with an occupational therapy degree and license specialized knowledge in a specific area. The curriculum for each of the advanced practice certificates consists of four graduate level courses that total 12 credits and can be completed part-time over 12 - 16 months. Jefferson currently offers certificates in Autism, Neuroscience, Neuro-cognitive disorders, Teaching in the Digital Age, and Interprofessional Geriatric Education. For more information about the Certificate programs see: http://www.jefferson.edu/university/health_professions/departments/occupational_therapy/programs/certificates.html. All certificates can be completed entirely in an online format and coursework can be used toward a clinical doctorate in occupational therapy (PP-OTD) at Jefferson.
DEPARTMENT OF OCCUPATIONAL THERAPY FACULTY
Roseann C. Schaaf, PhD, OTR/L, FAOTA
   Chair and Professor
Allison Bell, MS, OTR/L
   Assistant Professor
Teal Benevides, PhD, OTR/L
   Assistant Professor
Philippa H. Campbell, PhD, OTR/L
   Professor and Director, Child and Family Studies Research Programs
Tina DeAngelis, EdD, OTR/L
   Associate Professor and Director, EOTD Program
E. Adel Herge, OTD, OTR/L, FAOTA
   Associate Professor and Director, Combined BSMSOT Program
Stephen B. Kern, PhD, OTR/L, FAOTA
   Associate Professor and Director, EMOT Program
Susan E. Toth-Cohen, PhD, OTR/L
   Professor and Director, OTD Program
Caryn R. Johnson, MS, OTR/L, FAOTA
   Associate Professor and Fieldwork Coordinator
Arlene Lorch, OTD, OTR/L, CHES
   Assistant Professor
Kimberly Mollo, OTD, OTR/L
   Assistant Professor
Mary Muhlenhaupt, OTD, OTR/L, FAOTA
   Assistant Professor
Maryjane Mulchahey, PhD, OTR/L
   Professor
Catherine V. Piersol, PhD, OTR/L
   Associate Professor
Tracey Vause-Earland, MS, OTR/L
   Assistant Professor
Shelley L. Wallock, DrPH, OTR/L
   Assistant Professor
Audrey Zapletal, MS, OTR/L
   Assistant Professor
Janice P. Burke, PhD, OTR/L, FAOTA
   Professor and Dean, Jefferson College of Health Professions
Debra Zelnick, OTD, OTR/L
   Assistant Professor and Senior Associate Dean, Jefferson College of Health Professions
DEPARTMENT OF OCCUPATIONAL THERAPY STAFF
Lydia Navarro-Walker,
    Assistant Fieldwork Coordinator
Patricia Priore, Executive Associate to the Chair
Jamie Fusetti, Administrative Assistant
Seth Sobottka, Administrative Assistant/Fieldwork Secretary

DEPARTMENT OF OCCUPATIONAL THERAPY CONTACT INFORMATION
Thomas Jefferson University
Jefferson College of Health Professions
Department of Occupational Therapy
901 Walnut Street, 6th Floor
Philadelphia, PA 19107
215.503.8010

REFERENCES
ENTRY LEVEL AND COMBINED BSMS OCCUPATIONAL THERAPY COURSE DESCRIPTIONS
Courses are described in numerical order. The number within parentheses following the course title indicates the number of semester credits assigned to each course.

OCCUPATIONAL THERAPY 300
Introduction to Applied Science (1)
This course introduces incoming Combined BSMS student to the process of socializing into a professional occupational therapy program. Students are introduced to and practice strategies to ensure success in a professional curriculum. Assignments reinforce content presented in concurrent first semester courses to develop students’ analysis and problem solving skills, which are used as a basis for understanding the impact of dysfunction of the musculoskeletal, central and peripheral nervous systems on an individual’s ability to perform valued occupations. Assignments facilitate the emerging skills in synthesizing these concepts and introduce students to using critical thinking in the same way as occupational therapy practitioners.

OCCUPATIONAL THERAPY 302
Applied Anatomy and Kinesiology (Lecture/Laboratory) (4)
This course provides an overview of human anatomy systems as well as principles of biomechanics and kinesiology. Study of the musculoskeletal and peripheral nervous systems regionally will facilitate the application of anatomical and biomechanical knowledge to clinical observation and activity analysis. Includes a laboratory class in surface anatomy, osteology, and kinesiology, with opportunities to practice special clinical screening tests. Lecture and laboratory.

OCCUPATIONAL THERAPY 308
Concepts in Neurodevelopment (Lecture/Laboratory) (4)
This course provides an in-depth view of the functional components of the nervous system and their functions in human performance and behavior. Laboratory experience includes examination of the brain and nervous system and identification of major structures and functions in human specimens, as well as examination of the neurobiological substrates of behavior and learning. Lecture and laboratory.

OCCUPATIONAL THERAPY 311
Health and Health Conditions (4)
This course examines common pathological conditions, diagnostic methods and medical and psychiatric treatment approaches commonly used with these disorders. Students identify the effects of disability, disease or traumatic injury to individuals and their ability to engage in occupations within the context of family and society.

OCCUPATIONAL THERAPY 321
Foundations of Occupation-Centered Practice I (Laboratory) (2)
This course introduces students to selected foundational skills used in occupation-centered practice. To develop basic competence, students engage in learning activities and practice in three modules - Basic Clinical Skills: manual muscle testing, goniometry, monitoring vital signs, transfers; Occupation and Early Development: occupational performance in infants and toddlers, influences on young children’s development; Interpersonal Foundations: group dynamics, communication, interviewing skills, Health Mentors Interprofessional team work, time management and life balance.
OCCUPATIONAL THERAPY 322
Foundations of Occupation-Centered Practice II (Laboratory) (2)
This course, a continuation of OT 321, emphasizes theoretical underpinnings and evidence based approaches within the context of occupational therapy practice. Students explore areas of occupation-based practice and relate new and innovative ideas to clinical practice. Opportunities are included to practice frequently used screening and evaluation measures and fabricate orthotic interventions for selected clinical conditions. Additionally, Health Mentors Interprofessional teamwork, occupation and typical development in children 2-7 years are included.

OCCUPATIONAL THERAPY 330
Using an Occupational Therapy Lens in the Clinic (2)
This course provides an introduction to occupational therapy in a hospital environment. Particular emphasis is placed on developing observation and professional writing skills while observing recipients of occupational therapy services in the hospital setting. Assignments promote integration of knowledge and skills presented during courses in the semester, including pathology, clinical observation skills, professional writing, professional behavior and utilization of medical data bases.

OCCUPATIONAL THERAPY 336
Occupation Through the Life Span (Lecture and Laboratory) (5)
This course examines participation in occupation as an organizing force throughout the life span and as a key determinant of health. The course emphasizes foundational skills and knowledge concerning the nature of occupation and ways that participation in occupation is affected by individual and environmental contextual factors. Problem solving and analytical skills relative to activity analysis principles and the occupational therapy process are taught in conjunction with the Occupational Therapy Practice Framework. Students apply professional tools of analyzing, selecting, grading and adapting occupations, in order to address the impact of disability and dysfunction on participation in occupations.

OCCUPATIONAL THERAPY 340
Domains of Occupational Therapy Practice – Fieldwork Level I (2)
This course provides an understanding of the parameters of occupational therapy practice through guided observation and participation in clinical and/or community settings. Particular emphasis is placed on developing and analyzing observation, clinical reasoning, interpersonal skills and professional behavior skills while observing and participating with individuals in a variety of self-care, work, social participation and leisure/play interventions.

OCCUPATIONAL THERAPY 341
Occupational Analysis and Evaluation – Fieldwork Level I (2)
This course provides opportunities for students to observe and/or participate in patient/client evaluation and intervention, and to apply their understanding of the evaluation process, activity analysis and the use of occupation in therapeutic intervention. Each student is placed in an environment that offers an opportunity to integrate didactic and clinical knowledge. Students engage in supervised observation, evaluation and intervention activities with individuals across the lifespan with a variety of conditions. Students continue to develop their clinical reasoning, professional communication and behavior skills, and therapeutic use of self through practice and guided self-reflection.
Prerequisite: OT 340
OCCUPATIONAL THERAPY 357
Evaluation Process (Lecture/Laboratory) (4)
Occupational therapy evaluation requires a therapist to develop an occupational profile and to analyze the individual’s ability to perform occupations. This course provides students with the knowledge and skills necessary for the client evaluation process according to the Occupational Therapy Practice Framework. Students learn about a range of tests and assessments that evaluate individual needs within a variety of clinical practice areas. Course emphasis includes the use of skilled clinical observation and principles of assessment selection, administration, interpretation, and scoring. Using evaluation results for the purposes of planning occupational therapy intervention and establishing therapy goals is covered. Opportunities for practicing evaluation and assessment skills are provided in the laboratory portion of the class.
Prerequisites: OT 311, OT 336

OCCUPATIONAL THERAPY 440
Interventions: Enhancing Human Performance – Fieldwork Level I (2)
This course provides an in-depth understanding of the clinical intervention process from a problem-solving perspective. Each student is placed in an environment that offers an opportunity to integrate didactic and clinical knowledge and examine the process of clinical reasoning. Emphasis is placed on treatment planning and goal development, treatment implementation, and documentation of client-centered, occupation-based care. Students also continue to hone professional behavior, clinical reasoning, and clinical skills.
Prerequisite: OT 341

OCCUPATIONAL THERAPY 441
Interventions: Enhancing Social Participation– Fieldwork Level I (2)
This course addresses the role of occupational therapy in providing psychosocial group program development and implementation in emerging, practice settings. As occupational therapists move out of medical environments and into the community, they need to apply skills in needs assessment, program development, program evaluation, consultation and marketing, as well as the ability to work independently. Students engage in developing occupation based group programming in a variety of community settings where occupational therapy services are minimally or non-existent. Each student is placed in an environment, which offers an opportunity to integrate didactic and clinical knowledge. Emphasis is placed on developing, implementing and justifying theory-based psychosocial intervention at the group program level.
Prerequisite: OT 440 (previous to or concurrent with OT 558)

OCCUPATIONAL THERAPY 467
Health Service Administration and Professional Development (2)
This course addresses the knowledge needed to be a professional occupational therapist within complex systems at the staff level and at various levels of management. Key focus areas include: structure of healthcare organizations, management and evaluation of programs, supervision methods and guidelines, funding and reimbursement mechanisms for services and the influence of external factors such as policy, law and social trends. Professional development trajectories and concepts of ethical practice and ethical problem-solving are presented. These issues and the roles and responsibilities of the occupational therapist will be analyzed within the contexts of current occupational therapy environments of practice in healthcare, education and social service systems.
OCCUPATIONAL THERAPY 480
Fieldwork Level II A (6)
The full-time, 12 week supervised fieldwork experience emphasizes the application of the academically acquired body of knowledge. This clinical affiliation will provide an in-depth experience in the practice and application of the occupational therapy process with individuals who are experiencing deficits in occupational performance or are at-risk for occupational dysfunction as a result of physical, psychosocial, developmental, learning or cognitive factors. Fieldwork placements will include traditional and/or community-based delivery systems.
Concurrent with OT 578

OCCUPATIONAL THERAPY 482
Fieldwork Level II B (6)
The full-time, 12 week supervised fieldwork experience emphasizes the application of the academically acquired body of knowledge. This clinical affiliation will provide an in-depth experience in the practice and application of the occupational therapy process with individuals who are experiencing deficits in occupational performance or are at-risk for occupational dysfunction as a result of physical, psychosocial, developmental, learning or cognitive factors. Fieldwork placements will include traditional and/or community-based delivery systems.
Pre requisite: OT 480
Concurrent with OT 579

GRADUATE PROGRAM COURSES
OCCUPATIONAL THERAPY 552
Interventions: Enhancing Human Performance (Lecture/Laboratory) (5)
Focuses on the development of knowledge and skills needed for the client intervention process as outlined in the Occupational Therapy Practice Framework (development of the intervention plan, intervention implementation and intervention review). Students will learn how to identify the need for occupational therapy services, develop intervention plans, goals and outcomes, review intervention and prepare for termination of services. Emphasis is placed on the selection and implementation of intervention methodologies that are clinically sound, stage-specific, client-centered, evidence-based, and theory-guided. The laboratory portion of the course allows students to practice and apply a broad range of intervention techniques utilizing therapeutic use of self, occupation-based activities, purposeful activities, preparatory methods and educational processes that can enhance the occupational performance and health of adults and children.
Prerequisites: OT 302, OT 308, OT 311, OT 336, OT 357

OCCUPATIONAL THERAPY 555
Older Adults and Their Living Environments (3)
This elective course provides an in-depth understanding of older adults and the social, physical and virtual environments in which they live and interact, across the continuum of care. Students learn to evaluate different environments such as the home, senior centers and assisted living facilities for their supports and constraints on occupational performance of older adults with a range of physical and cognitive conditions. Analyzes interrelationships between client factors and environmental contexts using person-environment theoretical frameworks and examines implications for occupational therapy intervention and research.
OCCUPATIONAL THERAPY 558
Interventions: Enhancing Social Participation (3)
This intervention based course encourages students to examine and build knowledge and skills in the delivery of psychosocial, preventative and health and wellness interventions used in occupational therapy practice. Students analyze personal and professional behavior skills while engaging in didactic and small group activities to develop and apply their clinical reasoning. Students also explore the theoretical premise and practice application of individual, group and consultation psychosocial interventions used by occupational therapists in traditional, community based and emerging practice settings within the constructs of the Occupational Therapy Practice Framework (OTPF 3). In laboratory sessions, students participate and reflect upon the development, implementation and effectiveness of activity-based groups. Students collaborate, design and implement evidence and occupation-based activity sessions that are developmentally sensitive to social participation while adhering to a theoretical base.
Concurrent with OT 441

OCCUPATIONAL THERAPY 560
Environmental Competence (3)
This intervention course focuses on exploring the dynamic interaction between the person, the environment, and participation in occupations. Students analyze this interaction by assessing context, client factors, performance skills and patterns, & activity demands that enable participation in meaningful occupations. Students problem solve environmental modifications to enable all people to participate in meaningful occupations and promote health.
Prerequisites: OT 311, OT 336
Concurrent with OT 561 and 562

OCCUPATIONAL THERAPY 561
Environmental Competence Laboratory (1)
This is a laboratory course in which students problem-solve to create client-centered environmental adaptations in a variety of settings. Focus is on evaluation, selection, implementation and coordination of human and non-human environmental adaptations to enable occupational performance in accordance with roles, goals, motivation, interests, habits and abilities. Concepts of environmental adaptation are applied at the individual, community, and societal levels.
Prerequisites: OT 311, OT 336
Concurrent with OT 560 and 562

OCCUPATIONAL THERAPY 562
Environmental Competence in Action (1)
Students work directly and collaboratively with an individual client in the community to apply concepts from OT 560 Environmental Competence. Students design, fabricate and implement environmental adaptations, and develop strategies to successfully incorporate these adaptations into the individual’s daily routines. Students develop their clinical reasoning and problem solving abilities as they are guided through this process by regular meetings with a faculty preceptor.
Prerequisites: OT 311, OT 336
Concurrent with OT 560 and 561
OCCUPATIONAL THERAPY 577
Historical Perspectives on Theory-Based Practice in Occupational Therapy (3)
This course offers students the opportunity to understand the relationship between social, cultural, economic, political and scientific forces in society and the profession of occupational therapy. Students increase their awareness of how internal and external pressures have influenced the evolution of the field of occupational therapy in the past, present and into the future. Students trace the development of selected occupational therapy paradigms, models and theories as evidenced in the occupational therapy literature using methods associated with theoretical analysis. Core concepts and constructs (such as occupation, competence, environment and adaptation) that form the basis of contemporary practice models and theories are identified, as well as those that may emerge and influence the future directions of the profession. Students compare the values, knowledge and skills reflected in these concepts and critique evidence of practice based and research based application.

OCCUPATIONAL THERAPY 578
Evidence Based Practice I (1)
OT 578 is an asynchronous on-line course taken simultaneously with OT 480. Students analyze their clinical practice during Level II Fieldwork through reflection, clinical reasoning, and the application of the best available evidence to solve clinical problems. Students learn to appreciate and analyze the unique aspects of the client, the therapist, the health care delivery system, and apply relevant theory, evidence, and clinical reasoning to validate practice decisions and/or reframe patient problems and therapy intervention. In addition to other web-based learning activities, students generate clinical/practice questions derived from their current practice arena, search the evidence, and appraise abstracts relevant to their patient/client/population.

OCCUPATIONAL THERAPY 579
Evidence Based Practice II (1)
Students continue to analyze their clinical practice during their second Level II Fieldwork experience through reflection, clinical reasoning, and the application of the best available evidence to solve clinical problems. This on-line asynchronous course, taken simultaneously with OT 482, offers students guidance and opportunity to transfer developing EBP skills and behaviors in a new practice environment. In addition to other web-based learning activities, students generate clinical/practice questions derived from their current practice arena and conduct in-depth literature reviews, critical analysis, and synthesis of the best available evidence to facilitate and promote EBP in the workplace.

OCCUPATIONAL THERAPY 600
Occupational Therapy Professional Seminar (1)
This seminar course introduces students to the wide scope of the profession’s domain of concern; specifically participation in daily meaningful occupations, occupational justice; primary care practice; and professional power. Through discussion, readings, and other learning activities, students begin their enculturation to the profession and developing an identity as members of the profession. Students are introduced to an evidence-based, systematic method of problem solving and use of critical thinking and analysis skills in proposing solutions to issues facing the profession in the healthcare environment today.

OCCUPATIONAL THERAPY 603
Research Methods and Mentorship (4)
This course will address the interrelationships between theory, research and practice. Emphasis will be placed on the acquisition of methods for extending the scientific base of knowledge for advanced
occupational therapy practice and for incorporating the use of evidence based practice into practice. Qualitative, quantitative, and mixed method research designs and related analytic techniques for appraising research evidence will be examined in terms of their appropriateness for advancing knowledge of occupation and for addressing various research problems in occupational therapy. Learning methods include class activities, readings, critique of published studies, literature search and data analysis.

OCCUPATIONAL THERAPY 627
Program Design and Evaluation (3)
The role of the healthcare provider as a program developer, evaluator and consultant is covered in this course. Students develop introductory knowledge and skill in the processes and techniques of program design and evaluation needed to add to services traditionally provided in a setting or to plan new programs.

OCCUPATIONAL THERAPY 631
Focus on the Child in Early Intervention and School Based Practice (3)
The occupational therapy process with infants, toddlers and the school-aged child within the context of his or her natural environment is examined. Students learn to use a family centered, interdisciplinary approach to early intervention and school-based practice. A variety of assessment and intervention strategies for the young and school-aged child are included. Students integrate and apply current literature related to the occupational therapy process, natural environments, legislation, school system policy and organization, the use of sensory integration and family-centered care.

OCCUPATIONAL THERAPY 670
Advanced Research Seminar (3)
This seminar provides an opportunity for learners to apply research skills to answer clinical questions that affect the provision of occupational therapy services. Learners have the opportunity to develop a professional workshop to enhance the professional development of a small group of peers. Learners obtain an advanced understanding of important methodological considerations needed to design and complete projects for professional audiences. Prerequisites: Occupational Therapy 578, 579, 603

OCCUPATIONAL THERAPY 682
Clinical Leadership (3)
Utilizes conceptual frameworks for guiding development as leaders in occupational therapy practice, research, education, advocacy, and administration. Explores and expands the knowledge and skills necessary for occupational therapists to assume leadership roles in a wide range of practice and research arenas.

DOCTORAL AND ADVANCED PRACTICE CERTIFICATE COURSES
All courses can be viewed at the following:
Physical Therapy
DEPARTMENT OF PHYSICAL THERAPY

Physical therapy is a dynamic, multifaceted profession with an established theoretical and scientific base. Today’s physical therapists care for people across the lifespan, from premature infants to the elderly, to restore, maintain and promote optimal physical function. In addition to being experts in examination and treatment of musculoskeletal, neuromuscular, cardiovascular/pulmonary and integumentary problems that affect people’s ability to function optimally, physical therapists are skilled in prevention and health maintenance techniques employed to assure maximum health, wellness and fitness.

The mission of the Department of Physical Therapy, which is congruent with the missions of the College and University, guide the strategic plan and faculty goals in the Department. The mission and goals of the Department of Physical Therapy bring an interprofessional emphasis to education, research, health care delivery and service to the community and profession:

- **Educational Mission:** To graduate highly competent self-reflective physical therapists that practice evidence-based physical therapy, who are patient advocates and leaders in the community and the profession, and who are prepared to treat a culturally diverse population of clients and pursue professional development opportunities.
- **Research Mission:** To add to the body of knowledge in physical therapy by conducting and disseminating research along a continuum from basic sciences to application
- **Service Mission:** To utilize physical therapy knowledge and skills to benefit the community and the profession

DOCTOR OF PHYSICAL THERAPY DEGREE PROGRAM

The Doctor of Physical Therapy Degree Program is a post-baccalaureate program based upon a clinical problem-solving approach and integrated with a health and wellness model. In addition to preparing physical therapists that can recognize and apply the concept of individual responsibility for personal health in health promotion and disease, the DPT program strives to prepare life-long learners who utilize evidence-based practice to treat clients with optimal physical therapy interventions. Students are expected to integrate theory, practice and research within a problem-solving approach employing scientific knowledge, humanistic values, critical analysis and a systematic approach to making clinical decisions. The DPT program places a strong emphasis on teaching skills that better prepare students to adapt to a rapidly changing healthcare environment and professional behaviors that embody those advocated in the APTA Code of Ethics and Professional Conduct.

Upon successful completion of the program, students are awarded the Doctor of Physical Therapy degree.

PROGRAM ACCREDITATION

The entry-level DPT program is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), American Physical Therapy Association (APTA). Information about CAPTE rules and procedures regarding any DPT program accreditation concerns is found in the Accreditation Handbook on the CAPTE website (www.apta.org/capte).
### CURRICULUM (DPT) FOR THE CLASS OF 2016

**First Year**

**FALL SEMESTER (15-16 wks: September – December)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PT 503</td>
<td>Advanced Human Anatomy</td>
<td>3</td>
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<tr>
<td>PT 506</td>
<td>Biomechanics and Kinesiology</td>
<td>4</td>
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<td>PT 511</td>
<td>Clinical Physiology I</td>
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<tr>
<td>PT 531</td>
<td>Clinical and Professional Skills I</td>
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<tr>
<td>PT 541</td>
<td>Physical Therapists as Learners and Teachers</td>
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**SPRING SEMESTER (15-16 wks: January – May)**

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<tr>
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<td>PT 504</td>
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<td>PT 526</td>
<td>Critical Inquiry I</td>
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<td>Clinical and Professional Skills II</td>
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<td>PT 607</td>
<td>Musculoskeletal Physical Therapy I</td>
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**Second Year**

**PRE-FALL SEMESTER (10 wks: ½ June – August)**

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<tr>
<td>PT 553</td>
<td>Modalities and Physical Agents</td>
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<td>PT 611</td>
<td>Cardiovascular and Pulmonary Physical Therapy</td>
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<tr>
<td>PT 613</td>
<td>Pharmacology</td>
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<td>PT 680</td>
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**FALL SEMESTER A (8 wks: September – October)**

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<tr>
<td>PT 681</td>
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**FALL SEMESTER B (8 wks: November – December)**

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<td>PT 521</td>
<td>Motor Function Throughout the Lifespan</td>
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<td>PT 608</td>
<td>Musculoskeletal Physical Therapy II</td>
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<td>PT 626</td>
<td>Critical Inquiry II</td>
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<td>PT 661</td>
<td>Physical Therapy for the Integumentary System</td>
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**SPRING SEMESTER (12 wks: January – March)**

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<td>PT 601</td>
<td>Rehabilitation: Continuum of Care</td>
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<td>PT 609</td>
<td>Musculoskeletal Physical Therapy III</td>
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<td>PT 616</td>
<td>Neuromuscular Physical Therapy I</td>
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<td>PT 631</td>
<td>Healthcare Delivery Systems</td>
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**PRE-SUMMER SESSION (8 wks: April - May)**

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<td>PT 682</td>
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Third Year

PRE-FALL / FALL A SEMESTER (14 wks: July - ½ October)
PT 627  Critical Inquiry III  3
PT 646  Clinical Physiology III  3
PT 674  Physical Therapy Clinical Decision Making in Pediatrics  3
PT 716  Neuromuscular Physical Therapy II  3

FALL SEMESTER B (10 wks: ½ October – December)
PT 781  Clinical Affiliation III  5

SPRING SEMESTER (15-16 wks: January – April)
PT 651  Applied Exercise Physiology  3
PT 670  Prosthetics and Orthotic Intervention  3
PT 736  Business and Leadership in Physical Therapy Practice  3
PT 741  Comprehensive PT Clinical Decision Making  4
PT 774  Physical Therapy Clinical Decision Making in Geriatrics  3

SUMMER SESSION (10 wks: May – August)
PT 782  Clinical Affiliation IV  5

Credit Summary
First-Year Professional Credits  35
Second-Year Professional Credits  38
Third-Year Professional Credits  38
Total Credits for Doctor of Physical Therapy Degree Program  111
## CURRICULUM (DPT) FOR THE CLASSES OF 2017 AND BEYOND

### First Year

#### PRE-FALL SEMESTER (8 wks: July – August)

<table>
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<tr>
<th>Course Code</th>
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<td>PT 527</td>
<td>Critical Inquiry I</td>
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<td>PT 534</td>
<td>PT Practice Issues: Introduction to Physical Therapy Profession (Online)</td>
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<td>PT 536</td>
<td>PT Practice Issues: Language of Practice I (Online)</td>
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#### FALL SEMESTER (16 wks: September – December)

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<td>PT 533</td>
<td>Introduction to Physical Therapy Examination</td>
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<td>PT 538</td>
<td>PT Practice Issues: PT as Teachers and Learners/Psychosocial Aspects of Patient Care</td>
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<td>PT 539</td>
<td>PT Practice Issues: Clinical Decision Making</td>
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#### SPRING SEMESTER (15-16 wks: January – May)

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<td>PT 556</td>
<td>Therapeutic Exercise</td>
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### Second Year

#### PRE-FALL SEMESTER (10 wks: ½ May – July)

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#### FALL SEMESTER A (8 wks: August – September)

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<tr>
<td>PT 681</td>
<td>Clinical Affiliation I</td>
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#### FALL SEMESTER B (11 wks: October – ½ December)

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PT 608</td>
<td>Musculoskeletal Physical Therapy II</td>
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<tr>
<td>PT 621</td>
<td>Neuromuscular Physical Therapy I</td>
<td>5</td>
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<td>PT 624</td>
<td>Critical Inquiry II</td>
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<tr>
<td>PT 670</td>
<td>Prosthetics and Orthotic Intervention</td>
<td>3</td>
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#### SPRING SEMESTER A (8 wks: January – February)

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PT 682</td>
<td>Clinical Affiliation II</td>
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#### SPRING SEMESTER B (11 wks: March – ½ May)

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PT 609</td>
<td>Musculoskeletal Physical Therapy III</td>
<td>2</td>
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<tr>
<td>PT 622</td>
<td>Neuromuscular Physical Therapy II</td>
<td>4</td>
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<tr>
<td>PT 641</td>
<td>Capstone Project I</td>
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</tr>
<tr>
<td>PT 661</td>
<td>Physical Therapy for the Integumentary System</td>
<td>2</td>
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</table>
PT 674  Physical Therapy Clinical Decision Making in Pediatrics 3

Third Year
PRE-FALL (10 wks: June - ½ August)
PT 781  Clinical Affiliation III 5

FALL SEMESTER (16 wks: September – December)
PT 631  Healthcare Delivery Systems 2
PT 705  Comprehensive Case Analysis I 2
PT 710  Capstone Project II 1
PT 721  Differential Diagnosis 2
PT 736  Business and Leadership in Physical Therapy Practice 3
PT 774  Physical Therapy Clinical Decision Making in Geriatrics 3
PT xxx  Electives 2 - 5
15 +

SPRING SEMESTER A (6 wks: January – ½ February, first week of May)
PT 711  Capstone Project III (Return for 1 week immediately following PT 782) 1
PT 730  PT Practice Issues: Advocacy, Professional Association 1
PT 706  Comprehensive Case Analysis II 1
PT xxx  Electives 2 - 5

SPRING SEMESTER B (10 wks: ½ February – April)
PT 782  Clinical Affiliation IV 5
10 +

Credit Summary (Required)
First-Year Professional Credits 39
Second-Year Professional Credits 43
Third-Year Professional Credits 30
Total Credits for Doctor of Physical Therapy Degree Program 112

Descriptions for the courses listed above are located at the end of this section of the Catalog.
DEPARTMENT OF PHYSICAL THERAPY FACULTY

Core Faculty
Susan Flannery Wainwright, PT, PhD
   Associate Professor and Chair
Susan V. Duff, PT, OT, EdD
   Associate Professor
Paul D. Howard, PT, PhD, OCS
   Associate Professor
Therese Johnston PT, PhD, MBA
   Associate Professor
Kim Nixon-Cave, PT, PhD, PCS
   Associate Professor and Director, DPT and Post Professional Educational Programs
Christine Wade, PT, RN, EdD
   Associate Professor
Leigh Ann Hewston, PT, MEd
   Assistant Professor
Louis N. Hunter, PT, DPT
   Assistant Professor
Janet Jackson-Coty, PT, DPT, PCS
   Assistant Professor and Co-Director of Clinical Education
Laura Krisa, PhD
   Assistant Professor
Stephanie Muth, PT, PhD
   Assistant Professor
Janette Scardillo PT, DPT, CBIS
   Assistant Professor and Co-Director of Clinical Education
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   Assistant Professor

Associated Faculty
Leonard Eisenman, PhD
   Professor
Richard R. Schmidt, PhD
   Professor
Gina DeSevo, PharmD
   Assistant Professor
Robert Cullen, PT, MBA, JD
   Clinical Assistant Professor
Shannon McLaughlin PT, DPT, DCS
   Clinical Assistant Professor
Guiyun Zhang MD, PhD
   Instructor
Timothy Bayruns, PT, DPT, OCS, CSCS
   Teaching Associate
Lisa Goodfriend, PT, MPT, CWS, FACCWS
Teaching Associate

Joseph Ricci, MPT
Teaching Associate

Frank Angiolillo, PT, OCS, Cert MDT
Laboratory Teaching Assistant

Michele Berman, PT, DPT
Laboratory Teaching Assistant

Cheryl Cocca, PT, DPT, OCS
Laboratory Teaching Assistant

Lynn C. Davis, PT, MPT
Laboratory Teaching Assistant

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Laboratory Teaching Assistant

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Amanda Morina PT, NCS
Laboratory Teaching Assistant

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Laboratory Teaching Assistant

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Laboratory Teaching Assistant

Natalie Sibley, PT, DPT
Laboratory Teaching Assistant

Elizabeth Singh, DPT
Laboratory Teaching Assistant

Kelly Welsh, PT, DPT
Laboratory Teaching Assistant

Brian Wolfram, PT, DPT
Laboratory Teaching Assistant

DEPARTMENT OF PHYSICAL THERAPY STAFF
Dana Cardona, Administrative Assistant to the Faculty
JoAnn Cecchetti, Administrative Assistant to the Chair
Michele Hatton, Administrative Assistant to Clinical Education

DEPARTMENT OF PHYSICAL THERAPY CONTACT INFORMATION
Thomas Jefferson University, College of Health Professions
Department of Physical Therapy
901 Walnut Street, 5th Floor, Philadelphia, PA 19107
PHYSICAL THERAPY COURSE DESCRIPTIONS
Courses are described in numerical order. The number within parentheses following the course title indicates the number of semester credits assigned to each course. For the Doctor of Physical Therapy program, all courses have as a prerequisite requirement academic good standing according to the Special Program Requirements in addition to those prerequisites listed following the course descriptions.

PHYSICAL THERAPY 503
Advanced Human Anatomy (3)
This course represents the lecture portion of Advanced Human Anatomy and precedes the dissection portion which follows in the succeeding term. Students will be exposed to a rigorous academic experience in which they will obtain a firm and thorough foundation in basic human gross anatomy. Students will also approach the study of human anatomy utilizing several imaging modalities, e.g., CT, MRI and radiographic films. Lecturers will be from the Division of Anatomy in the Department of Pathology, Anatomy & Cell Biology and from the Department of Physical Therapy in the Jefferson College of Health Professions.

PHYSICAL THERAPY 504
Human Anatomy Laboratory (3)
In-depth study of the human body with emphasis on providing an anatomical foundation as a basis for normal and abnormal function for the physical therapist of the future. Laboratory experience is linked to PT 503. Includes a short review of the anatomical region/area prior to laboratory experiences, which will focus primarily on directed cadaver dissection, with examination of skeletal materials, anatomical models and imaging. Emphasizes the musculoskeletal system and the importance of the structural interrelationships. Covers the thoraco-abdominal viscera and the head and neck regions to provide the necessary background for integration and a more complete appreciation of the human body.
Prerequisite: Physical Therapy 503

PHYSICAL THERAPY 506
Biomechanics and Kinesiology (4)
The purpose of this course is to examine the basic principles of human motion based on anatomy, physiology, physics and mechanics. The course has been designed to closely correlate with the gross anatomy sequence. Students will examine the static and dynamic relationship between structure and function of the neuromusculoskeletal system under normal and abnormal conditions. Topics include basic biomechanical principles, tissue response to biomechanical forces, muscle and joint mechanics and kinetic and kinematic concepts of motion analysis as they apply to a specific joint region and/or whole body movement patterns. Changes throughout the life span as they apply to biomechanics and kinesiology will be examined at a very basic level. The laboratory portion of this course includes participation in both qualitative and quantitative movement analyses at each joint complex and of the entire body during functional activities such as reaching, manipulating objects, stair climbing, lifting and gait. Qualitative movement analysis will be performed via palpation and observation of movement. Quantitative movement analysis will be performed primarily by solving biomechanical problems. Students will also be introduced to quantitative analysis systems in our Human Performance Laboratory (HPL). Students will utilize case studies to apply biomechanical principles and functional anatomy to a diverse selection of case studies. The laboratory portion of the course reinforces basic biomechanical and kinesiological principles to functional tasks and patient problems. Students will also develop and improve problem solving and clinical decision-making skills through application of kinesiological and
biomechanical principles to case studies. Students work in small groups analyzing an activity and share their findings with the class.

**PHYSICAL THERAPY 513**
**Pathophysiology I (3)**
This three credit course is the first of a two-course sequence that will present an overview of the pathophysiology of disorders frequently encountered by physical therapists, particularly those affecting the musculoskeletal and neuromuscular systems. This course is structured to integrate physiologic principles with these pathologic processes. Disease processes across the life span are presented. Medical diagnostic tests, lab values and basic pharmacologic intervention are discussed. The course will emphasize the relationships of pathological processes to patient symptoms and function through the lifespan, as well as medical intervention. Clinical cases are presented to reinforce the relevance to physical therapy practice.

**PHYSICAL THERAPY 514**
**Pathophysiology II (3)**
This three credit course is the second of a two-course sequence that will present an overview of the pathophysiology of disorders frequently encountered by physical therapists, particularly those affecting the gastrointestinal, genitoureproductive, urologic, cardiovascular and respiratory, and integumentary systems, as well as other major clinical medicine disorders such as infectious disease and oncology. This course is structured to integrate physiologic principles with these pathologic processes. Disease processes across the life span are presented. Medical diagnostic tests, lab values and basic pharmacologic intervention are discussed. The course will emphasize the relationships of pathological processes to patient symptoms and function through the lifespan, as well as medical intervention. Clinical cases are presented to reinforce the relevance to physical therapy practice.

**PHYSICAL THERAPY 517**
**Neuroscience (4)**
A study of the basic principles and concepts related to the nervous system. The development and changes of the nervous system, and subsequently the individual, across the life span provides the foundation for understanding brain behavior relationships. Emphasis is placed on the role of the nervous system in normal physiologic function, with particular emphasis on sensorimotor behavior inclusive of motor development, motor learning and motor control theory. Neuroanatomy, neurophysiology, and an introduction to neuropathology are included.

**PHYSICAL THERAPY 527**
**Critical Inquiry I (3)**
This course is designed to present quantitative and qualitative research design and statistical analysis with the intent to assist the student in critically evaluating the primary literature and applying the principles of measurement consistent with the Patient/Client Management Model. Common research methods and designs are discussed and applied to clinical problems. Quantitative and qualitative statistical analyses will be reviewed with the goal of comprehension and interpretation. Quantitative, qualitative, and mixed methods designs will be compared and contrasted, with the goal of developing an appreciation of comprehensive and clinically meaningful research.
PHYSICAL THERAPY 533
Introduction to Physical Therapy Examination (5)
This foundational course introduces the student to basic clinical examination techniques, tests and measures. Course content will build a foundation for future course work. The laboratory portion of the course includes participation/practice in the psychomotor components of the examination techniques, including tests and measures. Students will develop and improve problem solving skills and clinical decision-making skills through performance of tests and measures by applying them to case studies. This course also focuses on verbal, nonverbal and written communication for professional interactions with patients, caregivers and other health care providers. Students will have an opportunity to interact with a mentor, a person in the community who is living with a chronic health condition, and other health care professional students through the Jefferson Center for Interprofessional Education (JCIPE) Health Mentor Program. Written documentation will build on terminology in the patient/client management model to introduce SOAP note format as a part of evaluation and progress notes.

PHYSICAL THERAPY 534
PT Practice Issues: Introduction to the Physical Therapy Profession (Online) (1)
PT Practice Issues is a series of one credit courses that introduces students to various aspects of physical therapist practice. This course focuses on the evolution of physical therapy as a profession, its history, standards of the profession, the APTA Core Values of Professionalism, the Guide to Physical Therapist Practice and APTA Code of Ethics. The student is provided with a historical perspective of professionalism and the maturation of physical therapy as a doctoring profession, reflected in APTA and state practice guidelines. The course provides an introduction to the World Health Organization International Classification of Functioning Disability and Health (WHO-ICF) as a clinical decision making framework under which the concept of disease is a part of the continuum of health. Physical therapists view the patient as a person who functions in relation to his/her personal and cultural makeup and health condition within the framework of the environment.

PHYSICAL THERAPY 536
PT Practice Issues: Language of Practice I (Online) (1)
PT Practice Issues is a series of one credit courses that introduces students to various aspects of physical therapist practice. This course focuses on medical terminology, an essential foundation in communication of physical therapists. Using a body systems approach students will learn the building blocks of prefixes, suffixes, roots, combining forms and abbreviations. Through self-directed learning students will define, interpret, and pronounce medical terms related to structure and function, pathology, movement, examination, diagnosis, prognosis, intervention and clinical procedures.

PHYSICAL THERAPY 538
PT Practice Issues: Psychosocial Aspects of Physical Therapy & Physical Therapists as Teachers and Learners (2)
PT Practice Issues is a series of courses that focus on various aspects of fulfilling the role of a physical therapist. This course focuses on managing individual needs during illness and disease as well as ways to successfully interact with and enhance wellness of patients and families in health care settings. A variety of topics will be presented through readings, lectures, discussions and experiential activities. Topics include: a person’s needs during disability and acute as well as chronic illness, mind-body relationship, complementary and alternative medicine, and death and dying. This course will also focus on the physical therapist as a teacher and learner in various contexts highlighting roles in the clinic and community and the patient’s role in effecting health behavior change.
PHYSICAL THERAPY 539
PT Practice Issues: Clinical Decision Making (1)
PT Practice Issues is a series of one credit courses that focuses on various aspects of fulfilling the role of a physical therapist. Students will explore clinical decision making models used in physical therapy. Through case studies, students will be presented with diagnoses across the four practice patterns: cardiopulmonary, integumentary, musculoskeletal, and neuromuscular. Students will apply clinical decision making models to address clinical dilemmas in simple case scenarios. Students will also explore use of self-assessment and reflection throughout the clinical decision making process.

PHYSICAL THERAPY 553
Modalities and Physical Agents (3)
The Physical Agents and Electrical Modalities course is required of all physical therapy students. This course provides knowledge of the principles, technology, and general applications of thermal agents, intermittent pneumatic compression and electrotherapy. Indications and contraindications for the management of clinical conditions including pain, edema, inflammation, wounds, decreased range of motion, and muscle weakness will be discussed. Clinical decision-making will be emphasized in lecture, small group activities, and laboratory sessions.

PHYSICAL THERAPY 556
Therapeutic Exercise (3)
This course will focus on the foundational principles of therapeutic exercise. Students will apply the use of systematic performance or planned physical movements, postures or activities to (1) remediate or prevent impairments, (2) enhance function, (3) reduce risk, (4) optimize overall health, and (5) enhance fitness and well-being. Students will begin to use clinical reasoning to apply exercise interventions to meet patient/client goals and outcomes. The ultimate goal of the course is to prepare students in this foundational knowledge and skill so they are able to develop and deliver comprehensive plans of care within the preferred practice patterns, and encompassing the lifespan, in the advanced courses of the curriculum.

PHYSICAL THERAPY 607
Musculoskeletal PT I (3)
Examination and intervention approaches for the lumbar spine, sacroiliac region, hip, knee, and ankle/foot will be presented. There is a major emphasis on soft tissue examination and manual therapy techniques.
Prerequisites: Physical Therapy 503, 506, 531

PHYSICAL THERAPY 608
Musculoskeletal PT II (2)
Various physical therapy approaches to examination and intervention for musculoskeletal disorders related to the temporomandibular joint, cervical spine, thoracic spine, and pelvic diaphragm will be discussed and critically analyzed in this course. A major emphasis of this course is to instruct students in methods of teaching patients how to effectively treat/manage their orthopaedic disorders and prevent reoccurrence. Soft tissue examination and manual therapy provide the foundation for this course.
Prerequisite: Physical Therapy 607
PHYSICAL THERAPY 609
Musculoskeletal PT III (2)
Various physical therapy approaches to examination and intervention for disorders related to the shoulder, elbow, wrist, and hand will be discussed and critically reviewed in this course. A major emphasis of this course is to instruct students in methods of teaching patients how to effectively manage their orthopaedic disorders and prevent reoccurrence. Soft tissue examination and manual therapy techniques provide the foundation for this course.
Prerequisite: Physical Therapy 608

PHYSICAL THERAPY 611
Cardiovascular and Pulmonary Physical Therapy (5)
Students are instructed in basic examination, evaluation, intervention, diagnosis, and outcome assessment skills of the cardiopulmonary and lymphatic system. Particular attention is focused on exercise prescriptions, patient management in various clinical settings, current medical and surgical procedures, and guidelines and education for inpatient and outpatient rehabilitation. Students will use evidence based practice to guide decisions for developing a plan of care.

PHYSICAL THERAPY 613
Pharmacology (2)
Provides an overview of drug classifications, the physiologic basis for their actions and examines the synergistic and/or adverse effects to patient’s rehabilitation goals.

PHYSICAL THERAPY 621
Neuromuscular Physical Therapy I (5)
This is the first of two courses focusing on the physical therapy examination and intervention of patients/clients with neuromuscular dysfunction. Students will learn key skills as part of the examination, evaluation, diagnosis, prognosis and intervention process to improve overall function, activity and participation of their clients. Environmental and personal factors will be taken into account.

PHYSICAL THERAPY 622
Neuromuscular Physical Therapy II (4)
This is the second of two courses focusing on the physical therapy examination and treatment of people with neuromuscular diagnoses. Students will learn key skills as part of the examination, evaluation, diagnosis, prognosis and intervention process to improve overall function, activity and participation of their clients while taking environmental and personal factors into account.

PHYSICAL THERAPY 624
Critical Inquiry II (2)
This course introduces the process and implementation of critical inquiry as an important component of effective Physical Therapy practice. Students learn how to use the breadth of evidence in practice, methods for searching the literature, principles of measurement, uses and usefulness of results as presented in published studies, and the creation of a personal library of critically appraised topics. A journal club format will be used to orient the students to the process of evaluation and synthesis of research results into practice.
PHYSICAL THERAPY 627
Critical Inquiry III (3)
Guides students through the process of developing a Systematic Review of the Literature, on a topic to be selected by the faculty. Students learn to apply principles of research to the clinical decision making process and to document clearly and objectively the critique and recommendations for practice, based on their review of the literature. Introduces common methods of analysis for evidence-based practice and for synthesis of multiple studies. Instructs students on creation of practice guidelines.
Prerequisite: Physical Therapy 626

PHYSICAL THERAPY 631
Health Care Delivery Systems (2)
Advances students’ knowledge of physical therapy practice by synthesizing knowledge about health care as an established social institution. Emphasizes examination of the health care delivery system. Explores issues and trends associated with health care and the implications for physical therapy practice.

PHYSICAL THERAPY 641
Capstone Project I (1)
This is the first course in a three course sequence. Students will work in collaboration with faculty to complete a capstone project to meet program requirements for graduation. Students will develop a contract and initiate a project within the categories of clinical practice, teaching, scholarship or administration. This phase of the capstone project includes development of a research question, completion of a comprehensive literature review and a draft of a literature synthesis specific to the selected topic.

PHYSICAL THERAPY 646
Clinical Physiology III (3)
It is important for practicing physical therapists to recognize common diseases and conditions that may be present for a given client or situations that may preclude physical intervention. In order to fully appreciate the consequence of common diseases or conditions one must understand basic physiology and how it is altered with pathology. This course is structured to present basic physiologic principles, and then to integrate these principles with pathologic processes. Topics are organized according to systems including relevant lab values and pharmacology. Clinical cases are periodically presented to reinforce the relevance to physical therapy practice.
Prerequisite: Physical Therapy 512

PHYSICAL THERAPY 651
Applied Exercise Physiology (3)
This course applies the principles of Medical Physiology and other clinical courses in which conditions/diseases are discussed in relation to the exercise as an intervention. The principles of exercise physiology (metabolic, cardiovascular, pulmonary, muscular), already addressed in Medical Physiology will be included with additional detail and in special populations. Students will practice both submaximal exercise testing and pulmonary function testing in the laboratory as well as participating in a core training exercise class. Exercise prescription and goal setting will be practiced for patients with selected pathologies; students will be assisted in developing unique programs for those populations by clinical advisors by working through case histories. Concepts of normal nutrition and its impact on pathology are discussed relative to athletes as well as selected patient populations.
Prerequisite: Physical Therapy 646
PHYSICAL THERAPY 661
Physical Therapy for the Integumentary System (3)
The integumentary system is an integral part of neuromuscular, musculoskeletal and cardiopulmonary practice. Because of this widespread influence, physical therapists should be well informed regarding how the integumentary system fits into all phases of practice. This course is structured to provide the student with basic knowledge of the integumentary system, what to examine and how to intervene when pathology is present. Selected modalities are reviewed and discussed as specific interventions for the integumentary system. The content is primarily delivered in lecture format and analysis of selected cases presented to the student. Common pathologic integumentary conditions are presented in relation to other musculoskeletal, neuromuscular, and cardiovascular pathologies. Students are also exposed to common skin conditions and cancer.

PHYSICAL THERAPY 670
Prosthetic and Orthotic Intervention (3)
Examines the application of prosthetic and orthotic components, alignment, fabrication, and fitting, gait analysis and exercise programs. Students learn to integrate new information with previous knowledge to enable them to select appropriate examination tests and measures, evaluate, diagnose, prognose, create functional goals, and create a comprehensive plan of care for patients or clients who use a prosthesis or orthosis.

PHYSICAL THERAPY 674
Physical Therapy Clinical Decision Making in Pediatrics (3)
Students develop a complete physical therapy plan of care for a number of patients from neonate through age 21 in a variety of practice circumstances and practice settings such as NICU, school system, acute care, home or institution. Students practice the psychomotor and communication skills involved in working with children in laboratory and centers.

PHYSICAL THERAPY 680
Clinical Education Seminar (1)
Classroom instruction to prepare students for the clinical education experience. Students learn about professionalism, communication, planning and developing educational presentations, and self and peer evaluation. Students also develop an understanding of health care regulations as it relates to physical therapy practice.

PHYSICAL THERAPY 681
Clinical Affiliation I (4)
This is the first full time, eight-week clinical affiliation and provides the student the opportunity to work under the direction of a licensed physical therapist to master the beginning competencies in the foundations of physical therapy practice. This affiliation takes place during the academic year and serves to integrate the academic point in the curriculum.

PHYSICAL THERAPY 682
Clinical Affiliation II (4)
Classroom instruction related to the clinical experiences, self and peer evaluations and educational presentations is followed by an eight-week clinical affiliation in a variety of clinical settings (i.e. rehabilitation, orthopedics, neurology, geriatrics, acute care). Incorporates advanced coursework and
clinical skills. Students practice and perfect treatment techniques, skills and knowledge previously acquired and utilized in the clinical setting.

**PHYSICAL THERAPY 705**  
**Comprehensive Case Analysis I**  
This is the first course in a two course sequence. This course integrates knowledge obtained throughout the curriculum across the 4 physical therapy practice patterns: Musculoskeletal, Neuromuscular, Cardiovascular/Pulmonary, and Integumentary. Complex patient cases will each have a primary diagnosis in one of the practice patterns and secondary diagnoses in at least one other practice pattern. Students will learn how to identify priorities for patient management using complex cases. Clinical decision making models will be used to guide evaluation and intervention. Students will engage in simulated and clinical experiences to apply their clinical decision making skills.

**PHYSICAL THERAPY 706**  
**Comprehensive Case Analysis II**  
This is the second course in a two course sequence. Cases will be presented that integrate complex clinical presentations across the 4 physical therapy practice patterns: Musculoskeletal, Neuromuscular, Cardiovascular/Pulmonary, and Integumentary. Complex patient cases will each have a multiple medical diagnoses. Students will learn how to identify priorities for patient management while incorporating practice management issues related to life span development, cultural competence, ethics, varied practice setting, and reimbursement. Clinical decision making models will be used to guide evaluation and intervention.

**PHYSICAL THERAPY 710**  
**Capstone Project II (1)**  
In this second course in this three course sequence, students continue to work in collaboration with faculty to complete a capstone project to meet program requirements for graduation. Students will continue to develop or revise a contract to reflect the agreed upon (and evolving) scope of the project within the categories of clinical practice, teaching, scholarship or administration. In this phase of the capstone project students will engage in data collection and/or implementation of defined activity, data analysis and assessment of intended research aims and/or outcomes. Students will complete a summary of their methods and results.

**PHYSICAL THERAPY 711**  
**Capstone Project III (1)**  
In this final course in this three course sequence, students complete their capstone project in collaboration with faculty. Students will continue to develop or revise a contract to reflect the agreed upon (and evolving) scope of the project that is within the categories of clinical practice, teaching, scholarship or administration. In this final phase of the capstone project students will complete their capstone paper, as well as prepare and deliver a presentation of their capstone project in the format expected at a professional peer reviewed meeting.

**PHYSICAL THERAPY 721**  
**Differential Diagnosis (2)**  
With most states allowing clients to directly access physical therapy (PT) without a physician referral, therapists must be able to identify signs and symptoms of disease that can mimic neuromuscular or musculoskeletal dysfunction. Given a clinical environment in which therapists are frequently expected to
assume the role of autonomous practitioner, this course seeks to aid integration of didactic knowledge, clinical problem solving, and the intuitive process into a scheme useful in the formation of a PT clinical diagnosis and intervention program. This course focuses on the differential diagnostic process within physical therapy and screening for the presence of medical disease or other pathologies whose treatment is beyond the scope of physical therapist practice. Emphasis is placed on the use of problem-solving and clinical decision-making for the process of determining when it is most appropriate to: 1) implement physical therapy care, 2) consult with other healthcare providers regarding patient care while implementing PT, or 3) refer the patient to another healthcare provider.

PHYSICAL THERAPY 730
PT Practice Issues: Advocacy, Professional Association (1)
This course explores how DPT students can apply the Core Values of Social Responsibility and Advocacy to clinical practice across the levels of the individual (professional practice), community and profession (practice management). Within the context of contemporary political, legislative and industry practices students will develop strategies to advocate for their patients to have access to the most appropriate physical therapy care as well as advocate for the profession so that we are positioned to provide this care.

PHYSICAL THERAPY 736
Business and Leadership in Physical Therapy Practice (3)
Introduction to the organization and management of health care providers and programs with emphasis on physical therapy. Examination of the internal and external environmental forces which drive the delivery of health care today.

PHYSICAL THERAPY 741
Comprehensive Clinical Decision Making in Physical Therapy (4)
With an increasing number of states allowing clients to directly access Physical Therapy (PT) without a physician referral, therapists must be able to identify signs and symptoms of disease that can mimic neuromuscular or musculoskeletal dysfunction. Given a clinical environment in which therapists are more frequently expected to assume the role of independent practitioner, this course seeks to aide integration of didactic knowledge, clinical problem solving, and the intuitive process into a scheme useful in the formation of a PT clinical diagnosis and intervention program. Furthermore, the course is designed to assist the student in the development of clinical reasoning skills to determine a client’s appropriateness for PT interventions and to identify when a patient should instead, be referred to an appropriate practitioner. Utilizing the PT interview as a foundation, this course will incorporate lectures and discussions of the issues related to Vision 2020, and a review of systems to guide students through an examination scheme that will assist them in making treatment vs. referral decisions. Some topics and systems will be reviewed more thoroughly than others depending on current emphasis in the DPT curriculum.

PHYSICAL THERAPY 774
Physical Therapy Clinical Decision Making in Geriatrics (3)
This course will examine the effects of age on physiological, psychological and social function and how these changes impact health management. The course will consist of didactic and practical components. One practicum will involve experiencing aging issues with participants at a community senior center. The didactic component will provide knowledge needed to manage geriatric issues in physical therapy and the health care delivery system.
PHYSICAL THERAPY 781
Clinical Affiliation III (5)
Classroom instruction related to clinical experiences, self and peer evaluations and educational presentations is followed by a ten-week clinical affiliation in a variety of clinical settings (i.e. rehabilitation, orthopedics, neurology, geriatrics, acute care, pediatrics, etc.). This affiliation incorporates advanced coursework and clinical skills. Students practice and perfect therapeutic interventions, skills and knowledge previously acquired and utilized in the clinical setting. Students are expected to have their own caseload, to assist with the supervision of physical therapist assistants and aides and to develop comprehensive patient care plans.

PHYSICAL THERAPY 782
Clinical Affiliation IV (5)
Classroom instruction related to the clinical experiences, self and peer evaluations, and educational presentations is followed by a ten-week clinical affiliation in a variety of clinical settings (i.e. rehabilitation, orthopedics, neurology, geriatrics, acute care, pediatrics, home health, etc.). This affiliation incorporates advanced coursework and clinical skills. Students practice and perfect therapeutic interventions, skills and knowledge previously acquired and utilized in the clinical setting. Students are expected to have their own caseload, to assist with the supervision of physical therapist assistants and aides to develop comprehensive patient care plans and to function as an entry-level physical therapist.
Physician Assistant Studies
DEPARTMENT OF PHYSICIAN ASSISTANT STUDIES
The Department prepares students to become competent physician assistants (PA), a medical professional who works as part of a team with a physician. After graduating from an accredited PA educational program, PAs become nationally certified and state-licensed to practice medicine with the supervision of a physician. All 50 states and the District of Columbia allow PAs to practice and prescribe medications. PAs work in all areas of medicine, ranging from family practice to surgical subspecialties such as neurosurgery, and they perform physical examinations, diagnose and treat illnesses, order and interpret lab tests, perform procedures, assist in surgery, provide patient education and counseling, and make rounds in hospitals and nursing facilities.

MASTER OF SCIENCE IN PHYSICIAN ASSISTANT STUDIES
In this 27-month master’s level program, students spend 15 months in didactic training and 12 months in clinical training. Didactic courses include anatomy, clinical medicine, pathophysiology, physiology, pharmacology and laboratory medicine. Students complete clinical rotations in internal medicine, primary care, pediatrics, women’s health, behavioral medicine, emergency medicine, surgery and electives.

Upon successful completion of the program, students will be awarded the Master of Science in Physician Assistant Studies (MSPAS) degree.

PROGRAM ACCREDITATION
The ARC-PA has granted Accreditation-Provisional status to the Thomas Jefferson University Physician Assistant Program. Accreditation-Provisional is an accreditation status. The status indicates that the plans and resource allocation for the proposed program appear to demonstrate the program’s ability to meet the ARC-PA Standards, if fully implemented as planned. Accreditation-Provisional does not ensure any subsequent accreditation status. It is limited to no more than five years from matriculation of the first class. Contact information for ARC-PA is as follows:

Accreditation-Provisional Status
Accreditation Review Commission on Education for the Physician Assistant, Inc, (ARC-PA)
12000 Findley Road, Suite 150
Johns Creek, GA 30097
(770) 476-1224
(770) 476-1738 (FAX)
http://www.arc-pa.org/

CURRICULUM (MSPAS)
Year 1
PRE-FALL SEMESTER

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<tr>
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<tr>
<td>PAST 500</td>
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<td>PAST 501</td>
<td>Patient Communication</td>
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<tr>
<td>PAST 520</td>
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<td>PAST 523</td>
<td>Evidenced Based Medicine and Population Health</td>
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<td>PAST 522</td>
<td>Legal and Ethical Aspects of Medicine</td>
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**Total Credits:** 9.5
### FALL 1 SEMESTER

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### SPRING 1 SEMESTER

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### SUMMER 1 SEMESTER

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#### Year 2

### FALL 2 SEMESTER

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### SPRING 2 SEMESTER

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### SUMMER 2 SEMESTER

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*Students will complete 8 clinical rotations in the specialties listed below. The order in which these rotations are taken will be dependent upon clinical placement site availability.*
PAST 601 Internal Medicine Clinical Rotation
PAST 610 Emergency Medicine Clinical Rotation
PAST 620 Women’s Health Clinical Rotation
PAST 630 Behavioral Medicine Clinical Rotation
PAST 640 Surgery Clinical Rotation
PAST 650 Primary Care Clinical Rotation
PAST 660 Pediatrics Clinical Rotation
PAST 670 Elective Clinical Rotation

CREDIT SUMMARY
TOTAL FIRST YEAR CREDITS: 52.5
TOTAL SECOND YEAR CREDITS: 43
TOTAL CREDITS NEEDED FOR GRADUATION: 95.5
DEPARTMENT OF PHYSICIAN ASSISTANT STUDIES FACULTY

Michele Zawora, MD
   Department Chair
   Assistant Professor, Family and Community Medicine

Susan Dubendorfer, MPA, PA-C
   Assistant Professor
   Director of Curriculum & Evaluation

Ilaina Moyer, MHS, PA-C
   Instructor

Michael R. Ponsell, MHS, PA-C
   Assistant Professor
   Director of Clinical Education

Part Time Faculty

Richard Schmidt, PhD
Joanna Chan, MD
Christopher Haines, MD
Geoffrey Mills, MD, PhD
Geno Merli, MD
Emily Scopelliti, PharmD, BCPS
Kimberly Carter, PharmD, BCACP
Roshni Patel, PharmD

DEPARTMENT OF PHYSICIAN ASSISTANT STUDIES STAFF

Margaret Grace
Helene Blair (Clinical)

DEPARTMENT OF PHYSICIAN ASSISTANT STUDIES CONTACT INFORMATION

Thomas Jefferson University
Jefferson College of Health Professions
Department of Physician Assistant Studies
130 South 9th Street, Suite 662
Philadelphia, PA 19107
Telephone: 215-503-0106
Fax: 215-503-0315
paprogram@jefferson.edu
MSPAS COURSE DESCRIPTIONS

PAST500 ADVANCED HUMAN ANATOMY
Advanced Human Anatomy is designed to introduce the student to the gross structure of the human cadaver. The material is divided into the following regions: back, hip, gluteal region, leg, thorax, abdomen, pelvis, upper extremity, lower extremity, neck, and the head. The major visceral structures of each region are described in lecture and examined during dissection. The visceral relationships in each region are emphasized. The musculoskeletal system, the peripheral nervous system and their important functional interrelationships are described in lecture and studied via dissection. The course will incorporate core textbook readings, didactic lectures by the faculty of the Department of Anatomy, audiovisual demonstrations, on-line discussions and laboratory dissection of human cadavers that will be performed in small groups.

PAST510 PATIENT COMMUNICATION
This course is designed to instruct students in the basic skills of patient interaction. Students will learn how to perform a complete medical history and provide patient education with a focus on health promotion. This course will include lectures and small group seminars in which students will practice and evaluate their communication skills.

PAST511 PHYSICAL DIAGNOSIS
This course is designed to prepare the Physician Assistant student to perform comprehensive physical examinations, with special sensitivity to gender, age and cultural background. The course will focus primarily on the adult patient, progressing through the examination of each of the body systems in a sequential manner. Lectures will emphasize didactic instruction in the following areas, examination skills, normal findings, normal variants, and abnormal findings. An emphasis will be placed on the understanding of the relationship of major signs and symptoms to their physiologic or pathophysiologic origins. Live demonstration and videos will be utilized to enhance the lectures. The laboratory will allow students to practice their history taking and physical examination skills in small groups facilitated by faculty members. Successful completion of all Pre-Fall course work is required to enroll in this course.

PAST520 INTRODUCTION TO PROFESSIONAL PRACTICE
This is an introductory course examining health care related issues in today’s society. It begins with a review of the history and evolution of the Physician Assistant profession in US medicine and globally. Topics to be discussed are the status, trends and characteristics of the Physician Assistant as health care providers, their education, regulation, practice patterns, external relations and professional organizations. Issues related to the Physician Assistant practice such as billing and coding will also be covered. Through a self-directed group research exercise, students will acquire knowledge of various aspects of the Physician Assistant profession including, but not limited to state regulatory systems, credentialing, and the globalization of the profession.

PAST523 EVIDENCE BASED MEDICINE AND POPULATION HEALTH
This course is designed to provide the students with an introduction to locating, reading and evaluating medical literature and current medical evidence, as well as public health concepts. The first module of the course will consist of lectures in basic public health concepts. The second module of the course will be delivered online and will consist of instruction on basic evidence based practices. Students will be instructed in medical literature searches, evaluation of literature, and how to use the results of their
research. Students will be required to critically appraise current literature, and to construct quality clinical questions surrounding medical cases.

PAST522 LEGAL AND ETHICAL ASPECTS OF MEDICINE
This course is designed to give students an appreciation of medical ethics and their legal implications. Lectures will provide students with a basic understanding of the ethical responsibilities of Physician Assistants as health care practitioners and as individuals. The course will provide insight and foster critical thinking in the practical application of ethical issues that arise in the practice of medicine. The course will encourage the attributes of respect for self and others and a commitment to welfare of the patient. Legal issues such as litigation and contemporary medical legislation will be discussed.

PAST530 CLINICAL MEDICINE I
This is the first of a series of three Clinical Medicine courses. This course will cover all aspects of common medical conditions, including epidemiology, clinical presentation, diagnostic evaluation, management and prognosis. The course content is integrated with content in Physiology and Pathophysiology I, Clinical Skills I, and Pharmacology and Clinical Therapeutics I which will provide a foundation for Clinical Medicine I. The following organ systems will be covered in this semester: genetics, hematology & oncology, infectious disease, otorhinolaryngology, and dermatology. The course will consist of lectures and small group seminars which will foster the development of critical thinking in the evaluation and management of patients. Successful completion of all Pre-Fall course work is required to enroll in this course.

PAST531 CLINICAL MEDICINE II
This is the second of a series of three Clinical Medicine courses. This course will cover all aspects of common medical conditions, including epidemiology, clinical presentation, diagnostic evaluation, management and prognosis. The course content is integrated with content in Physiology and Pathophysiology II, Clinical Skills II, and Pharmacology and Clinical Therapeutics II which will provide a foundation for Clinical Medicine II. The following organ systems will be covered in this semester: cardiology, pulmonology, nephrology, urology, endocrinology, gastroenterology and orthopedics. The course will consist of lectures and small group seminars which will foster the development of critical thinking in the evaluation and management of patients. Successful completion of all Fall 1 course work is required to enroll in this course.

PAST532 CLINICAL MEDICINE III
This is the third of a series of three Clinical Medicine courses. This course will cover all aspects of common medical conditions, including epidemiology, clinical presentation, diagnostic evaluation, management and prognosis. The course content is integrated with content in Physiology and Pathophysiology III, Clinical Skills III, and Pharmacology and Clinical Therapeutics III which will provide a foundation for Clinical Medicine III. The following organ systems will be covered in this semester: neurology, ophthalmology, rheumatology, women’s health and geriatric medicine. The course will consist of lectures and small group seminars which will foster the development of critical thinking in the evaluation and management of patients. Successful completion of all Spring 1 course work is required to enroll in this course.

PAST540 CLINICAL SKILLS I
This course is designed to guide the Physician Assistant student through diagnostic tests and clinical procedures associated with conditions commonly encountered in the medical setting. This course is
closely aligned with Clinical Medicine I, and will cover diagnostic testing and procedures related to genetics, hematology, oncology, infectious disease and dermatology. The class will consist of lectures and labs, as well as participation in the Jefferson Health Mentors Program. Successful completion of all Pre-Fall course work is required to enroll in this course.

**PAST541 CLINICAL SKILLS II**
This course is designed to guide the Physician Assistant student through diagnostic tests and clinical procedures associated with conditions commonly encountered in the medical setting. This course is closely aligned with Clinical Medicine II, and will cover diagnostic testing and procedures related to cardiology, pulmonology, urology, nephrology, endocrinology, gastroenterology and orthopedics. The class will consist of lectures and labs, as well as participation in the Jefferson Health Mentors Program. Successful completion of all Fall 1 course work is required to enroll in this course.

**PAST542 CLINICAL SKILLS III**
This course is designed to guide the Physician Assistant student through diagnostic tests and clinical procedures associated with conditions commonly encountered in the medical setting. This course is closely aligned with Clinical Medicine III and Special Topics in Medicine. The course will cover diagnostic testing and procedures related to neurology, ophthalmology, wound management and surgical procedures, and geriatric assessments. Students will perform breast, pelvic, testicular and rectal examinations on standardized patients. The class will consist of lectures and labs, as well as participation in the Jefferson Health Mentors Program. Successful completion of all Spring 1 course work is required to enroll in this course.

**PAST550 PHARMACOLOGY AND CLINICAL THERAPEUTICS I**
This is the first of three courses in Pharmacology and Clinical Therapeutics. This course will provide an in depth survey on the general principles of pharmacology and the application of these principles to patient care situations. Students will learn the principles of pharmacokinetics, pharmacodynamics, and pharmacogenetics. Instruction on individual drugs or drug classes will include dosage forms, dose-response relationships, mechanism of action, side effects and toxicities, contraindications, and drug interaction. This course will cover medications related to hematology and oncology, infectious disease, otolaryngology, psychiatry and dermatology. Successful completion of all Pre-Fall course work is required to enroll in this course.

**PAST551 PHARMACOLOGY AND CLINICAL THERAPEUTICS II**
This is the second of three courses in Pharmacology and Clinical Therapeutics. This course will provide an in depth survey on the general principles of pharmacology and the application of these principles to patient care situations. Instruction on individual drugs or drug classes will include dosage forms, dose-response relationships, mechanism of action, side effects and toxicities, contraindications, and drug interaction. This course will cover agents used in cardiology, pulmonology, endocrinology, nephrology, urology, and gastroenterology. Successful completion of all Fall 1 course work is required to enroll in this course.

**PAST552 PHARMACOLOGY AND CLINICAL THERAPEUTICS III**
This is the third of three courses in Pharmacology and Clinical Therapeutics. This course will provide an in depth survey on the general principles of pharmacology and the application of these principles to patient care situations. Instruction on individual drugs or drug classes will include dosage forms, dose-response relationships, mechanism of action, side effects and toxicities, contraindications, and drug
interaction. This course will cover agents used in neurology, rheumatology, women’s health, ophthalmology, and nutritional supplements. The course will also cover the effects of medications in the pediatric, pregnant and geriatric populations. Successful completion of all Spring 1 course work is required to enroll in this course.

**PAST560 PHYSIOLOGY AND PATHOPHYSIOLOGY I**
This is the first of three courses in Physiology and Pathophysiology. The course follows an organ systems organization, and is closely integrated with Clinical Medicine I and Physical Diagnosis. The course focuses on normal and abnormal organ function. Lectures will proceed through the organ systems, emphasizing first the normal physiology of the system, followed by the pathophysiology of diseases related to that system. This semester topics to be covered will include cellular physiology and biochemistry, inflammation, immunology, hematology, neurology and dermatology. Successful completion of all Pre-Fall course work is required to enroll in this course.

**PAST561 PHYSIOLOGY AND PATHOPHYSIOLOGY II**
This is the first of three courses in Physiology and Pathophysiology. The course follows an organ systems organization, and is closely integrated with Clinical Medicine II. The course focuses on normal and abnormal organ function. Lectures will proceed through the organ systems, emphasizing first the normal physiology of the system, followed by the pathophysiology of diseases related to that system. This semester topics to be covered will include the cardiology, pulmonology, nephrology, urology, endocrinology and gastroenterology. Successful completion of all Fall 1 course work is required to enroll in this course.

**PAST562 PHYSIOLOGY AND PATHOPHYSIOLOGY III**
This is the first of three courses in Physiology and Pathophysiology. The course follows an organ systems organization, and is closely integrated with Clinical Medicine III. The course focuses on normal and abnormal organ function. Lectures will proceed through the organ systems, emphasizing first the normal physiology of the system, followed by the pathophysiology of diseases related to that system. This semester topics to be covered will include the neurology, ophthalmology, rheumatology, women’s health and the pathophysiology of aging. Successful completion of all Spring 1 course work is required to enroll in this course.

**PAST570 BEHAVIORAL SCIENCE**
This course introduces counseling and behavioral science theories, skills and tools to the Physician Assistant student to enhance communication skills and enhance understanding of the process of changing health behaviors. This course will focus on cultural issues, recognition and management of domestic violence and abuse, human sexuality, issues related to death and dying, and common psychiatric conditions. Successful completion of all Pre-Fall course work is required to enroll in this course.

**PAST580 MEDICAL NUTRITION**
Medical Nutrition will introduce students to the basics of nutrition science, as it relates to clinical medicine as well as incorporate complementary and alternative medicine related to biologically-based therapies. Topics include nutrition assessment, focusing on dietary history taking and physical exam skills needed for the management of health and disease. Nutritional requirements and age appropriate nutritional issues will be highlighted for children, pregnant and lactating women and older adults. Medical nutrition therapy of cardiovascular disease, diabetes, obesity, hypertension, and surgical
nutrition will be included. Teaching methods will emphasize case presentations and student involvement. Successful completion of all Spring 1 course work is required to enroll in this course.

**PAST585 INTRODUCTION TO HEALTH CARE QUALITY AND SAFETY**
Introduction to health care quality and safety presents the student with the concepts of HealthCare Quality and Safety as horizontally integrated throughout the healthcare system. Provides models for demonstrating the association between quality and safety and healthcare economics, regulation, accreditation and information technology and relates these concepts to population health. Successful completion of all Fall 1 course work is required to enroll in this course.

**PAST590 SPECIAL TOPICS IN MEDICINE**
This course is designed to provide an in depth survey of medical specialties. The course will be presented in four modules: Emergency Medicine, Surgery, Pediatrics, and Advanced Cardiac Life Support (ACLS). Successful completion of all Spring 1 course work is required to enroll in this course.
Professional and Continuing Studies
DEPARTMENT OF PROFESSIONAL AND CONTINUING STUDIES
The Department of Professional and Continuing Studies supports Jefferson’s mission of “Health is all we do” by providing bachelor degree programs and specialty certifications to educate healthcare professionals. The Department offers the Jefferson and greater Philadelphia communities part-time and flexible college-level educational programs in healthcare designed specifically for the professional, academic and personal development of the working adult. The Department offers a Bachelor of Science degree program with three majors [health services management (HSM), health professions management (HPM), and health services management information systems (HSMIS)]. For matriculated students in other Jefferson degree granting programs, a Bachelor of Science degree in health studies (HS) may be an option.

In addition to baccalaureate degree programs, the Department offers pre-baccalaureate certificate programs in medical coding and data quality, medical practice management, and healthcare management information systems.

JEFF-AT-NIGHT
The bachelor’s degrees and pre-baccalaureate certificates are offered through Jeff-at-Night, Jefferson’s designation for the evening, online and weekend programs offered through the Department of Professional and Continuing Studies. Non-matriculating students, i.e., those not pursuing a degree or enrolled in a certificate program, may take Professional and Continuing Studies courses for personal enrichment, for transfer into a specific program, and/or to enhance specific skills. While Professional and Continuing Studies courses and program offerings serve primarily Jefferson employees and students, they are open to everyone in the Greater Philadelphia community.

Classes are offered year-round and students may begin their course of study at any time. In addition, a significant number of courses throughout the year are offered in the online format using the University Course Management System, Blackboard Learn.

PRE-ADMISSION ADVISING
Students who wish to enroll in courses offered through the Department should schedule an appointment with the Director of Undergraduate Programs by calling (215) 503-8414. The Director will answer questions, review high school and college transcripts and help in the selection of an appropriate academic program.

MATRICULATION AND DEGREE COMPLETION
Students who wish to take courses through the Department of Professional and Continuing Studies but who are not currently pursuing a degree are classified as non-matriculated. Non-matriculated students should consult with the Director of Undergraduate Programs to discuss intent to matriculate or continue classes for personal/professional development. Credits earned as non-matriculated students at Jefferson may be applied toward degree requirements up to a maximum of 30 credits. After achieving 30 credits, students wishing to continue courses toward a degree/certificate must formally apply to the desired program. If a student is taking beyond 30 credits as a non-matriculating student, the student must meet with the Director of Undergraduate Programs to discuss their educational goals and potential plans for matriculation. It is recommended that non-matriculated students apply for admission when they have successfully earned 15 credits at Jefferson. The Department’s degree and certificate programs are designed for adult students who work full-time; therefore, matriculation does not mean that
students must register continuously from semester to semester. Students may work at their own pace to complete their degrees; however, students are encouraged to meet with the Director of Undergraduate Programs to design the most timely path to degree completion.

CREDIT BY EXAMINATION
Challenge examinations are available for selected courses. A challenge examination is equivalent to a comprehensive final examination in a course required by a degree-granting program within the Department of Professional and Continuing Studies. Inquiries regarding challenge examinations should be made to the Director of Undergraduate Programs. A grade of B or better must be obtained on all challenge examinations and a challenge examination may only be taken one time. Please refer to the Tuition and Fees section of this catalog for fees associated with Challenge Examinations.

In addition to the College’s challenge examinations, students may earn college academic credit by successful completion of standardized testing available through the College Level Examination Program (CLEP) of the College Board and the ACT/PEP Program. Additional information on the CLEP exam can be found at https://clep.collegeboard.org/.

COURSE DROP/ADD AND WITHDRAWALS COLLEGE AND DEPT CALENDAR COMMENT
For changes in schedule, including course add/drop and course withdrawal, please refer to the Registration Policies and Procedures section of this catalog. Students should make themselves aware of the deadline dates for adding/dropping courses without penalty and for withdrawing from classes. Please refer to the official academic calendar for each academic term. Students who are enrolled in accelerated courses should consult with the Director of Undergraduate Programs to understand schedule change deadlines in accelerated courses.

Students who are Jefferson employees who use their tuition assistance benefit to take courses through Jeff-at-Night are responsible for payment of the full tuition if they withdraw from the course after the official drop/add deadline. Students should consult with Human Resources to determine impact of schedule changes on their tuition benefit.

ALPHA SIGMA LAMBDA HONOR SOCIETY
Founded in 1945 at Northwestern University, Alpha Sigma Lambda is a national honor society devoted to recognition and encouragement of adult students’ academic achievement while they fulfill their responsibilities of family, work and community service. Membership is restricted to matriculated students in the bachelor and associate degree programs who have completed a minimum of 30 credit hours, who have achieved a grade point average of 3.20 or higher, and who rank in the highest ten percent of all eligible students. Induction into Alpha Sigma Lambda takes place annually at Class Night ceremonies prior to spring commencement.

ACADEMIC PROBATION AND SUSPENSION
To remain in good academic standing and to be eligible for degree/certificate completion, students must earn a minimum of a C in all required courses and maintain a minimum cumulative grade point average of 2.0. The Department of Professional and Continuing Studies also adheres to the Academic Probation and Dismissal standards of the Jefferson College of Health Professions. Please refer to the JCHP Student Handbook for academic progression standards.
The Department of Professional and Continuing Studies offers a Bachelor of Science degree program with three majors designed specifically for working adults: Health Services Management (HSM), Health Services Management Information systems (HSMIS) and Health Professions Management (HPM).

These majors prepare individuals for entry-level management positions in a wide variety of healthcare settings – hospitals, nursing homes, insurance companies, health maintenance organizations, clinics, ambulatory care centers, welfare departments, rehabilitation centers and public health agencies. Managers within these organizations plan, organize, coordinate and supervise the delivery of healthcare services, including information systems. Healthcare managers include generalists who administer, manage, or help to manage entire facilities or systems, and specialists who manage clinical departments or services specific to the healthcare industry. Whether generalist or specialist, healthcare managers deal with finances, budgets, personnel, computer systems, laws and legal requirements, program planning and evaluation and organizational behavior, including politics and conflict. While the HSM and HSMIS majors prepare highly qualified generalists and information systems specialists who can serve in a wide variety of healthcare settings, the HPM aims to prepare working clinicians for management and leadership positions within their health professions.

Students majoring in health services management and health services management information systems must complete at least 15 college credits prior to matriculation. Students may transfer up to a total of 60 credits into the program (including those awarded for previous clinical training). Students majoring in health professions management, a curriculum designed for licensed and credentialed healthcare professionals who have not completed a bachelor’s degree, may receive up to 33-39 credits for their previous clinical training.

Admissions Requirements:
For admission into one of the Bachelor of Science degree programs, the student must:
- Complete a pre-application advising session with the Director of Undergraduate Programs.
- Complete a minimum of 15 (maximum of 60) transferrable college credits (with a grade of C or higher). A competitive applicant will have a minimum GPA of 3.0.
- Submit official transcripts for all previous college level courses taken.
- Complete the online application process through the Office of Admissions.

Progression through the Bachelor of Science degree programs:
- Students entering the program with fewer than 60 credits are encouraged to complete at least nine (9) of the required 13 General Education courses before proceeding on to Foundation courses.
- Students should complete all General Education courses before proceeding on to major courses.
- Foundation courses generally serve as prerequisites for Major requirements and should be completed before courses required for the major.
- MGMT 410: Leadership and Strategy, is taken at the end of the curriculum and in conjunction with the internship. (MGMT 411)
• The last 30 credits of a Bachelor of Science degree program must be taken at Thomas Jefferson University.
• To graduate with majors in Health Services Management, Health Services Management Information Systems, and Health Professions Management, students must achieve a minimum cumulative GPA of 2.0 and earn a minimum grade of C in all courses.

**Health Services Management (HSM) (123 credits)**

**General Education Requirements (36-39 credits)**

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<td>Health/Wellness</td>
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<td>Social Science</td>
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<tr>
<td>Computer Applications (CMST 101)</td>
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* College algebra or higher (Students demonstrating college-level algebra proficiency may take pre-calculus or calculus to satisfy both the General Education and Foundation mathematics requirements; they may take a free elective in its place)

**Please consult with Director of Undergraduate Advising to determine your options for completing this requirement.**

**Foundation Requirements (30 credits)**

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 101 Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 102 Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 101 Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>HCA 300 Health Services Delivery and Organization</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>HUMN 315</td>
<td>Methods of Effective Thinking</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Precalculus</td>
</tr>
<tr>
<td>MATH 301</td>
<td>Statistics</td>
</tr>
<tr>
<td>MGMT 101</td>
<td>Principles of Management and Organizational Behavior</td>
</tr>
</tbody>
</table>

**Major Requirements (39 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON/HCA 401</td>
<td>Healthcare Policy and Economics</td>
<td>3</td>
</tr>
<tr>
<td>HCA 303</td>
<td>Business and Healthcare Law</td>
<td>3</td>
</tr>
<tr>
<td>HCA 350</td>
<td>Principles of Public Health &amp; Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HCA 351</td>
<td>Strategic Planning &amp; Marketing for HSOs</td>
<td>3</td>
</tr>
<tr>
<td>HCA 412</td>
<td>Compliance, Quality &amp; Outcomes Analysis in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 310</td>
<td>Management Information Systems in Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 420</td>
<td>Informatics Analysis and Utilization in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 102</td>
<td>Human Resources Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 304</td>
<td>Management &amp; Organizational Theory in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 407</td>
<td>Financial Management of HSOs</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 408</td>
<td>Program Planning &amp; Evaluation in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 410</td>
<td>Leadership and Strategy: Advanced Seminar</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 301</td>
<td>Healthcare Ethics</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 411</td>
<td>Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives**

^For elective suggestions, please consult with the Director of Undergraduate Programs.

**Health Services Management Information Systems (HSM-IS) (123 credits)**

**General Education Requirements (36-39 credits)**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition</td>
<td>6</td>
</tr>
<tr>
<td>Art</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended:

- ART 101 Art Appreciation or
- HUMN 111 Philadelphia and the Arts

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics (College algebra or higher)*</td>
<td>3</td>
</tr>
<tr>
<td>Natural Science</td>
<td>3</td>
</tr>
</tbody>
</table>

From one of the following disciplines: biology, chemistry, physics

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health/Wellness</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended:

- HLTH 101 Personal Health and Wellness
- or
- HLTH 302 Mindfulness-Based Stress Reduction

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Science</td>
<td>12</td>
</tr>
</tbody>
</table>

From four of the following disciplines: anthropology, communications, political science, psychology, sociology.

Recommended:

- POSC 101 Government of the United States
- PSYC 101 Introduction to Psychology
- SOC 101 Introduction to Sociology
ANTH 101 Cultural Anthropology
COMM 101 Interpersonal Communications
Computer Applications or demonstration of computer competency** 3

* College algebra or higher (Students demonstrating college-level algebra proficiency may take pre-calculus or calculus to satisfy both the General Education and Foundation mathematics requirements; they may take a free elective in its place)

** Please consult with Director of Undergraduate Advising to determine your options for completing this requirement.

**Foundation Requirements (30 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 101</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 102</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 101</td>
<td>Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>HCA 300</td>
<td>Health Services Delivery and Organization</td>
<td>3</td>
</tr>
<tr>
<td>HUMN 315</td>
<td>Methods of Effective Thinking</td>
<td>3</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Precalculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 301</td>
<td>Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 101</td>
<td>Principles of Management and Organizational Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

**Major Requirements (39 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMST 212</td>
<td>Database Management</td>
<td>3</td>
</tr>
<tr>
<td>HCA 303</td>
<td>Business and Healthcare Law</td>
<td>3</td>
</tr>
<tr>
<td>HCA 350</td>
<td>Principles of Public Health &amp; Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>HCA 351</td>
<td>Strategic Planning &amp; Marketing for HSOs</td>
<td>3</td>
</tr>
<tr>
<td>HCA 412</td>
<td>Compliance, Quality &amp; Outcomes Analysis in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 310</td>
<td>Management Information Systems in Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 311</td>
<td>Informatics Resources &amp; Technology for Health Services</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 401</td>
<td>Network Management</td>
<td>3</td>
</tr>
<tr>
<td>HMIS 402</td>
<td>Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 410</td>
<td>Leadership and Strategy: Advanced Seminar</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 304</td>
<td>Management &amp; Organizational Theory in HSOs</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 301</td>
<td>Healthcare Ethics</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>HMIS 411</td>
<td>Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

^For elective suggestions, please consult with the Director of Undergraduate Programs.

**Health Professions Management (HPM) (123 credits)**

The major in health professions management (HPM) is designed for licensed and credentialed healthcare professionals who have not completed a bachelor’s degree. After review of their credentials by the Director of Undergraduate Programs, these healthcare professionals may receive up to 33-39 credits for their previous clinical training. Licensed or credentialed individuals from a variety of
healthcare fields may be eligible for these professional credits. Samples of related healthcare fields include:

Cardiovascular Technology  
Dental Assistant  
Dental Hygiene  
Diagnostic Medical Sonography  
Electroneurodiagnostic Technology  
EMT-Paramedic  
Medical Laboratory Technology  
Nuclear Medicine Technology  
Physical Therapy Assistant  
Radiation Therapy  
Radiologic Technologies (MRI, CT)  
Respiratory Therapy  
Surgical Technology  
Veterinary Technology

**General Education Requirements (30-33 credits)**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition</td>
<td>6</td>
</tr>
<tr>
<td>Art</td>
<td>3</td>
</tr>
<tr>
<td>Recommended:</td>
<td></td>
</tr>
<tr>
<td>ART 101 Art Appreciation or HUMN 111 Philadelphia and the Arts</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics (College algebra or higher)</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>12</td>
</tr>
<tr>
<td>From four of the following disciplines: anthropology, communications, political science, psychology, sociology.</td>
<td></td>
</tr>
<tr>
<td>Recommended:</td>
<td></td>
</tr>
<tr>
<td>POSC 101 Government of the United States</td>
<td></td>
</tr>
<tr>
<td>PSYC 101 Introduction to Psychology</td>
<td></td>
</tr>
<tr>
<td>SOC 101 Introduction to Sociology</td>
<td></td>
</tr>
<tr>
<td>ANTH 101 Cultural Anthropology</td>
<td></td>
</tr>
<tr>
<td>COMM 101 Interpersonal Communications</td>
<td></td>
</tr>
<tr>
<td>Computer Applications or demonstration of computer competency**</td>
<td>3</td>
</tr>
</tbody>
</table>

** Please consult with Director of Undergraduate Advising to determine your options for completing this requirement.

**Foundation Requirements (27 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 101 Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 102 Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 201 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 101 Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>HCA 300 Health Services Delivery and Organization</td>
<td>3</td>
</tr>
<tr>
<td>HUMN 315 Methods of Effective Thinking</td>
<td>3</td>
</tr>
<tr>
<td>MATH 301 Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 101 Principles of Management and Organizational Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

**Major Requirements (30 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCA 303 Business and Healthcare Law</td>
<td>3</td>
</tr>
<tr>
<td>HCA 350 Principles of Public Health &amp; Epidemiology</td>
<td>3</td>
</tr>
</tbody>
</table>
HCA 351  Strategic Planning & Marketing for HSOs  3
HCA 412  Compliance, Quality & Outcomes Analysis in HSOs  3
MGMT 102  Human Resources Management  3
MGMT 304  Management & Organizational Theory in HSOs  3
MGMT 407  Financial Management of HSOs  3
MGMT 408  Program Planning & Evaluation in HSOs  3
MGMT 410  Leadership and Strategy: Advanced Seminar  3
PHIL 301  Healthcare Ethics  3
Health Professions Credits  33-39
MGMT 411  Internship  3

**Bachelor of Science in Health Studies**

The Bachelor of Science in Health Studies degree is intended for Jefferson students who may be unable to complete the academic program in which they were originally enrolled. Students can begin the health studies curriculum after completing three semesters or at least 44 credits of their previously enrolled program in a Jefferson College. Students interested in this degree option should coordinate the transfer between degrees with the Program Director/Department Chair of the program they wish to leave and the Director of Undergraduate Programs in the Department of Professional and Continuing Studies.

The 120 credits required for the Bachelor of Science in Health Studies comprises four core courses (12 credits), three elective courses (9 credits) in health services or a related field, a minimum of 44 credits earned in one of the Colleges’ health professions programs and 55 credits from prerequisite courses transferred into the health professions program from other institutions. If applicable, students may transfer as many as nine (9) credits from previous institutions to satisfy core or elective requirements. These nine transferred credits, however, may not be ones that were used to meet entrance requirements of the health professions program.

**Curriculum**

**Core courses (12 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDSC 302</td>
<td>Understanding Research Principles and the Scientific Method or departmental equivalent</td>
<td>3</td>
</tr>
<tr>
<td>HCA 300</td>
<td>Healthcare Delivery and Organization</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 101</td>
<td>Principles of Management and Organizational Behavior or</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 304</td>
<td>Management &amp; Organizational Theory in Health Services Organizations</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 301*</td>
<td>Healthcare Ethics</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

**Elective courses related to health care or healthcare services**

The following are recommended:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMST 201</td>
<td>Technology Applications in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>GNST 120^</td>
<td>Comprehensive Medical Terminology</td>
<td>4</td>
</tr>
<tr>
<td>HCA 302</td>
<td>Healthcare Classification Systems</td>
<td>3</td>
</tr>
<tr>
<td>HCA 303</td>
<td>Business and Healthcare Law</td>
<td>3</td>
</tr>
<tr>
<td>HCA 350</td>
<td>Principles of Public Health and Epidemiology*</td>
<td>3</td>
</tr>
<tr>
<td>HCA 351</td>
<td>Strategic Planning and Marketing for Health Services Organizations*</td>
<td>3</td>
</tr>
<tr>
<td>HCA/ECON 401</td>
<td>Healthcare Policy and Economics*</td>
<td>3</td>
</tr>
<tr>
<td>HCA 410</td>
<td>Medical Practice Management*</td>
<td>3</td>
</tr>
</tbody>
</table>
Health Professions Credits  44

Prerequisite courses transferred into a JCN, JCP or JCHP program from other institutions  55

ASSOCIATE DEGREE PROGRAMS
As of July 1, 2015, no new applications to the associate degree programs are being accepted. Current students pursuing an associate of science or associate in arts degree who do not have an academic plan developed to ensure graduation by May, 2016 should make an appointment with the Director of Undergraduate Programs for advising.

- Liberal arts (AA)
- Science (generic) (AS)
- Business (AS-B)
- Information systems (AS-IS)
- Medical practice management (AS-MPM)

Depending on the program specialization, 30 credits may be transferred from other accredited institutions. The last 30 credits of the degree program must be earned at Thomas Jefferson University.

Associate in Arts (60 credits)
The Associate in Arts degree is awarded upon satisfactory completion of the following courses:

- ANTH 101  Cultural Anthropology  3
- ART 101  Art Appreciation or  3
- HUMN 111 Philadelphia and the Arts or
- COMM 101  Interpersonal Communications or  3
- COMM 201 Intercultural Communications

- ENGL 101,102  Composition I & II  6
- Foreign Language (Elementary)  6
- HIST 111,112  United States History or  6
- HIST 101,102 World Civilization

- MATH 101  College Algebra  3
- POSC 101  Government of the United States  3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 101</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Computer Studies Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Humanities Elective*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Free Electives^</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

* Humanities include courses in art, English, history, philosophy, religion and certain areas of communications. Please consult with Director of Undergraduate for course suggestions that will be approved for to meet this requirement.

^For elective suggestions, please consult with the Director of Undergraduate Programs.

**Associate in Science-Generic (61 credits)**

The Associate in Science degree is awarded upon satisfactory completion of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 101</td>
<td>Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ART 101</td>
<td>Art Appreciation or</td>
<td>3</td>
</tr>
<tr>
<td>HUMN 111</td>
<td>Philadelphia and the Arts</td>
<td></td>
</tr>
<tr>
<td>BIOL 101, 102</td>
<td>General Biology I &amp; II</td>
<td>8</td>
</tr>
<tr>
<td>CHEM 101,102</td>
<td>General Chemistry I &amp; II</td>
<td>8</td>
</tr>
<tr>
<td>COMM 101</td>
<td>Interpersonal Communications or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 201</td>
<td>Intercultural Communications</td>
<td></td>
</tr>
<tr>
<td>ENGL 101, 102</td>
<td>Composition I &amp; II</td>
<td>6</td>
</tr>
<tr>
<td>HIST 111,112</td>
<td>United States History or</td>
<td>6</td>
</tr>
<tr>
<td>HIST 101, 102</td>
<td>World Civilization I &amp; II</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>POSC 101</td>
<td>Government of the United States</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 101</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Computer Studies Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Humanities Elective*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Free Electives^</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

* Humanities include courses in art, English, history, philosophy, religion, and certain areas of communications. Please consult with Director of Undergraduate for course suggestions that will be approved for to meet this requirement.

^For elective suggestions, please consult with the Director of Undergraduate Programs.

**Associate in Science in Business (63 Credits)**

**General Education Courses (33 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 101</td>
<td>Art Appreciation or</td>
<td>3</td>
</tr>
<tr>
<td>HUMN 111</td>
<td>Philadelphia and the Arts</td>
<td></td>
</tr>
<tr>
<td>BIOL 200</td>
<td>Body Form and Function</td>
<td>3</td>
</tr>
<tr>
<td>COMM 101</td>
<td>Interpersonal Communications or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 201</td>
<td>Intercultural Communications</td>
<td></td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Composition I</td>
<td>3</td>
</tr>
</tbody>
</table>
ENGL 102  Composition II or
        ENGL 103 Business and Technical Writing  3
HLTH 101  Personal Health and Wellness or
        HLTH 302 Mindfulness Based Stress Reduction  3
HIST 111  United States History to 1865  3
HIST 112  United States History Since 1865  3
MATH 101  College Algebra or
        MATH 102 Precalculus  3
POSC 101  Government of the United States  3
PSYC 101  Introduction to Psychology or
        SOC 101 Introduction to Sociology  3

**Major Related Courses (30 credits)**

ACCT 101  Financial Accounting  3
ACCT 102  Managerial Accounting  3
CMST 201  Technology Applications in Health Care  3
ECON 201  Principles of Macroeconomics  3
ECON 202  Principles of Microeconomics  3
FIN 101  Principles of Finance  3
HCA 303  Business and Healthcare Law  3
MGMT 101  Principles of Management and Organizational Behavior  3
MGMT 102  Human Resources Management  3
MGMT 201  Principles of Marketing  3

**Associate in Science in Information Systems (63 Credits)**

**General Education Courses (33 credits)**

ART 101  Art Appreciation or
        HUMN 111 Philadelphia and the Arts  3
BIOL 200  Body Form and Function  3
COMM 101  Interpersonal Communications or
        COMM 201 Intercultural Communications  3
ENGL 101  Composition I  3
ENGL 102  Composition II or
        ENGL 103 Business and Technical Writing  3
HIST 111  United States History to 1865  3
HIST 112  United States History Since 1865  3
HLTH 101  Personal Health and Wellness or
        HLTH 302 Mindfulness Based Stress Reduction  3
MATH 101  College Algebra or
        MATH 102 Precalculus  3
POSC 101  Government of the United States  3
PSYC 101  Introduction to Psychology or
        SOC 101 Introduction to Sociology  3

**Major Related Courses (30 credits)**

CMST 101  Essentials of Computing (or advised elective)  3
CMST 201  Technology Applications in Health Care  3
CMST 212  Database Management  3  
HCA 300  Health Services Delivery and Organization  3  
HMIS 310  Management Information Systems in Health Care  3  
HMIS 311  Informatics Resources and Technology for Health Services  3  
HMIS 401  Network Management  3  
HMIS 402  Systems Design  3  
MATH 301  Statistics  3  
MGMT 101  Principles of Management and Organizational Behavior  3  

**Associate in Science in Medical Practice Management (64 Credits)**

**General Education (33 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ART 101</td>
<td>Art Appreciation or HUMN 111 Philadelphia and the Arts</td>
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<tr>
<td>BIOL 200</td>
<td>Body Form and Function</td>
<td>3</td>
</tr>
<tr>
<td>COMM 101</td>
<td>Interpersonal Communications or COMM 201 Intercultural Communications</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 101</td>
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<td>3</td>
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<tr>
<td>ENGL 102</td>
<td>Composition II or ENGL 103 Business and Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>HIST 111</td>
<td>United States History to 1865</td>
<td>3</td>
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<tr>
<td>HIST 112</td>
<td>United States History Since 1865</td>
<td>3</td>
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<tr>
<td>HLTH 101</td>
<td>Personal Health and Wellness or HLTH 302 Mindfulness Based Stress Reduction</td>
<td>3</td>
</tr>
<tr>
<td>MATH 101</td>
<td>College Algebra or MATH 102 PreCalculus</td>
<td>3</td>
</tr>
<tr>
<td>POSC 101</td>
<td>Government of the United States</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychology or SOC 101 Introduction to Sociology</td>
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**Major Related Courses (31 credits)**

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</tr>
<tr>
<td>CMST 201</td>
<td>Technology Applications in Health Care</td>
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</tr>
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<td>GNST 120</td>
<td>Comprehensive Medical Terminology</td>
<td>4</td>
</tr>
<tr>
<td>HCA 300</td>
<td>Health Services Delivery and Organization</td>
<td>3</td>
</tr>
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<td>HCA 302</td>
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</tr>
<tr>
<td>MGMT102</td>
<td>Human Resources Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**PRE-BACCALAUREATE CERTIFICATE PROGRAMS**

- Medical Coding and Data Quality*  
- Medical Practice Management  
- Healthcare Management Information Systems
The Department of Professional and Continuing Studies offers pre-baccalaureate certificate programs in Medical Coding and Data Quality, Medical Practice Management, and Healthcare Management Information Systems. These certificate programs are part of Thomas Jefferson University’s efforts to provide employees and others in the community with learning opportunities for career enhancement and upward career mobility. With academic advising and proper planning, students may apply credits earned through a certificate toward completion of a baccalaureate degree at Jefferson or another college or university.

Admission Requirements

- Complete a pre-application advising session with the Director of Undergraduate Programs
- Provide evidence of a minimum of a high school diploma or General Education Diploma (GED)
- Demonstrate ability to perform college work: successful completion (grade of C or higher) of college-level work at Thomas Jefferson University or another accredited institution of higher education
  - For Medical Coding and Data Quality: evidence of satisfactory completion of at least 6 credits is required
  - For Medical Practice Management and Healthcare Management Information Systems: evidence of satisfactory completion of at least one 3-credit course is required
- Demonstrate satisfactory computer skills (competency equivalent to introductory college-level computer course). Note: Students who do not meet minimum computer proficiency will be required to complete CMST 101: Essentials of Computing.

^ Waived for students with AA/AS degree or higher.

Progression through the Certificate Programs:

- Once enrolled in a certificate program, all credits required for the certificate must be taken at Thomas Jefferson University.
- To earn a certificate in Medical Coding and Data Quality, Medical Practice Management, and Healthcare Management Information Systems, students must achieve a minimum cumulative GPA of 2.0 and earn a minimum grade of C in all courses.

Medical Coding and Data Quality (18 credits)*

* The Medical Coding and Data Quality certificate is in the process of being revised to reflect the implementation of ICD-10 and to adhere to accreditation standards. The updated curriculum is anticipated to be ready for the Spring 2016 semester. Please contact the Department of Professional and Continuing Studies for additional information.

Medical Coding is an essential function in the management of information that permits hospitals and other health care facilities to receive timely and accurate payment for services. Its importance extends far beyond the functions of billing and reimbursement. Accurate and precise medical information, acquired through the coding process, is used in patient care management, quality and utilization reviews, and research and planning in every aspect of the healthcare industry: primary medical research, public health, or marketing of services and facilities. Today’s coding specialists work in acute care hospitals, insurance companies, health maintenance organizations, pharmaceutical companies, consulting firms, ambulatory surgical centers, physicians’ offices and clinics, and home health agencies.
The Certificate in Medical Coding and Data Quality requires satisfactory completion of eight (8) college-level courses (18 credits). Successful completion of the program prepares graduates for professional certification examinations in CPT-4/HCPCS (Current Procedural Terminology-4/Health Care Finance Administration Common Procedural Coding System) and/or ICD-10-CM (International Classification of Disease, 10th Revision, Clinical Modification). Credits earned through the Certificate may be transferable to the Bachelor of Science program in health information administration or management.

Curriculum

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<td>CODP 201</td>
<td>Human Disease and Treatment</td>
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<tr>
<td>CODP 202</td>
<td>ICD-10-CM Coding</td>
<td>2</td>
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<tr>
<td>CODP 203</td>
<td>CPT Coding Concepts</td>
<td>2</td>
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<tr>
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<td>Application of CPT Coding Concepts</td>
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<tr>
<td>CODP 205</td>
<td>ICD 10—PCS Coding</td>
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<tr>
<td>CODP 206</td>
<td>ICD 10 Principles/Application</td>
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Medical Practice Management (37 credits)

The certificate in Medical Practice Management provides a comprehensive and intensive preparation for the management and administration of day-to-day operations of a medical or other health professions practice. Courses offered for this certificate are directly transferable to the Bachelor of Science degree in health services management.

Curriculum

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Healthcare Management Information Systems (21 credits)
The certificate program in Healthcare Information Systems aims to provide competency in key areas of healthcare information. Credits earned in the certificate may be transferred to the baccalaureate programs in information systems offered through Jefferson. The certificate also provides general competencies for students who already hold a degree in an unrelated area.

Curriculum
[Prerequisite: CMST 101: Essentials of Computing or equivalent]
HCA 300  Health Services Delivery and Organization  3
CMST 201  Technology Applications for Healthcare  3
HMIS 310  Management Information Systems in Health Care  3
CMST 212  Database Management  3
HMIS 311  Informatics Resources and Technology for Health Services  3
HMIS 401  Network Management  3
HMIS 402  Systems Design  3

DEPARTMENT OF PROFESSIONAL AND CONTINUING STUDIES
ADMINISTRATION AND STAFF
Debra S. Zelnick, OTD, OTR/L
Interim Department Chair
Christine Staropoli, MS, RHIA, CCS
Program Director, Medical Coding and Data Quality
Nicole Cobb-Moore, MA
Program Director, Undergraduate Programs
Edwin Barrita
Administrative Assistant

*An active listing of all adjunct faculty is on file in the Office of Professional and Continuing Studies.

CONTACT INFO:
Department of Professional and Continuing Studies
Jefferson College of Health Professions
Thomas Jefferson University
130 S. 9th Street
Edison Building, Suite 530
Philadelphia, PA 19107
(215) 503-8414
E-mail: DPCS@jefferson.edu
PROFESSIONAL AND CONTINUING STUDIES COURSE DESCRIPTIONS
Courses are described in alphabetical order within course level (undergraduate, graduate). Please note: “GNST” courses are listed under “Professional and Continuing Studies” in the alphabetized list.

Undergraduate Courses
ACCT 101
Financial Accounting (3)
Discusses classification of accounts and interrelationships as they affect external reports of the business entity. Emphasizes development and application of generally accepted accounting principles in the preparation of financial statements.
Prerequisite: Mathematics 101 or higher

ACCT 102
Managerial Accounting (3)
Accounting and information decision-making. Emphasizes internal reports and plans such as income statements, capital budgets, cost-volume-profit relationships, pricing of products and services and variance analysis. Discusses potential ethical concerns in making business decisions.
Prerequisite: Accounting 101

ANTH 101
Cultural Anthropology (3)
Explores fundamentals of culture, regardless of where and when people have lived. Discusses contemporary issues such as health and illness, resource distribution and comparative family structures.

ART 101
Art Appreciation (3)
Investigates painting, sculpture, architecture and graphics. Examines techniques and subject matter. Includes field trips.

BIO 101
General Biology I (3)
Introduces principles of biology, including the function, evolution and morphology of animals. Integrates lecture with laboratory sessions.

BIO 101L
General Biology I Laboratory (1)
Laboratory session to accompany BIOLOGY 101

BIO 102
General Biology II (3)
Continues the investigation of human biological principles and structures begun in Biology 101. Integrates lecture and laboratory sessions throughout the course.
Prerequisite: Biology 101

BIO 102L
General Biology II Laboratory (1)
Laboratory session to accompany BIOLOGY 102
BIOLOGY 110
Human Anatomy and Physiology I (3)
Examines the human body with emphasis on structure and function of the skeletal, muscular and nervous systems. Investigates each system at the cellular level. Recommended: Biology 101, 102

BIOLOGY 110L
Human Anatomy and Physiology I Laboratory (1)
Laboratory session to accompany BIOLOGY 110.

BIOLOGY 111
Human Anatomy and Physiology II (3)
Examines structure and function of the endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems. Emphasizes interrelationships and maintenance of a stable internal environment. Prerequisite: Biology 110.

BIOLOGY 111L
Human Anatomy and Physiology II Laboratory (1)
Laboratory session to accompany BIOLOGY 110

BIOLOGY 200
Body Form and Function (3)
A basic but comprehensive introduction to the anatomy and physiology of the human body intended for non-medical and non-health professional personnel. Examines structure and function of skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems.

BIOLOGY 315
Microbiology (3)
Examines microorganisms including bacteria, viruses, fungi and parasites. Emphasizes microorganisms responsible for human disease. Presents topics in immunology and therapeutic agents used to combat infectious diseases.

BIOLOGY 316
Microbiology Laboratory (1)
Examines topics in conjunction with those discussed in lecture. Includes use of the microscope and other equipment, observation of laboratory safety rules, ability to isolate organisms and ability to perform Gram stains. Presents microscopic and macroscopic specimens for identification, description or discussion.

BIOLOGY 402
Human Pathology (3)
Investigates the Pathophysiology of human diseases. Emphasizes common disease processes that affect patients and the diagnostic test/procedures that are utilized in the clinical setting.
CHEMISTRY 100
Introduction to Chemistry (3)
Introduces important concepts and reviews basics of chemistry, including fundamental theories of inorganic chemistry and forms of chemical calculations and reactions. Prepares students for Chemistry 101/102.

CHEMISTRY 101
General Chemistry I (3)
Examines theories of inorganic chemistry, such as atomic structure, nuclear processes, chemical bonding, kinetic molecular theory, energy and equilibria, gas laws, liquids and solids, oxidation and reduction, solutions, acids and bases, electrolytes and bioinorganic chemistry.

CHEMISTRY 101L
General Chemistry I Laboratory (1)
Laboratory sessions to accompany Chemistry 101.

CHEMISTRY 102
General Chemistry II (3)
Continuation of Chemistry 101 with emphasis on organic compounds: halogenated hydrocarbons, alcohols, phenols and ethers, aldehydes and ketones, organic acids and derivatives, amines and derivatives, compounds of sulfur and phosphorus, and polymers.
Prerequisite: Chemistry 101

CHEMISTRY 102L
General Chemistry II Laboratory (1)
Laboratory sessions to accompany Chemistry 102.

CHEMISTRY 103
Introduction to Organic Chemistry (3)
Examines structure and reactions of organic compounds in relation to modern chemical theories.
Prerequisite: Chemistry 102

CHEMISTRY 110
General Chemistry (4)
Examines areas of inorganic, organic and biological chemistry to reveal relationships among the three disciplines. Demonstrates chemistry’s importance in normal biochemical function of the cell; normal functions of the body when the chemistry goes wrong; action of drugs on the body; and chemistry’s role in alleviating disease and suffering.

CHEMISTRY 305
Advanced Biochemistry (3)
An accelerated review of biochemical principles. Emphasizes the structure, function and metabolism of biomolecules and the relationship between biochemical processes and biological structure.
Prerequisites: Biology 111, Chemistry 102
CODING
CODP 200
Structure and Function of the Human Body (3)
A basic but comprehensive introduction to the anatomy and physiology of the human body. Examines structure and function of skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems.

CODP 201
Human Disease and Treatment (2)
Most common diseases and disorders of the body systems. Cause, diagnosis, treatment and applicable surgical procedures are explained, as well as their relationship to specific anatomy and physiology.
Prerequisites: GNST 120 Comprehensive Medical Terminology, BIOL 200 Body Form and Function

CODP 202
ICD-10-CM Coding Concepts (2)
Assignment of ICD-10-CM codes from Volumes I, II and III. Coding and sequencing guidelines for both inpatient and outpatient care settings.
Prerequisites: CODP 201 Human Disease and Treatment (can be taken concurrently)

CODP 203
CPT Coding Concepts (2)
Assignment of CPT/HCPCS codes which are utilized in the outpatient hospital and physician office settings. Evaluation and management services, Medicine, Anesthesia and various surgical sub-specialties, including any applicable procedural terminology.
Prerequisites: CODP 201 Human Disease and Treatment (can be taken concurrently)

CODP 204
Application of CPT-4 Coding Concepts (2)
Building on concepts learned in CODP 203 CPT Coding Concepts, learners will advance coding skills by assigning valid procedure codes for a variety of complex case studies and clinical scenarios.
Prerequisite: CODP 203 CPT Coding Concepts

CODP 205
ICD-10-PCS Coding (2)
Learn coding concepts utilized by the ICD-10-PCS coding system, to include definitions of Root Operations, approaches, and Devices and the application of the Body Part Key. Coding exercises and operative reports will be used to demonstrate conventions and guidelines associated with ICD-10-PCS.
Prerequisites: CODP 201 Human Disease and Treatment

CODP 206 (1)
ICD-10-Principles/Application (1)
Builds on ICD-10-CM coding skills learned in previous classes by utilizing redacted patient records and coding scenarios. A review of Present On Admission guidelines, as well as reimbursement concepts prevalent in the healthcare industry, such as, DRGs, APR-DRGs, APCs, etc.
Prerequisite: Completion of all CODP courses in certificate program or by permission of instructor.
COMMUNICATIONS 101
Interpersonal Communications (3)
Presents theory and its application in the area of informal, interpersonal communication. Uses career-related workshop approach to study effective one-to-one and small group communication. Examines self-disclosure, risk, trust and other influences in human interaction.

COMMUNICATIONS 102
Effective Speech Communication (3)
Examines oral communication principles, including verbal and nonverbal language, listening, group dynamics and public speaking

COMMUNICATIONS 201
Intercultural Communications (3)
An experiential approach to developing intercultural awareness. Presents three aspects of intercultural communication: (1) knowledge of culture and cultural differences; (2) attitudes and feelings about those who are culturally different; and (3) skills or new behaviors to improve effective communication when living and/or working with people of other cultures. Uses videos, classroom guests and field trips to ethnic museums, restaurants and festivals, as well as in-class exercises, readings and discussions.

COMMUNICATIONS 301
Rhetoric and Debate (1-3)
Teaches use of logic and rhetoric through exploration and discussion of current political and world issues.

COMPUTER STUDIES 101
Essentials of Computing (3)
Computer laboratory-based class experience designed for individuals with basic knowledge of the computer. Practice in word processing, spreadsheet applications, PowerPoint and Internet searching and utilization. Exercise-driven laboratory sessions enable participants to produce a portfolio demonstrating acceptable mastery of popular computer applications.

COMPUTER STUDIES 103
Computing Essentials (1)
Accelerated version of Essentials of Computing. Computer laboratory-based class experience designed for individuals with basic knowledge of the computer. Practice in word processing, spreadsheet applications, PowerPoint and Internet searching and utilization.

COMPUTER STUDIES 201
Technology Applications for Healthcare (3)
Computer laboratory-based class experience designed for individuals with substantial knowledge of the computer. Case-based approach provides the opportunity to apply knowledge and skills to a wide variety of scenarios in health care delivery, management or analysis. Requires knowledge of common applications such as Microsoft Word, ACCESS, EXCEL, PowerPoint. Prerequisite: Computer Studies 101 or equivalent
COMPUTER STUDIES 212
Database Management (3)
Presents design and application of databases as information tools. Provides practice in generation of reports, forms and other concepts relating to the use of organized information. Emphasizes ACCESS and EXCEL as software examples in the creation of efficient databases.
Prerequisite: Computer Studies 101 or equivalent

COMPUTER STUDIES 381
Advanced Data Analysis (3)
Examines and applies the essential analytical and technical skills needed to conduct data analysis using SYSTAT software, a statistics and interactive graphics program for research in medicine, psychology, and environmental and biological sciences. Assignments result in completion of a small research project using SPSS applications.
Prerequisites: Computer Studies 201, 212 or their equivalent, knowledge/study of statistics or permission of the facilitator

ECONOMICS 201
Principles of Macroeconomics (3)
Examines the operation of the aggregate economic system. Compares capitalistic and socialistic economics and considers the role of government in each. Emphasizes U.S. economy and macroeconomic factors that determine employment, inflation, the gross national product and money supply. Compares Classical, Keynesian and post-Keynesian perspectives.

ECONOMICS 202
Principles of Microeconomics (3)
Examines economic behavior and problems of the individual consumer and the individual business firm. Includes theory of consumer behavior, production costs and price and output determination in pure competition, pure monopoly, monopolistic competition and oligopoly.

ECONOMICS 401/HEALTHCARE ADMINISTRATION 401
Healthcare Policy and Economics (3)
Applies economic analytical techniques to critical issues in health care and health policy (e.g., growth of healthcare expenditures, intended and unintended consequences of Medicare reform). Examines demand side considerations for health and medical care as well as for health insurance. Explores supply side considerations such as managed care and markets for healthcare professionals and hospital services. Identifies socio-cultural factors, demographic changes, legal and governmental regulations, technological advances and their impact on the economics of healthcare delivery.
Prerequisites: Healthcare Administration 300, Economics 202

EDUCATION 111
Parenting Education for Emotional Growth I (3)
Examines physical, social, emotional, cognitive and psychological development in children from infancy through six years of age. Emphasizes emotional/psychological growth from a psychodynamic perspective. Analyzes techniques and strategies for optimizing childhood development through effective parenting.
EDUCATION 112  
**Parenting Education for Emotional Growth II (3)**  
Continuation of Education 111 with focus on children after age six.

EDUCATION 301  
**Methods of Teaching (3)**  
Discusses factors and conditions relevant to effective teaching and learning with special consideration given to the adult learner. Provides practice in the techniques of individual and group teaching, lesson planning and presentation, classroom management, use of teaching aids and evaluation procedures.

EDUCATION 307  
**Concepts and Techniques in Assessment (3)**  
Presents concepts of evaluation/assessment and principles of statistical procedure used in determining successful evaluations. Examines and constructs selected evaluation instruments tailored to specific course objectives. Develops an evaluation philosophy and model for evaluating multiple levels of performance in both didactic and clinical instruction.

EDUCATION 401  
**Technology and Instruction (3)**  
Examines theoretical and practical approaches to integration of technological advances in educational course delivery. Investigates impact of technology on curricular development, including electronic and virtual classroom formats.

EDUCATION 409  
**Curriculum Design and Evaluation (3)**  
Examines principles and practices for developing and evaluating curricula from the programmatic to the course level. Matches curricular requirements to expected end-product learner outcomes. Presents techniques for assuring completeness. Examines essential processes such as syllabus construction and competency-based decision making.

EDUCATION MSED 500  
**Graduate Study Online Orientation (0)**  
Required for all entering learners, this course provides didactic and practical experience in navigating through an online course. Specific attention is directed toward discussion boards, online publications, bibliographic and resource searching and web 2.0 applications of educational experience. Orientation to requirements at the breadth, depth and application levels is included with required example themes.

At the close of this learning experience, participants will be enabled to:  
- Effectively navigate and participate in an online course experience,  
- Provide challenging Discussion Board responses to posted inquiries and exercises,  
- Apply interactive skills in synchronous discussions when established

EDUCATION MSED 501  
**The Adult Learner (3)**  
Theory and foundations of adult education and individual learning. Review of philosophical concepts and their application to the practice of educating adults. Implications of adult development theories for education with specific attention to increasing numbers of adult learners in health care settings.
At the close of this learning experience, participants will be enabled to:

- Interpret and apply the knowledge base for adult education theory and concepts of adult development and adult learning,
- Identify and incorporate implications of adult developmental theories for adult learning in the health care setting,
- Practically merge adult learning theory and practice to promote excellence in patient care,
- Apply theory and practices inherent to the Adult Enablement Halo in the delivery of learning experiences.

EDUCATION MSED 502
Psychology of Learning (3)

At the close of this learning experience, participants will be enabled to:

- Apply principles of effective learning theory based upon learning assessment,
- Determine effective learning strategies after group and individual analyses,
- Construct and implement evaluation exercises appropriate to a learning task

EDUCATION MSED 503
Methods in Health Care Education (3)
Examination of three categories of practice: knowledge, synthesis, and performance. Positive aspects of lecture, demonstration, practical inquiry, feedback monitoring and strategy maximization. Case based approach to health care tasks inherent to several care venues. Analysis of the breadth, depth and application levels of teaching.

At the close of this learning experience, participants will be enabled to:

- Integrate performance tasks with learning activities,
- Identify learning needs and tailor appropriate strategies to maximize learning,
- Develop and implement a case analysis technique suited to effective learning and demonstration of clinical competencies

EDUCATION MSED 504
Instructional Technology (3)
Use of technological tools for instruction; for teaching, training, and clinical/didactic learning; for presentation and development; and for administration and management. Incorporates technical aspects of online delivery procedures and effective planning for the use of instructional technology in a health care environment. Survey of simulation modalities and costing methods in educational laboratory development.

At the close of this learning experience, participants will be enabled to:

- Recognize value and contribution of selected technological tools in the delivery of instruction,
- Adapt current technology to specific needs in practical and didactic learning settings,
- Develop a “make or buy” model for utilization of instructional technology,
- Practice construction of a multi-purpose learning laboratory
EDUCATION MSED 505  
Research Design and Method (3)  
Research methods, study design and data analytical formats suited to educational projects and problem solving challenges. Scientific method. Identification of an educational research project, creation of a research proposal tailored to an educational need. Incorporation of appropriate measurements suited to the nature of the data.

At the close of this learning experience, participants will be enabled to:
- Identify the major elements of a research proposal,
- Practice framing a proposal in research design and scientific method format,
- Apply a hypothesis to a sample research proposal project.

EDUCATION MSED 506  
Online Course Development and Delivery (3)  
Application level experience in that learners create an online course. Elements of syllabus construction, navigation techniques, discussion board elements, wikis and blogs, final project submissions and other elements. Utilization of Web 2.0 elements. Development of intermediate familiarity with the Learning Management System known as Blackboard.

At the close of this learning experience, participants will be enabled to:
- Construct and evaluate an online course,
- Create challenging interactive activities such as Discussion Boards, Wiki’s and educational Blogs,
- Tailor the online model to health care settings conducive to asynchronous delivery methods.

EDUCATION MSED 520  
Methods and Materials in Simulation (3)  
Development of skills in medical simulation, assistive technologies, and productivity tools for enhancing health care understandings at all levels. Learners employ one of these technologies in creating a learning unit for a clinical discipline OR health care administrative training setting. Develop material and methods for utilization of simulation laboratories, onsite course delivery, and single-day course settings.

At the close of this learning experience, participants will be enabled to:
- Design a learning laboratory congruent with an identified set of learning objectives in the clinical setting,
- Identify simulation methods of choice for economical and effective teaching in the health care setting,
- Develop a learning plan implementing a series of simulation-based activities.

EDUCATION MSED 521  
Clinical Education Methods (3)  
Builds on concepts begun in MSED 503, Methods in Health Care Education, this course provides an opportunity for exploration of resources available for qualitative and effective clinical or organizational learning. Strategies and methods suited to specific needs of a health care unit. Case-based final product incorporating an educational need and problem and method based solution.

At the close of this learning experience, participants will be enabled to:
• Apply advanced diagnostic educational techniques to delivery of selected clinical activities,
• Conduct a group and on-site evaluation of a specific unit educational need,
• Structure a case demonstrating how a specific clinical education need may be resolved by instructional methodology suited to a specific population or patient care setting.

EDUCATION MSED 522
Precepting (3)
Focus on helping new or existing preceptors to gain the teaching, communication, and evaluation skills required to effectively convey key information about roles, responsibilities, and the organizational expectations of a health care unit. Attention to strategies in confidence building, learning activities, feedback and performance review. Special practice in team building for maximization of clinical learning.

At the close of this learning experience, participants will be enabled to:
• Apply an effective precepting model,
• Identify special skills needed by effective preceptors,
• Develop a useable “tool kit” for prospective and existing preceptors and clinical mentors
• Establish a knowledge base for practicing preceptors.

EDUCATION MSED 523
Sustainability Instructional Methods and Materials (3)
Instructional emphasis on teaching ways to use innovative products, services, and production processes that alleviate detrimental social or environmental conditions in health care facilities. Instructional activities that promote efficient use of energy and harness renewable resources that save costs, lower risks, and are less harmful to society in the overall health care environment. Incorporates sustainability theory with techniques of practice change through effective education.

At the close of this learning experience, participants will be enabled to:
• Identify key sustainability instructional resources,
• Assist in the development of a culture change model,
• Structure educational activities which promote and clarify sustainability efforts

EDUCATION MSED 524
Library Resources in Instruction (3)
Methods of conveying awareness of physical and electronic resources in problem solving, research and related areas. Inclusion of automatic linkages to library resources in an online course. Complex searching methods; database linking. Collaborative techniques with resource personnel.

At the close of this learning experience, participants will be enabled to:
• Demonstrate skill in data linkages in all formats of course development,
• Identify ways learners may effectively use and manage data sources in the processes of both teaching and learning,
• Recognize and develop methods of utilizing and improving information retrieval for problem solving and evidence-based patient care.
EDUCATION MSED 525  
Faculty Development (3)  
Construction and delivery of materials for instructional staff development. Maintenance of existing skills; techniques of both active and passive learning activities designed to improve instruction. Program development and outcomes measurement; continuous quality monitoring of methods of staff education.

At the close of this learning experience, participants will be enabled to:
- Construct a workshop series for maximization of faculty development efforts,
- Identify ways of monitoring faculty performance related to program goals,
- Develop learning activities in person and online designed to maintain existing skills and promote new care techniques and emerging trends.

EMERGENCY MEDICAL SERVICES 101  
Emergency Medical Technician – Basic (EMT-B) (3)  
Prepares students to handle emergencies using basic-life support equipment in accordance with objectives of the US Department of Transportation National Standard Curriculum. Prepares students for the Pennsylvania Department of Health Emergency Medical Technician-Basic (EMT-B) examination process. Includes American Heart Association (AHA) Basic Cardiac Life Support (BCLS).

ENGLISH 101  
Composition I (3)  
Develops basic writing skills, including a review of grammar. Includes frequent writing assignments.

ENGLISH 102  
Composition II (3)  
Continuation of English 101. Applies principles of effective written communication. Introduces the methodology of the research paper.  
Prerequisite: English 101

ENGLISH 103  
Business and Technical Writing (3)  
Applies skills of written communication to specific forms that professional and technical personnel are called upon to write reports, abstracts, processes, proposals and correspondence.

ENGLISH 315  
Understanding Poetry (1-3)  
Studies poetry from many cultures and historic eras, including strategies for analysis and appreciation.

FINANCE 101  
Principles of Finance (3)  
Examines principles of financial management in five major areas: (1) financial analysis and planning (ratio analysis, cash budgeting, pro-forma financial statements, and operating and financial leverage); (2) working capital management (the financing decision, sources of short-term financing and controlling assets including cash, receivables, and inventory); (3) capital budgeting (time value of money, annuities, determining investment yields, valuation of securities, rates of return, cost of capital, risk and methods of evaluating capital expenditure alternatives; (4) long-term financing (structure of capital markets,
public and private placements, debt and lease financing, common and preferred stock as financing
methods); (5) review of mergers and acquisitions; international-financial management concepts.
Prerequisites: Accounting 101, Economics 201

HEALTH 101
Personal Health and Wellness (3)
Provides an overview of wellness concepts and theories from interdisciplinary perspectives. Develops
skills, attitudes, beliefs and habits by providing learning experiences that will assist in the achievement
of an optimal level of wellness through self-responsibility. Students plan and implement wellness
activities for individuals and family units.

HEALTH 302
Mindfulness Based Stress Reduction for Personal and Professional Wellness (3-4)
Examines stress physiology, the influence of stress on disease processes, and the substantial evidence-
based research that documents health benefits of MBSR and other mindfulness-based interventions.
Includes the practice of formal mindfulness techniques in weekly sessions and an optional one-day (one
credit) mindfulness retreat. Promotes personal and professional wellness and creates a foundation for
further exploration of
mindfulness-based interventions for those interested in integrating mindfulness into their professional
practice.

HEALTHCARE ADMINISTRATION 300
Health Services Delivery and Organization (3)
Examines the structure, process and outcome of healthcare delivery in the U.S., both historically and in
the present, with special emphasis on current systems of managed care and integration. Discusses
organizational patterns, facilities, reimbursement and manpower in the context of social, political,
ethical and economic forces driving the system. Compares the U.S. system to other systems.

HEALTHCARE ADMINISTRATION 301
Current Issues in Healthcare Delivery (3)
Reviews and examines critical health issues currently affecting the delivery of health care in the United
States and selected countries. Focuses on alternative means of financing and delivering these health
services as well as on new developments in the field.

HEALTHCARE ADMINISTRATION 302
Healthcare Classification Systems (3)
Provides an overview of the classification systems used for reimbursement with emphasis on physician
practices and the billing process. Covers basic coding of diseases and procedures based on the principles
of ICD-9-CM and procedural coding based on CPT-4. Enables people without hands-on experience in
healthcare coding and billing to gain a working knowledge of the fundamentals of healthcare
reimbursement.

HEALTHCARE ADMINISTRATION 303
Business and Healthcare Law (3)
Identifies and examines relevant substantive areas of business law and health law that impact the
operations of healthcare facilities, academic medical centers, and related businesses. Provides thorough
understanding of the legal implications of running a healthcare business, including basic principles of
business law such as torts and contracts, risk management and medical malpractice, ethical issues and regulatory compliance.

HEALTHCARE ADMINISTRATION 350
Principles of Public Health and Epidemiology (3)
Examines disease prevention and infection control undertaken by federal, state and local governments. Delineates roles and responsibilities of public health officers and public health departments, governmental standards, oversight of contagious disease, air and water safety, emergency situations, and health education and behaviors. Considers the limits and strengths of epidemiology in containing and limiting high-risk substances and disease. Cites models of collaboration between public and private sectors to effect positive change toward healthier communities. Discusses role of public health services in light of bioterrorism.
Prerequisite: Healthcare Administration 300

HEALTHCARE ADMINISTRATION 351
Strategic Planning and Marketing for Health Services Organizations (3)
Introduces essential principles and aspects of marketing as applied to the healthcare business marketplace. Presents provider and non-provider activities, marketing strategies and tools. Uses examples from profit and nonprofit health businesses to describe key marketing concepts. Analyzes Internet marketing strategies, including use as a distribution channel and communications forum; business-to-business Internet marketing; shopping on the Internet and on-line selling.
Prerequisite: Management 304 or permission of the Instructor/Chair

HEALTHCARE ADMINISTRATION/ECONOMICS 401
Healthcare Policy and Economics (3)
Applies economic analytical techniques to critical issues in health care and health policy (e.g., growth of healthcare expenditures, intended and unintended consequences of Medicare reform). Examines demand side considerations for health and medical care as well as for health insurance. Explores supply side considerations such as managed care and markets for healthcare professionals and hospital services. Identifies socio-cultural factors, demographic changes, legal and governmental regulations, technological advances and their impact on the economics of healthcare delivery. Provides a framework for a rational assessment of healthcare policy.
Prerequisites: Healthcare Administration 300, Economics 202

HEALTHCARE ADMINISTRATION 410
Medical Practice Management (3)
Presents major components of medical practice management administration, including staffing patterns, selecting and updating practice management systems, information reporting, accounts receivable, contract negotiations, quality assurance, identifying and complying with regulatory requirements, space planning and management, fee schedules, reimbursement monitoring and other organizational issues.
Prerequisite: Healthcare Administration 302

HEALTHCARE ADMINISTRATION 412
Quality Measurement and Outcomes Analysis in Health Care (3)
Examines various quality measures essential to safe, timely and thorough delivery of health care. Considers models for quality measurement in various settings and applies these models to case
examples. Enables students to apply quality measurement and outcomes analysis to the healthcare workplace.
Prerequisites: Management 304, Mathematics 301

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 310
Management Information Systems in Health Care (3)
Examines elements within a management information systems design for health services institutions and organizations. Examines elements of analysis, design, implementation and control through cases, system analysis procedures and effective evaluation modalities.
Prerequisites: Healthcare Administration 300, Computer Studies 201

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 311
Informatics Resources and Technology for Health Services (3)
Examines resources available in on-line databases, public and private web-based offerings, methods for integration of existing resources, evaluation criteria for determining appropriateness of self-development of technological resources and contracting or purchasing.
Prerequisite: Healthcare Management Information Systems 310

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 401
Network Management (3)
Presents principles and practices of developing, implementing and maintaining local area networks (LAN), wide-area networks (WAN), and intranets. Includes system requirement analysis, architectural principles, acquisition processes, installation and maintenance.
Prerequisite: Healthcare Management Information Systems 310

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 402
Systems Design (3)
Analyzes, designs, implements and evaluates information systems in medium-sized and large organizations, including personal and technological interaction, determination of inputs and outputs as required by end users, hardware match and comprehensive systems integration.
Prerequisite: Healthcare Management Information Systems 310

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 410
Information and the Health Services Organization: Advanced Seminar in Health Services Information Systems (3)
Capstone seminar for BS-HSMIS taken concurrently with the internship (HMIS 411). Integrates theory and practice of healthcare management information systems, including maximization of resources, integration elements, determination of need, systems assessment, team integration and personnel selection in comprehensive HIS oversight. Reviews practical management principles applied to technological and informatics resources. Students prepare research projects relevant to their internship.
Prerequisite: Completion of all major course requirements for the BS-HSMIS

HEALTHCARE MANAGEMENT INFORMATION SYSTEMS 411
Internship (3)
Supervised fieldwork in an approved healthcare facility/organization under the direction of an approved preceptor in that facility/organization. Serves as a practicum in which students carry out responsibilities related to health services information systems management.
Prerequisite: Completion of all major course requirements for the BS-HSMIS. Taken concurrently with HMIS 410: Leadership and Strategy: Advanced Seminar

**HISTORY 101**  
**World Civilization to 1500 (3)**  
Surveys origins and diffusion of civilization from antiquity to the late fifteenth century. Emphasizes environmental and cross-cultural influences on the development of the major civilizations of Eurasia, Africa and the Americas. Develops critical thinking and communication skills by analyzing, evaluating and summarizing historical data.

**HISTORY 102**  
**World Civilization Since 1500 (3)**  
Surveys interactions among the major centers of civilization from the European voyages of discovery through the late 20th century. Emphasizes technological, economic and demographic influences on the emergence of a global community. Develops critical thinking and communication skills by analyzing, evaluating, and summarizing historical data.  
Prerequisite: History 101

**HISTORY 111**  
**United States History to 1865 (3)**  
Surveys U.S. political and economic development from colonial times to the end of the Civil War. Emphasizes emergence and consolidation of the American union and the evolution of national institutions.

**HISTORY 112**  
**United States History Since 1865 (3)**  
Surveys the political and economic development of the United States from end of the Civil War to the present. Emphasizes impact of industrialization and urbanization on national policy and institutions. Discusses emergence of the United States as a major world power in the 20th century. Develops and enhances critical thinking and communication skills by analyzing, evaluating and summarizing historical data.  
Prerequisite: History 111

**HUMANITIES 111**  
**Philadelphia and the Arts (3)**  
Studies the humanities through the museums, theaters, architecture and art of Philadelphia. Supplements lectures and class discussions with visits to artistic sites.

**HUMANITIES 301**  
**Problems of Pain and Suffering (3)**  
Examines the problem of human pain and suffering from a multidisciplinary perspective. Analyzes the roles of literature, religion, philosophy and sociology in the pain/suffering experience. Provides a basic understanding of pain, clinically emphasizing pain management modalities.
HUMANITIES 311
Human Values (2-3)
Examines human values such as truth, beauty, love, power and wealth. Western, non-western and indigenous texts are drawn from historical and contemporary sources in philosophy, literature and the mass media.

HUMANITIES 315
Methods of Effective Thinking (3)
Provides a conceptual framework and practical “tools” for understanding complex human systems, e.g., families, work teams, organizations, and larger societal institutions. Designed to hone skills and provide practice in critical and systemic thinking.

IDSC 302
Understanding Research Principles and the Scientific Method (3)
Introduces research methodologies applicable to health care and the health professions. Emphasizes research methodologies (from qualitative and descriptive to quasi-experimental and experimental), the application of research approaches to health professions-based research questions, and the analysis of reported research. Prepares and requires students to conduct literature searches relevant to the department or researchable questions and appropriate research designs and to become critical consumers.

IDSC 303
Advanced Research Project Analysis
Real time research on a topic selected during ID 302 or determined in consultation with the instructor. Participants refine a comprehensive proposal, conduct a pilot study to form a research hypothesis and present findings in a final seminar session.
Prerequisite: IDSC 302 or equivalent

IDSC 402
Interdisciplinary Clinical Care Planning (1 or 3)
Prepares students for active roles in interdisciplinary healthcare planning. Emphasizes principles of group dynamics and familiarization with the roles and functions of the health professions. Enables teams of students to develop interdisciplinary planning skills and to develop comprehensive healthcare plans for simulated patient situations.

MANAGEMENT 101
Principles of Management and Organizational Behavior (3)
Examines organizational behavior as an academic discipline and develops skills necessary for successful practice of management. Examines the effect individuals, groups and organizational structure have on behavior within an organization. Applies the knowledge gained to make organizations operate more efficiently. Ultimate functional applications include improving productivity and the creation of an environment that fosters a high quality of work life and concomitant job satisfaction.

MANAGEMENT 102
Human Resources Management (3)
Discusses principles, policies and practices of rational systems for management of human resources in organizations. Covers human resource planning, fair employment practice, staffing organizations, career
development, performance appraisal, training and development, compensation and employee benefits and services. Uses case analysis, films and student reports to promote application of the material.

Prerequisite: Management 101

MANAGEMENT 201
Principles of Marketing (3)
Provides an overview of marketing concepts and principles applicable to businesses and organizations. Covers marketing environment and buyer behavior, market segmentation and targeting, product development, pricing, promotion and distribution for target markets.

MANAGEMENT 304
Management and Organizational Theory in Health Services Organizations (3)
Explores the structure and function of healthcare delivery organizations with respect to challenges presented by contemporary socio-cultural considerations, demographic changes, government and legal regulations and technological advances. Analyzes the effect of these environmental factors on traditional roles, communication patterns, financial strategies and organizational structure. Identifies methods to assess the organization’s ability to provide and monitor quality healthcare services and to meet the requirements set by both internal and external bodies.

Prerequisites: Management 101, Healthcare Administration 300

MANAGEMENT 407
Financial Management of Health Services Organizations (3)
Combines selected topics of accounting and finance to understand the process of quantifying, analyzing and managing financial resources in the unique environment of health-care. Introduces quantitative techniques used to appropriately allocate financial resources, accounting information used in such techniques, as well as strategies for financial management based upon these analyses. Emphasizes the role of managed care in the financial decision making process. Considers the hospital, the largest institutional component of the industry; extends application beyond the hospital setting through discussions, readings and case materials.

Prerequisites: Accounting 102, Economics 202, Finance 101, Management 304, Mathematics 301 or equivalent

MANAGEMENT 408
Program Planning and Evaluation in Health Services Organizations (3)
Presents the foundations of health planning, its historical evolution, current planning issues and evaluation techniques, and the dynamic relationship between the free market system and government regulation. Reviews the methodology of planning effectively for healthcare services. Incorporates use of data systems for forecasting and identifying problems as well as the process of strategic planning, setting priorities, developing projects and allocating resources.

Prerequisites: Healthcare Administration 300, Management 304, 407

MANAGEMENT 410
Leadership and Strategy: Advanced Seminar in Health Services Management (3)
Capstone seminar for BS-HMS taken concurrently with Management 411 Internship. Integrates theory and practice of health services management. Students prepare research papers in areas of health services management relevant to their field experience (internship).

Prerequisite: Completion of all major course requirements for the BS-HSM degree
MANAGEMENT 411
Internship (3)
Supervised fieldwork in an approved healthcare facility/organization under the direction of an approved preceptor in that facility/organization. An exercise in applied healthcare management, students carry out responsibilities related to health services management.
Prerequisite: Completion of all major course requirements for the BS-HSM degree. Concurrent with MGMT 410: Leadership and Strategy: Advanced Seminar

MATHEMATICS 100
Introduction to College Algebra (3)
Provides ample drill and practice to prepare students for college algebra. Includes operations with real numbers, solutions of linear and quadratic equations, graphs of linear equations and problem-solving skills. Employs a scientific calculator both as a tool in concept development and an aid in computation. Portrays algebra as a logical extension of arithmetic. Cannot be used to fulfill degree or certificate requirements.

MATHEMATICS 101
College Algebra (3)
Presents operations with real and complex numbers, graphing first- and second-degree equations, solutions of equations (linear, quadratic and logarithmic). Portrays algebra as a logical extension of arithmetical processes and as a powerful tool for analyzing relation- ships in the natural and social sciences.
Prerequisite: Mathematics 100 or equivalent

MATHEMATICS 102
Precalculus (3)
Includes a review of algebra with an emphasis on techniques necessary for calculus, solutions of inequalities and equations (linear, quadratic, exponential, logarithmic and trigonometric), techniques for graphing functions (polynomial, exponential, and trigonometric) as well as the conic sections (analytic geometry), vectors and polar equations in preparation for a calculus course.
Prerequisite: Mathematics 101 or equivalent

MATHEMATICS 103
Calculus (3)
Includes limits, differentiation and integration of a single variable in order to analyze polynomial, rational, exponential and logarithmic functions. Portrays calculus as a logical extension of algebraic processes and a powerful tool for modeling relationships in managerial, life and social sciences.
Prerequisite: Mathematics 101 or equivalent

MATHEMATICS 301
Statistics (3)
Surveys basic techniques and principles of statistical analysis, both descriptive and analytical. Descriptive statistics includes univariate measures of central tendency and dispersion, bivariate cross-tabulation and correlation and regression analysis. Inferential statistics includes point and parameter estimation and hypothesis testing techniques. Emphasizes health-related examples and incorporates the latest software technology in the health field.
Prerequisite: Mathematics 101 or higher; Mathematics 102 recommended
NUTRITION 301
Current Concepts in Nutrition (3)
Explores the relationships of essential nutrients and dietary substances to health maintenance and disease prevention. Discusses factors that influence food choices. Analyzes dietary intake and eating habits. Emphasizes personal nutrition education and how to evaluate nutrition information found in the media and consumer marketplace.

PHILOSOPHY 101
Introduction to Philosophy (3)
Introduces problems and methods of philosophic thought, including the influence of philosophy in everyday life. Examines the thinking of great philosophers on the nature of reality, human freedom, foundations of knowledge, standards of values and the existence of God.

PHILOSOPHY 201
Philosophy of the Human Person (3)
Encourages students to understand and formulate a unified theory of the human person through discussion of selected works of various thinkers from classical antiquity to the present day. Presents various approaches to the study of the human person and the mystery of the human person. Compares and contrasts Eastern and Western views of the human person.

PHILOSOPHY 301
Healthcare Ethics (3)
Examines moral questions arising from advances in technology, life sciences, medicine, nursing and other health professions. Defines moral theories, principles, virtues, rights and obligations relevant to bioethical concerns such as informed consent, human experimentation, allocation of medical resources, truth-telling and death. Analyzes case studies and current news reports for bioethical issues.
Prerequisite: Healthcare Administration 300

PHILOSOPHY 401
Decision Making in Health Care (3)
Provides methods for identifying problems, possible solutions and justification of conclusions by the use of elementary logic and linguistic analysis as applied to actual problems occurring in the health professional’s daily work.

POLITICAL SCIENCE 101
Government of the United States (3)
Examines principles of democracy and presents background, description and analysis of the national government of the United States.

PROFESSIONAL AND CONTINUING STUDIES 120
Comprehensive Medical Terminology (4)
Introduces a comprehensive medical vocabulary arranged according to body systems. Presents medical terms for organs, diseases, symptoms, diagnostic procedures, treatments and surgical procedures. Introduces a method for defining medical terms by dividing them into roots, prefixes and suffixes. Includes practice in building medical terms.
PROFESSIONAL AND CONTINUING STUDIES 499
Independent Study (1 to 3)
The student, under faculty supervision, designs and studies an area or topic not included in the formal curriculum. Emphasizes individual study and research. Requires the student to obtain faculty sponsorship.
Prerequisite: Completion of 15 semester credits at Jefferson with a minimum grade point average of 3.00 and approval of Department Chair

PSYCHOLOGY 101
Introduction to Psychology (3)
Introduces basic principles and major theoretical approaches used in the scientific study of human behavior. Emphasizes understanding and application of theories as they relate to individuals and the human environment. Presents attitudes and methods employed by the psychologist in understanding normal and abnormal behavior.

PSYCHOLOGY 102
Developmental Psychology (3)
Explores patterns of human development throughout the life span. Discusses concepts important to maturation and learning. Covers attachment, childhood aggression, parenting styles, effects of the peer group, blended families, the development of self-esteem, social influences on identity, love and marriage, issues of mid-life, adjustment to late adult-hood, death and dying. Includes recent social trends and their impact on human development.
Prerequisite: Psychology 101

PSYCHOLOGY 301
Educational Psychology (3)
Introduces psychology bases of instructional systems. Examines development and learning of children, adolescents and adults; teacher behavior and other applications of psychology to education. Covers construction, validation and use of classroom measurement and diagnostic procedures.
Prerequisite: Psychology 101

PSYCHOLOGY 323
Psychology of Adulthood and Aging (3)
Describes the interaction of biological, psychological and sociological factors on adult development and aging. Covers significant developmental theories and the role of families, work, sex differences and personality from young adulthood to death and dying. Discusses stereotypes and self-concept as factors in coping with the biological process of aging.

PSYCHOLOGY 361
Abnormal Psychology (3)
Surveys principal forms of behavior disorders, including theories of origin, symptoms, developments and treatment.
Prerequisite: Psychology 101
PSYCHOLOGY 423  
Current Issues in Human Sexuality (3)  
Provides contemporary issues in human sexuality and how they affect and are affected by life-cycle development. Integrates three major areas: sexuality issues through the life cycle; the sexual spectrum and diversity; and sexual traumas and conflicts. Examines students’ values and attitudes toward sexual issues.

SOCIOLOGY 101  
Introduction to Sociology (3)  
Studies society through a social or group perspective by reexamining issues such as welfare, street crime and the homeless. Covers social structure, basic human institutions, analysis of social processes and major social forces, including the family, deviance, health, education, social change, and social and cultural diversity.

SOCIOLOGY 302  
Introduction to Group Dynamics (3)  
Introduces general principles of behavior processes and their applications within established groups and organizations.

SOCIOLOGY 401  
Sociology of Health (3)  
Reviews health and health services delivery systems as viewed by the social scientist, including factors affecting mortality, morbidity and demography of health. Addresses the influences of values, culture and customs on health and health-seeking behavior, as well as roles and relationships of the patient, the health professional and others in the care giving process.

GRADUATE INTERDISCIPLINARY COURSES  
IDSC 501  
Pharmacology in Rehabilitation (3)  
Provides an overview of major classes of drugs with an emphasis on their mechanisms of action, rationale underlying therapeutic uses, adverse reactions and drug interactions. Includes written assignments in students’ areas of interest.

IDSC 502  
Mindfulness Based Stress Reduction for Personal and Professional Wellness (3-4)  
Examines stress physiology, the influence of stress on disease processes, and the substantial evidence-based research that documents the health benefits of MBSR and other mindfulness-based interventions. Includes practice of formal mindfulness meditation techniques in weekly sessions and an optional one-day mindfulness retreat. Promotes personal and professional wellness and creates a foundation for further exploration of mindfulness-based interventions for those interested in integrating mindfulness into their professional practice.
**IDSC 510**  
**Accent Reduction (3)**  
Assists learners in improving overall intelligibility through accent modification. Targets individual pronunciation problems to achieve improvements in English speech and communications. Builds confidence in social and academic speaking situations.  
Prerequisite: ESL 301 or Departmental permission.

**IDSC 512**  
**Current Topics in Healthcare Law (3)**  
Introduces working concepts of the American legal process and techniques of their implementation. Broadly covers tort liability and considers applications of medical professional liability via negligence theory. Emphasizes resource allocation and the healthcare dollar to illustrate constraints and choices in a consumer society of limited resources.

**IDSC 513**  
**Managing People (3)**  
Explores supervisory issues in healthcare settings for professionals who are new (less than two years) to supervisory positions. Presents theories of supervision and provides skill development in problem solving, conflict management, leadership, group process and interpersonal relations.

**IDSC 514**  
**Organization Development (3)**  
Presents a social-psychological perspective of the study of organizations. Presents strategies of organizational change, organization development as an independent concept and specific skills needed by organization development consultants. Addresses formal and informal power in organizations. Applies strategies effective to real-life situations.

**IDSC 515**  
**Neurobiology and Endocrinology (3)**  
Advances knowledge of the nervous system and its physiological mechanisms. Topics include how sensory information is perceived and transmitted, pattern recognition and central processing of information, learning and memory, and how behavior is generated and organized. Combines information with basic neurochemistry and neuropharmacology to apply it to selected neurological disorders.

**IDSC 516**  
**Designing Client-Centered Health Promotion Web Sites (3)**  
Provides information and practical experiences related to interactive health communication in order to design an e-health promotion website for an underserved population. Students work in interdisciplinary teams and apply interactive health communication knowledge to construct an interdisciplinary health promotion website for homeless individuals with chronic mental and physical health conditions; the website will assist in the management of their chronic health conditions on an ongoing basis.  
Prerequisite: ID 310 or an equivalent health informatics course
IDSC 517
Introduction to Pharmacology (3)
Provides an overview and synthesis of basic mechanisms of drug action and the ways in which drugs interact with biological tissue. Emphasizes drug receptors, agonists and antagonists and predictability of many drug actions and side effects. Covers routes of administration, absorption, distribution and elimination, receptor theory, the nervous system and each major class of drugs.

IDSC 520
Issues in Physiology (3)
Discusses current issues in physiology involving the major organ systems. Explores these issues in depth at the metabolic, cellular and systemic levels. Integrates the knowledge and material at these different levels. Enables the student to better appreciate the field of physiology while preparing the individual for further study.

IDSC 521
Adult Development: Continuity and Change (3)
Explores the nature of adult development as influenced by external factors such as work, family and social systems and internal factors such as personality, identity and defense mechanisms. Prerequisite: Psychology 323 or equivalent

IDSC 522
Marketing Healthcare Services and Programs (3)
Presents an overview of marketing techniques specific to healthcare services and programs. Explores the use of market research data in making strategic decisions. Applies techniques to the current healthcare environment through case studies and projects.

IDSC 523
Cardiac/Renal Physiology (3)
Provides a detailed analysis of physiological and biophysical processes that regulate cardiovascular and renal function. Develops understanding of the interrelationship between these two organ systems in health and disease. Emphasizes structure as it relates to function, electrophysiology, muscle mechanics, blood rheology, countercurrent theory and cellular transport. Employs journal articles to illustrate current research in special areas of cardiorenal physiology.

IDSC 524
Psychosocial Aspects of Disability (3)
Studies psychological, social and behavioral concepts related to disability as they apply to allied health professionals. Emphasizes importance of patient motivation, social support systems and psychosocial developmental needs in the rehabilitation process. Discusses role of the helping person with regard to value and authority/power dynamics.

IDSC 526
Accounting and Finance for Managers (3)
Introduces roles of accounting and finance in the healthcare industry. Covers basic concepts and their practical applications. Exposes students to a variety of financial professionals.
IDSC 527  
Statistics, Epidemiology and Inference in the Health Sciences (3)  
Presents fundamental concepts and methods of biostatistics and epidemiology. Emphasizes implications of various analytic approaches and their impact on decision-making and inference in the health sciences. Includes research design; concepts of probability, risk and sampling; measures of disease impact; screening procedures; analysis of treatment effects; and factors affecting the distribution of disease. Prerequisite: Mathematics 301

IDSC 540  
Launching New Ventures: An Entrepreneurial Approach (3)  
Approaches the process of launching a new organizational venture from a wholly practical standpoint. Starts with the premise that successful businesses are built before they ever open their doors. Facilitates the pre-venture planning process through such mechanisms as feasibility plans, business plans, marketing plans, operational plans, incorporation checklists and new product checklists.

IDSC 550  
Care of the Elderly: An Interdisciplinary Approach (3)  
Using a team approach and person-environmental theories, students design and field-test comprehensive services for individuals and their caregivers incorporating formal and informal social systems.

IDSC 560  
Advanced Pharmacotherapeutics (3)  
Examines selected topics in contemporary pharmacotherapeutics such as hypertension, diabetes, infectious diseases and women’s health issues. Selects appropriate drug therapy for patients presenting with one of the selected disease states and develops a monitoring and outcome pharmacotherapeutic plan for the patient. Emphasizes rational decision-making skills in selecting drug therapy for patients of various social, economic and cultural backgrounds.

IDSC 570  
Financial Management of Healthcare Organizations (3)  
Examines the financial environment of healthcare institutions, including sources of revenue such as Blue Cross/Blue Shield, Medicare/Medicaid and HMO’s (health maintenance organizations). Examines alternate methods of financial capital investment in conjunction with capital expenditure controls. Prerequisites: ID 514, 526

IDSC 580  
Providing Community Consultation in Health Care (3)  
Teaches healthcare providers how to structure and deliver health services as a consult-ant in the community. Presents various consultation models and explores how they shape professional behavior and focus. Introduces health intervention techniques and provides opportunities to observe and practice these techniques in the classroom and on-site in community locations.

IDSC 585  
Interdisciplinary Team-based Health Services for Underserved Populations I (3)  
Provides information and experiences that meet both cognitive and affective learning objectives related to working as part of an interdisciplinary team providing community-based services to an underserved
population. Develops team-building skills, integrating discipline-specific knowledge into an interdisciplinary framework, expanding key concepts on the biological, psychological and social aspects of underserved populations, and participating in interdisciplinary community-oriented services, including health promotion and restoration for homeless individuals.

**IDSC 586**
**Interdisciplinary Team-based Health Services for Underserved Populations II (3)**
Continuation of ID 585. Didactic experiences assist students in: a) improving and refining team skills through ongoing evaluation, b) implementing and evaluating interdisciplinary team-based health care, c) generalizing strategies of health care for individuals who are homeless to other underserved populations, and d) understanding linkages among theory-based practice, research, and health policy in the development and delivery of community-based health care to underserved populations. Practicum provides the opportunity to a) function as members of an interdisciplinary healthcare team, b) participate in case management and consultation, c) implement and test interdisciplinary team-based strategies of health care, and d) design solutions to current legal, ethical or public policy issues regarding care of individuals who are homeless, and to discuss these solutions with service providers and health policy makers.

**IDSC 589**
**Human Services Techniques (3)**
Advances essential interpersonal skills for helping people with emotional, developmental, social or physical problems, both inside and outside the organized human service delivery system. Applies these skills to various therapeutic, supportive and preventive settings. Presents skills training in interviewing, counseling, stress management and group work. Enables health professionals from all specialties to learn about themselves and how they relate to others.

**IDSC 590**
**Family Systems and Health Care: A Multicultural Perspective (3)**
Presents a family-centered approach to the psychosocial needs of families dealing with chronic and life-threatening health problems in children and adults. Examines families from a multicultural perspective as they move through a variety of contexts. Challenges and guides the student health clinician’s own beliefs and assumptions to promote healthy family functioning.

**IDSC 595**
**Ethics and Scientific Method (3)**
Examines the ethical character of scientific medicine. Explores ethical values and visions of medical researchers and how racial, social and scientific prejudices affect the design of experiments and implementation of research.

**IDSC 627**
**Approaches to Management and Supervision (3)**
Explores strategies for effective supervision, including personal and group communication skills, program development, strategic planning, problem-solving and staff evaluation, coaching, supervision and discipline. Using the adult learning continuum, students analyze their learning and supervisory style, develop a program change strategy, deal with and resolve conflict, empower staff members to participate in department management and effect change in a specific program.
IDSC 630  
Applied Exercise Physiology (3)  
Applies principles of Medical Physiology and other clinical courses in which conditions/diseases are discussed in relation to exercise as an intervention. Presents principles of exercise physiology (metabolic, cardiovascular, pulmonary, muscular) along with information or nutritional considerations. Demonstrates practical applications of spirometry and submaximal exercise testing in the laboratory. Exposes students to how exercise prescription is directed when selected pathology is present and assists them in developing unique exercise programs for those pathologies.  
Prerequisite: CPR certified, BIOL 110, 111 or permission of the instructor
DEPARTMENT OF RADIOLOGIC SCIENCES
The Department of Radiologic Sciences prepares students for careers in diagnostic medical imaging, radiation therapy and medical dosimetry. As the radiologic sciences field has become more advanced and complex, a need exists for proficient, multi-skilled professionals. A radiologic sciences professional operates sophisticated equipment to produce optimal diagnostic images or treatments, has the knowledge to identify normal and abnormal anatomy and physiology, and is responsible for the well-being of patients in his/her care.

To meet the challenges of the present and future of health care, the diagnostic medical imager, radiation therapist or medical dosimetrist must function competently and compassionately in an expanding, multi-faceted role. Recent trends and advances in the delivery of health care indicate that the radiologic sciences curriculum must provide the student with opportunities to develop knowledge and skills in more than one concentration within the profession. Of equal importance is the need for the graduate to understand the relationships of the various imaging and therapy specialties to patient care. Graduates have the opportunity to pursue careers in a variety of areas, including clinical practice, education, management, sales and research in the radiologic sciences.

Graduates of the two-year and one-year baccalaureate programs are eligible to take the associated certification examinations of the American Registry of Radiologic Technologists (ARRT), American Registry of Diagnostic Medical Sonographers (ARDMS), Cardiovascular Credentialing International (CCI), Medical Dosimetrist Certification Board (MDCB) and Nuclear Medicine Technology Certification Board (NMTCB), as applicable. Students who pass these examinations receive national certification.

MISSION
The mission of the Department of Radiologic Sciences is to provide a comprehensive education preparing students for entry-level practice in radiologic and imaging sciences as competent, caring members of the health care team, cultivating professionalism and life-long learning.

PROGRAM ACCREDITATION
- The General Sonography, Cardiac Sonography and Vascular Sonography Programs are accredited by the Commission on Accreditation of Allied Health Educational Programs (CAAHEP) in collaboration with the Joint Review Committee on Education in Diagnostic Medical Sonography (JRCDMS).
  - CAAHEP can be contacted at 1361 Park Street, Clearwater, FL 33756, (727) 210-2350, (727) 210-2354 (fax), mail@caahep.org or www.caahep.org
  - JRCDMS can be contacted at 6021 University Boulevard, Suite 500, Ellicott City, MD 21043, (443) 973-3251 (fax), jrcdms@intersocietal.org or www.jrcdms.org.
- The Magnetic Resonance Imaging, Medical Dosimetry, Radiography and Radiation Therapy Programs are accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT).
  - JRCERT can be contacted at 20 N. Wacker drive, Suite 2850, Chicago, IL 60606-3182, (312) 704-5300, (312) 704-5304 (fax), mail@jrcert.org or www.jrcert.org.
- The Nuclear Medicine Program is accredited by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT).
  - JRCNMT can be contacted at 2000 W. Danforth Rd., Suite 130 #201, Edmond, OK 73003, (405) 285-0546, (405) 285-0579 (fax), jrcnmt@coxinet.net or www.jrcnmt.org.
BACCALAUREATE DEGREE PROGRAMS IN RADIOLOGIC SCIENCES
The Department of Radiologic Sciences offers three Bachelor of Science (BS) pathways:

Two Year Programs
The two-year dual concentration programs allow students who do not have an education in the radiologic sciences or in a health discipline the option to acquire training in a combination of radiologic sciences areas. Two areas of study are selected from a list of 13 options listed below. Each student must consult with a University admissions counselor and a Radiologic Sciences faculty member to ensure that he/she has met the prerequisite requirements for both of the selected options. Students earn a Bachelor of Science degree in Radiologic Sciences upon completion of the program. The program is full-time and begins in the fall. Two year students may not be eligible to take professional certification examinations until the BS is awarded at the completion of the two-year program.

Imaging Options
Cardiac Sonography, Computed Tomography*, General Sonography, Invasive Cardiovascular Technology*, Magnetic Resonance Imaging, Nuclear Medicine, Radiography, Vascular Sonography

Radiation Oncology Options
Medical Dosimetry*, Radiation Therapy

Non-Imaging Options
Education*, Health Management*, Healthcare Information Systems*

* Second year only

Acceptance Policy for 2-Year Students
The Department does not guarantee acceptance into the program of choice for students entering the second year of a 2-year dual concentration program. Program acceptance may require all or some of the following:
• GPA
• Letters of recommendation
• Interview by program director

One Year Programs
The one-year programs in Radiologic Sciences are designed for students who have 50 prerequisite credits and a baccalaureate degree, or 50 prerequisite credits and professional experience or certification for which they will receive an additional 39 professional credits. Students earn a Bachelor of Science degree in Radiologic Sciences upon completion of the program. The program is full-time and begins in the fall.

Students who have 50 prerequisite credits and a baccalaureate degree are eligible to apply to the following AP programs:
• Cardiac Sonography
• General Sonography
• Magnetic Resonance Imaging
• Medical Dosimetry
Students who have 50 prerequisite credits and certification in or have graduated from an accredited program* in radiologic sciences or other related health fields may apply to the following AP programs:

- Cardiac Sonography
- Computed Tomography – requires ARRT(R), (T), (N) or NMTCB CNMT
- General Sonography
- Invasive Cardiovascular Technology – requires ARRT(R) or ARDMS RDCS/RVT
- Magnetic Resonance Imaging
- Medical Dosimetry – requires ARRT(T)
- Nuclear Medicine
- Radiation Therapy
- Radiography
- Vascular Sonography

*The program must be accredited by one of the following agencies:

In the US:
- CAAHEP (Commission on Accreditation of Allied Health Education Programs)
- JRCDMS (Joint Review Committee on Education in Diagnostic Medical Sonography)
- JRCCVT (Joint Review Committee on Education in Cardiovascular Technology)
- JRCERT (Joint Review Committee on Education in Radiologic Technology)
- JRCNMT (Joint Review Committee on Education in Nuclear Medicine Technology)
- One of the six regional accrediting organizations

Outside of the US:
- Conjoint Secretariat of Canadian Medical Association
- Australian Institute of Radiography

Part-Time Program
Certified radiographers, radiation therapists or nuclear medicine technologists, with or without a baccalaureate degree, but with 50 prerequisite credits, may enroll in the Computed Tomography (CT) program on a part-time basis. Students earn a Bachelor of Science degree in Radiologic Sciences upon completion of the program. Students must consult with either the Chair of the Department or the Program Director of the program in which they wish to enroll. This part time program must be completed within 2 years of start date.

Prerequisites
- For Computed Tomography program: Certification as a radiologic technologist, ARRT(R), (T), (N) or CNMT and completion of 50 prerequisite credits.

DESCRIPTION OF RADIOLOGIC SCIENCES MODALITIES

Cardiac Sonography
Cardiac sonography is a safe procedure using high-frequency sound waves to diagnose cardiovascular disease. It produces a real-time view of the heart chambers, valves, muscles and blood vessels. A cardiac
sonographer, also referred to as an echocardiographer, is a highly skilled professional who is instrumental in the evaluation of congenital and acquired cardiac abnormalities and associated complications. Cardiac sonography can be used to determine causes of chest pain, establish a baseline for reference in tracking chronic heart conditions, evaluate the effects of heart disease, diagnose narrowed or leaking heart valves, determine the need for intervention and evaluate the effectiveness of previous treatment.

**Computed Tomography**
Computed Tomography (CT) uses x-rays and a computer to acquire a set of data from multiple angles around the patient’s body and produce high-resolution cross-sectional images, known as tomographic slices. Innovations, including spiral/helical and multi-slice CT, mean that CT is a rapid technique with many applications. A CT technologist is responsible for operating sophisticated equipment, performing venipuncture, and monitoring patient’s radiation dose.

**General Sonography**
General sonography, commonly called ultrasound, is a diagnostic medical procedure that uses high frequency sound waves to produce dynamic visual images of organs, tissues, or blood flow inside the body. A diagnostic medical sonographer is a highly skilled professional who uses specialized equipment to create images that are interpreted by physicians for medical diagnosis. Sonographers have extensive, direct patient contact. They must be able to interact compassionately and effectively with people who range from healthy to critically ill. General sonography includes the abdomen, pelvis, obstetrics, breast, superficial structures and associated blood vessels. It is also used to guide fine needle, tissue biopsy to assist in taking a sample of cells from an organ for laboratory testing.

**Invasive Cardiovascular Technology**
Cardiac catheterization is a specialized study of the heart and coronary arteries. Under x-ray guidance, the cardiologist inserts a tiny catheter into a chamber or vessel of the heart to perform diagnostic or treatment procedures. The invasive cardiovascular technologist studies the theory of techniques used in diagnosis, treatment and follow-up of cardiovascular disease in patients. The technologist assists in all phases of cardiac catheterization procedures, as well as the care of patients during the procedures.

**Magnetic Resonance Imaging**
Magnetic resonance imaging (MRI) uses low energy electromagnetic waves in conjunction with a magnetic field to create high-resolution images of the human body. MRI offers superior inherent tissue contrast resolution, direct multiplanar imaging capability and multiparametric image intensity, without bone artifacts and without producing adverse biologic effects. It is a dynamic field still in its infancy with ample opportunities for growth and advancement.

**Medical Dosimetry**
Medical dosimetry is a subspecialty of radiation oncology that deals with treatment planning, dose measurement, dose calculations and quality assurance of radiotherapy designed to treat cancer. Medical dosimetrists plan and calculate ionizing radiation dose under the direction of a medical physicist and physician, and assist in clinically implementing the treatment plans. Primary duties include fabricating treatment plans, contouring normal anatomy on CT images, helping create immobilization devices, aligning beams, planning or fabricating beam-modifying devices, calculating monitor units, participating in radiation protection, detecting equipment problems and assisting in the planning of
brachytherapy. Some medical dosimetrists are also involved in clinical research for the development and implementation of new cancer treatment techniques.

**Nuclear Medicine**
Nuclear medicine studies involve the administration of small amounts of radioactive material, followed by imaging of the emitted gamma radiation with specialized scanning equipment. The images produced demonstrate the physiologic and functional status of the body under various pathologic conditions, and contribute to earlier identification of abnormalities. Recently the nuclear medicine field has expanded to include molecular imaging using positron emission tomography (PET), and fusion imaging using hybrid scanners, such as PET/CT. Besides clinical imaging, other nuclear medicine applications include radionuclide therapy, radioimmunotherapy, and *in vitro* (non-imaging) procedures.

**Radiation Therapy**
Radiation Therapy is the medical use of high energy beams of ionizing radiation as part of the cancer treatment to control malignant cells. Primary duties of radiation therapists include delivering radiation therapy treatments to patients under the direction of the physician, creating immobilization devices, participating in radiation protection, and fabricating beam modifying devices. Radiation therapy can be used alone or in combination with surgery and chemotherapy. Radiation therapists use cutting edge technology and advanced computer systems to ensure accuracy and effectiveness in the treatment delivery. They are highly skilled, detail-oriented, and compassionate members of the cancer management team.

**Radiography**
Radiography is an indispensable diagnostic tool of modern medicine. It is the art and science of using x-rays to produce images of the tissues, organs, bones and vessels of the body. The radiographer is responsible for accurately positioning the patient and applying only the amount of radiation necessary to produce high-quality images. The radiographer understands the characteristics of radiation, its biological effects and the methods of reducing patient and operator exposure while obtaining optimal diagnostic information for the radiologist.

**Vascular Sonography**
Vascular sonographers assist physicians in the diagnosis of a variety of disorders affecting the vascular system. Using a wide range of instrumentation, vascular technologists acquire and record information related to blood vessel anatomy and physiology. Although ultrasound instrumentation is most commonly used, other instruments may also be used to measure parameters such as blood pressure, limb volume changes, and oxygen saturation. Segments of the vascular anatomy typically examined include the cerebral, peripheral, and the abdominal circulations.

**CURRICULUM FOR RADIOLOGIC SCIENCES MODALITIES**
Note the following adjustments in curriculum for certain programs:

1. Course adjustments are made in two-year dual concentration programs with repeat courses.
   a) ICVT students proceeding from Cardiac Sonography or Vascular Sonography will take RSI 313, RSI 341 and RSI 342.
   b) ICVT students proceeding from Radiography will take RSI 302, RSI 311 and RSI 312.
2. Independent study courses may vary from 1 to 4 semester credits.
3. All Non-Imaging courses (Education, Health Management and Healthcare Information Systems) are taught by the Department of Professional and Continuing Studies.
4. The Department of Radiologic Sciences reserves the right to make adjustments to the curriculum as necessary.

Descriptions for all courses listed are in the section entitled “Radiologic Sciences Course Descriptions.”

**Cardiac Sonography**

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<tr>
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<td>Patient Care &amp; Services in Medical Imaging &amp; Radiation Oncology</td>
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<td>RSCS 331</td>
<td>Cardiac Procedures I</td>
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<td>Cardiac Principles I</td>
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<td>RSCS 400</td>
<td>Ultrasound Physics I</td>
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<td>RSCS XXX</td>
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<td>RSCS 332</td>
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<td>RSCS 352</td>
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<td>Noninvasive Testing Principles and Procedures</td>
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<td>RSCS 413</td>
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**TOTAL** 46
## Computed Tomography

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<td>RSC 431</td>
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<td>RSC 451</td>
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**TOTAL** 38

## General Sonography

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<td>Oncology</td>
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<td>RSS 400</td>
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<td>Sonography Cross-Sectional Anatomy</td>
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<td>Abdominal Sonography I</td>
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<td>Pelvic Sonography</td>
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<td>RSS 415</td>
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<td>RSS 405</td>
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<td>RSS 413</td>
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<td>RSS 416</td>
<td>High Resolution Sonography</td>
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<td>RSS 417</td>
<td>Sonography Procedures II</td>
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<td>RSS 498</td>
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**TOTAL** 48
### Invasive Cardiovascular Technology

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<td>RSI 312* Cardiovascular Pathophysiology*</td>
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<td>RSI 302* Noninvasive Testing Principles &amp; Procedures*</td>
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<td>RSI 342** Radiographic Physics &amp; Instrumentation II**</td>
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#### Semester III

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#### TOTAL

* Students coming from Radiography only.

** Students coming from Cardiac Sonography or Vascular Sonography only

### Magnetic Resonance Imaging

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# Semester III

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# Medical Dosimetry

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*Students coming from Radiation Therapy only.

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# Nuclear Medicine

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### Radiation Therapy

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**TOTAL** 14

**TOTAL** 49
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**TOTAL** 14

### Vascular Sonography

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**TOTAL** 19
Semester III
RSV 423  Clinical Vascular III  8
RSV 482  Vascular Review Seminar  2

TOTAL  10

NON-IMAGING CURRICULUM

Education

Semester I  Course  Credits
CMST 201  Technology Applications for Healthcare  3
COMM 101*  Interpersonal Communication*  *3
COMM 201*  Intercultural Communication*  *3
ED 301  Methods of Teaching  3
PSYC 301  Educational Psychology  3

TOTAL  12

Semester II
ED 307  Concepts and Techniques in Assessment  3
ED 401  Technology and Instruction  3
ED 409  Curriculum Design and Evaluation  3
ID 302  Understanding Research Principles and the Scientific Method  3

TOTAL  12

Semester III
ID 303  Advanced Research Project Analysis  3

TOTAL  3

* Student’s choice of two alternative courses.

Healthcare Information Systems

Semester I  Course  Credits
CMST 212  Data Base Management  3
HCA 300  Health Services Delivery and Organization  3
HMIS 310  Management Information Systems in Healthcare  3
HMIS 311  Informatics Resources and Technology for Health Services  3

TOTAL  12

Semester II
HMIS 401  Network Management  3
HMIS 402  Systems Design  3
HMIS 420  Informatics Analysis and Utilization in Health Services  3
ID 302  Understanding Research Principles and the Scientific Method  3

TOTAL  12

Semester III
ID 303  Advanced Research Project Analysis  3

TOTAL  3

TOTAL  27
Health Management

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<td>HCA 300</td>
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TOTAL                                               27

All Non-Imaging courses are taught by the Department of Professional and Continuing Studies. Course descriptions of these courses can be found in the Professional and Continuing Studies section of the JCHP Course Catalog.

MASTER OF SCIENCE IN RADIOLOGIC AND IMAGING SCIENCES
The Department of Radiologic Sciences offers five Master of Science (MS) tracks:
- Education
- Management
- Computed Tomography (CT)
- PET/CT
- Invasive Cardiovascular Technology (ICVT)

Students earn a Master of Science Degree in Radiologic and Imaging Sciences upon completion of the program. The program is offered full-time (one-year, executive-style) or part-time (two-year) and begins in the fall.

Students completing the CT track may be eligible for the ARRT(CT) certification exam.

Students completing the PET/CT track may be eligible for the ARRT(CT), NMTCB(CT) and/or NMTCB(PET) certification examinations.

Students completing the ICVT track may be eligible for the ARRT(CI) and/or CCI certification examinations.
1+1 BS/MS
Students who have 50 prerequisite credits and a bachelor's degree, or 50 prerequisite credits and certification in an allied health profession and/or have graduated from an accredited program in radiologic sciences or allied health may enter the one-year program, resulting in a Bachelor of Science degree in Radiologic Sciences. After earning the BS, students transition into the MS program, on a full-time (one-year, executive-style) or part-time (two-year) basis, earning a Master of Science in Radiologic and Imaging Sciences.

2+1 BS/MS
Students who have 50 prerequisite credits but do not have a bachelor's degree or an education in the radiologic sciences or a health discipline may enter the two-year program, training in a combination of concentrations, and resulting in a Bachelor of Science degree in Radiologic Sciences.

After earning the BS, students transition into the MS program, on a full-time (one-year, executive-style) or part-time (two-year) basis, earning a Master of Science in Radiologic and Imaging Sciences.

MASTER OF SCIENCE IN RADIOLOGIC AND IMAGING SCIENCES CURRICULUM

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|                                            | RS 530     |         |
|                                            | Radiologic and Imaging Sciences | 2       |
|                                            | RS 560     |         |
|                                            | Program Accreditation | 3       |
|                                            | RS 610     |         |
|                                            | Advances in Current Technology I | 2       |
|                                            | RS 630     |         |
|                                            | Faculty Development | 3       |
|                                            | RS 650     |         |
|                                            | Healthcare Law and Ethics | 3       |
|                                            | RS691      |         |
|                                            | Capstone Project II | 1       |
|                                            |            | **14**  |

| Semester III                               |            |         |
|                                            | RS 620     |         |
|                                            | Advances in Current Technology II | 2       |
|                                            | RS 660     |         |
|                                            | Seminar | 2       |
|                                            | RS 692     |         |
|                                            | Capstone Project III | 1       |
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| TOTAL       |                                      | **30**  |

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TOTAL

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<td><strong>Courses for cardiac/vascular sonographers only</strong></td>
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Descriptions for courses listed above are in the section entitled “Radiologic Sciences Course Descriptions.”

UNDERGRADUATE CERTIFICATE PROGRAMS
Online or On Campus
The Department of Radiologic Sciences offers two certificate programs:
- CT
- PET/CT
CT CERTIFICATE PROGRAM
This part-time, one-year, online or on campus program is designed for certified radiographers, radiation therapists or nuclear medicine technologists to expand their education in computed tomography (CT). After completion of this program, students may be eligible to take the ARRT(CT) certification examination.

NOTE: International students may not be eligible for the online certificate as they may only take 1 online course per semester.

Prerequisites
Current ARRT(R), (T), (N) or CNMT certification or eligibility.

Curriculum

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TOTAL 13

Descriptions for courses listed above are in the section entitled “Radiologic Sciences Course Descriptions.”

PET/CT CERTIFICATE PROGRAM
This part-time, one-year, online or on campus program is designed for certified nuclear medicine technologists to expand their education in positron emission tomography (PET) and computed tomography (CT). After completion of this program, students may be eligible to take the ARRT(CT) or NMTCB(CT) certification examinations and/or the NMTCB(PET) certification examination.

NOTE: International students may not be eligible for the online certificate as they may only take 1 online course per semester.

Prerequisites
Current ARRT(N) and/or CNMT certification or eligibility.
### Curriculum

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| TOTAL       |                                | 15      |

Descriptions for courses listed above are in the section entitled “Radiologic Sciences Course Descriptions.”

### CLINICAL AFFILIATE SITES

JCHP Radiologic Sciences students gain first-hand experience with the latest imaging technologies and participate in clinical rotations at various affiliate hospitals, clinics and private offices located primarily within, but not limited to, eastern PA, northern DE and southern NJ. The Department has established agreements with a variety of clinical education centers to maximize student exposure to multiple settings and to provide experience in applying Radiologic Sciences techniques. Students are responsible for providing their own transportation to and from clinical facilities. Specific details covering clinical placement are available in the programmatic Academic Policies and Clinical Education Handbooks, distributed by the Department of Radiologic Sciences.

Due to the limited number of clinical sites, should a student be asked to leave the assigned clinical site for any reason, the Department cannot guarantee the student a new clinical placement. This would result in a failure for clinical and dismissal from the program/department.
DEPARTMENT OF RADIOLOGIC SCIENCES FACULTY

Frances H. Gilman, DHSc, RT(R)(CT)(MR)(CV)
   Department Chair and Associate Professor
   Program Director, Radiography and Invasive Cardio-vascular Technology
   Director, Executive Masters in Radiologic & Imaging Sciences

Richard H. Weening, PhD, RT(R)(MR)(CT), FAEIRS
   Professor, Program Director, Magnetic Resonance Imaging/Computed Tomography

Nandkumar M. Rawool, MD, RDMS
   Associate Professor, Program Director, Diagnostic Medical Sonography and Cardiovascular Sonography

Christina A. Truluck, PhD, RT(N), CNMT
   Associate Professor, Program Director and Clinical Coordinator, Nuclear Medicine and PET/CT

Traci Fox, EdD, RT(R), RVT, RDMS
   Assistant Professor, Clinical Coordinator, General Sonography and Vascular Sonography
   Research Assistant Professor of Radiology, Sidney Kimmel Medical College

Rimmon Greenidge, MS, RT (R)(MR)
   Assistant Professor, Clinical Coordinator, Magnetic Resonance Imaging, Clinical Instructor, Radiography

Maureen McDonald, MBA, RDMS, RDCS
   Assistant Professor, Clinical Coordinator, Cardiovascular Sonography

Colleen, Dempsey, MS, RT(R)
   Instructor, Radiography

Laura Eckert, BS, RT(R)(T)
   Instructor, Radiation Therapy

Shirley Johnston, MS, CMD, RT(R)(T)
   Instructor, Program Director and Clinical Coordinator, Medical Dosimetry

Matthew Marquess, MBA, RT(T)
   Instructor, Program Director, Radiation Therapy

Joan A. Zacharko, MS, RT(R)(CT)(M)
   Instructor, Clinical Coordinator, Radiography

Andrew Wu, PhD, DABR, DABMP, FAAPM
   Clinical Professor, Medical Dosimetry

Jimm Grimm, PhD, DABR, FAAPM
   Adjunct Professor, Medical Dosimetry

TianyouXue, PhD
   Clinical Assistant Professor, Medical Dosimetry

Scott Barnes, AAS, CMD, RT(R)(T)
   Clinical Instructor, Medical Dosimetry

Raymond Geiser, BS, RVT, RDMS
   Clinical Instructor, Vascular Sonography

Amy Harrison, MS, CMD
   Clinical Instructor, Medical Dosimetry

John Keklak, MS, CHP
   Clinical Instructor, Nuclear Medicine and Radiography, Radiation Safety Officer TJU/TJUH
Richard Merschen, MS, RT(R)(CV)
    Adjunct Assistant Professor, Invasive Cardiovascular Technology

Peter M. Natale, MS, RT(R)(MR)
    Clinical Instructor, CT/MRI; Technical Manager, Department of Radiology, TJUH

DEPARTMENT OF RADIOLOGIC SCIENCES MEDICAL DIRECTORS

Charles M. Intenzo, MD
    Medical Director, Nuclear Medicine Program
    Director, Division of Nuclear Medicine, Department of Radiology, TJUH
    Professor, Jefferson University Physicians

Gregary D. Marhefka, MD
    Medical Director, Cardiac Sonography Program
    Associate Director, Coronary Care Unit, Division of Cardiology, TJUH
    Assistant Professor, Jefferson University Physicians

Donald G. Mitchell, MD
    Medical Director, Magnetic Resonance Imaging Program
    Director, Division of Magnetic Resonance Imaging, Department of Radiology, TJUH
    Professor, Jefferson University Physicians

Laurence Needleman, MD
    Medical Director, General Sonography and Vascular Sonography Programs
    Director, Body CT/Abdominal Imaging; Co-Director, Vascular Center, TJUH
    Associate Professor, Jefferson University Physicians

Vijay M. Rao, MD
    Medical Director, Radiography Program
    Chair, Department of Radiology, TJUH
    Professor, Department of Radiology, TJUH

DEPARTMENT OF RADIOLOGIC SCIENCES STAFF

Rita Giunta, Administrative Assistant to the Chair
Maria Hayes, Education Coordinator

DEPARTMENT OF RADIOLOGIC SCIENCE CONTACT INFORMATION

Thomas Jefferson University
College of Health Professions
Department of Radiologic Sciences
901 Walnut Street, 7th Floor
Philadelphia, PA 19107
RADIOLOGIC SCIENCES COURSE DESCRIPTIONS
Courses are described in numerical order within programs. The number within parentheses following
the course title indicates the number of semester credits assigned to each course. Courses listed in the
curriculum with prefixes other than Radiologic Sciences are located in the Professional and Continuing
Studies section of this Catalog.

Cardiac Sonography Courses
RADIOLOGIC SCIENCES CS302
Noninvasive Testing Principles and Procedures (2)
Provides a foundation in the basic principles of electrocardiography. Presents an overview of the theory
and diagnostic techniques utilized by technologists in noninvasive laboratory. Emphasizes the
development of a systematic approach to electrocardiographic interpretation, dysrhythmia analysis,
exercise stress testing, Holter monitoring, nuclear medicine procedures, phonocardiography and
pacemaker evaluation.

RADIOLOGIC SCIENCES CS 311
Cardiovascular Physiology (2)
Presents the construction and dynamics of the cardiovascular system in detail. Includes the
development of the cardiovascular system, anatomical and physiological characteristics, heart sounds,
biophysics of the cardiac cell, cardiac pumping action and its regulation, cardiovascular hemodynamics,
coronary blood flow, systemic and pulmonic circulation and the control of regional circulation.

RADIOLOGIC SCIENCES CS 312
Cardiovascular Pathophysiology (2)
Continuation of Radiologic Sciences CS 311, Cardiovascular Physiology. Provides an examination of the
structure and function of the cardiovascular system in health and disease. Emphasizes the
pathophysiological mechanisms of acquired and congenital cardiovascular diseases as well as their
clinical presentation, detection, treatment and pharmacological effects on the heart.
Prerequisite: Radiologic Sciences CS 311

RADIOLOGIC SCIENCES CS 321
Patient Care & Services in Medical Imaging & Radiation Oncology (2)
Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences
modalities. Emphasizes patient care, professional ethics and medicolegal issues.

RADIOLOGIC SCIENCES CS 331
Cardiac Procedures I (2)
Lecture presentation and hands-on operation of the fundamental equipment utilized in an
echocardiographic laboratory. Emphasizes the clinical application, operation, knobology and
instrumentation associated with such equipment. Provides guided practice in the performance of
standard echocardiographic procedures in a laboratory setting. Topics include two-dimensional imaging,
M-mode obtainment and measurement, and wall-motion abnormalities as well as pulsed-wave,
continuous-wave and color Doppler techniques.
RADIOLOGIC SCIENCES CS 332
Cardiac Procedures II (2)
Continuation of Radiologic Sciences CS 331, Cardiac Procedures I.
Prerequisite: Radiologic Sciences CS 331

RADIOLOGIC SCIENCES CS 351
Cardiac Principles I (3)
Provides a comprehensive introduction to the fundamental skills and principles needed to perform echocardiography. Presents cardiac anatomy, physiology and pathophysiology. Topics include two-dimensional imaging, M-mode and Doppler techniques with emphasis upon the physical principles and cross-sectional anatomy common to each of the above specialty procedures. Students utilize these fundamentals to evaluate selected cardiovascular disease states.

RADIOLOGIC SCIENCES CS 352
Cardiac Principles II (3)
Continuation of Radiologic Sciences CS 351, Cardiac Principles I. Emphasizes advanced procedures and specialty applications in acquired and congenital cardiovascular disease states.
Prerequisite: Radiologic Sciences CS 351

RADIOLOGIC SCIENCES CS 400
Ultrasound Physics I (2)
Presents general acoustic principles including sound wave parameters, energy transfer through wave propagation, pulsed and continuous wave generation and parameters, surface reflection processes, and transducer construction. Discusses beam profile consideration and an introduction to A-mode, B-mode, and M-mode. Emphasizes applied principles of physics, knobology, and instrumentation relative to ultrasound.

RADIOLOGIC SCIENCES CS 403
Ultrasound Physics II (2)
Continues discussion of properties of sound and presents advanced concepts including computer technology and the instrumentation used to create and store the ultrasound image, and introduction to fluid dynamics, spectral, color and amplitude Doppler. Emphasizes advanced principles of physics, knobology, acoustical artifacts, bioeffects/safety and quality assurance relative to ultrasound.
Prerequisite: Radiologic Sciences CS 400

RADIOLOGIC SCIENCES CS 411
Clinical Cardiac I (6)
Observing and applying clinical principles in an echocardiography laboratory. Emphasizes professional attributes and fundamental clinical skills necessary to perform and interpret transthoracic echocardiography. Students synthesize learning from the didactic, laboratory and instrumentation courses.

RADIOLOGIC SCIENCES CS 412
Clinical Cardiac II (6)
Continuation of Radiologic Sciences CS 411, Clinical Cardiac I. Prerequisite: Radiologic Sciences CS 411
RADIOLOGIC SCIENCES CS 413
Clinical Cardiac III (8)
Continuation of Radiologic Sciences CS 412, Clinical Cardiac II, with active participation in an echocardiography laboratory. Emphasizes the clinical skills necessary to perform advanced techniques and specialty applications in acquired and congenital disease states. Presents the opportunity to work more independently in the performance of standard echocardiographic procedures.
Prerequisite: Radiologic Sciences CS 412

RADIOLOGIC SCIENCES CS 481
Cardiac Review Seminar (2)
Presents a comprehensive review of the physical principles, instrumentation and clinical applications of echocardiography in preparation for the registry examination.

RADIOLOGIC SCIENCES CS xxx
Special Topics in Cardiac Sonography I (1)
Presents new techniques and information, clinical experiences and presentation of case studies in a weekly seminar format.

RADIOLOGIC SCIENCES CS xxx
Special Topics in Cardiac Sonography II (1)
Continuation of topics in new techniques and information, clinical experiences and presentation of case studies in a weekly seminar format.

Computed Tomography Courses
RADIOLOGIC SCIENCES C 400
CT Physics and Instrumentation (3)
In-depth study of the physical principles and instrumentation in computed tomography. Covers the production of x-rays and their interactions with matter. Provides information on data acquisition and image reconstruction, processing and quality. Addresses CT scanner components and operation, scanning factors and their applications.

RADIOLOGIC SCIENCES C 401
Cross-Sectional Anatomy I (2)
The study of human anatomy as seen in axial, sagittal and coronal planes. Presents correlations to cadaver slides as well as CT and MR images. Anatomical regions studied include the central nervous system, neck and musculoskeletal system.

RADIOLOGIC SCIENCES C 402
Cross-Sectional Anatomy II (2)
Continuation of Radiologic Sciences C 401, Cross-Sectional Anatomy I. Anatomical regions studied include the thorax, abdomen and pelvis.
Prerequisite: Radiologic Sciences C 401
RADIOLOGIC SCIENCES C 412
Clinical CT I (6)
Students participate in the diagnostic process of performing CT imaging examinations at clinical sites. Students image anatomic structures and pathology and record the information needed to provide optimal examinations. Provides intensive, hands-on practice under the supervision of the clinical staff. Evaluation is based on clinical competency in all aspects of CT imaging procedures and patient care.

RADIOLOGIC SCIENCES C 413
Clinical CT II (6)
Continuation of Radiologic Sciences C 412, Clinical CT I.
Prerequisite: Radiologic Sciences C 412

RADIOLOGIC SCIENCES C 414
Clinical CT III (8)
Continuation of Radiologic Sciences C 413, Clinical CT II.
Prerequisite: Radiologic Sciences C 413

RADIOLOGIC SCIENCES C 431
CT Procedures I (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the central nervous system, neck musculoskeletal system, abdomen and pelvis. Discusses conventional, helical and multi-sliced methods.

RADIOLOGIC SCIENCES C 432
CT Procedures II (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the musculoskeletal system, thorax, interventional and special procedures. Discusses conventional, helical and multi-sliced methods.
Prerequisite: Radiologic Sciences C 431

RADIOLOGIC SCIENCES C 451
Imaging Informatics (2)
Introduces the use of digital electronics and computer technology in medical imaging. Topics include digital image acquisition, reconstruction, and post-processing, advanced visualization, decision support, computer networking and PACS, information systems, and industry standards such as DICOM, HL7, and IHE.

RADIOLOGIC SCIENCES C 473
CT Review Seminar (2)
A review seminar in preparation for the Computed Tomography certification examination.

RADIOLOGIC SCIENCES C 498
CT Special Topics (1)
A research project/special topics course taught in an independent study/seminar manner. Computed tomography students present research projects on CT topics agreed to by the instructor.
General Sonography Courses

RADIOLOGIC SCIENCES S 321
Patient Care & Services in Medical Imaging & Radiation Oncology (2)
Present basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.

RADIOLOGIC SCIENCES S 400
Ultrasound Physics I (2)
Present general acoustic principles including sound wave parameters, energy transfer through wave propagation, pulsed and continuous wave generation and parameters, surface reflection processes, and transducer construction. Discusses beam profile consideration and an introduction to A-mode, B-mode, and M-mode. Emphasizes applied principles of physics, knobology, and instrumentation relative to ultrasound.

RADIOLOGIC SCIENCES S 401
Sonography Cross-Sectional Anatomy (2)
Introduces gross anatomic structures and abnormalities of cranial, neck, thoracic, abdominal and pelvic regions relative to diagnostic ultrasound. Presents correlations to cadaver slides as well as CT and MRI images.

RADIOLOGIC SCIENCES S 402
Abdominal Sonography I (2)
Present normal abdominal anatomy, physiology, related vasculature, scanning techniques and protocols regarding the abdominal sonographic examination.

RADIOLOGIC SCIENCES S 403
Ultrasound Physics II (2)
Continue discussion of properties of sound and presents advanced concepts including computer technology and the instrumentation used to create and store the ultrasound image, and introduction to fluid dynamics, spectral, color and amplitude Doppler. Emphasizes advanced principles of physics, knobology, acoustical artifacts, bioeffects/safety and quality assurance relative to ultrasound. Prerequisite: Radiologic Sciences S 400

RADIOLOGIC SCIENCES S 404
Pelvic Sonography (3)
Present female pelvic anatomy, physiology, pathophysiology, related vasculature, scanning techniques and protocols regarding the pelvic sonographic examination. Reviews the anatomy and physiology of reproduction. Presents normal and abnormal first trimester sonography.

RADIOLOGIC SCIENCES S 405
Obstetrical Sonography (3)
Present obstetrical applications of diagnostic ultrasound. Reviews the anatomy and physiology of fetal development. Presents normal and abnormal second and third trimester sonography. Emphasizes obstetrical measurements and fetal dynamics.

RADIOLOGIC SCIENCES S 408
Sonography Review Seminar (2)
Presents a comprehensive review of physics, abdominal, pelvic, obstetrical and high resolution imaging applications of general sonography in preparation for the diagnostic medical sonography national registry examinations.

RADIOLOGIC SCIENCES S 412
Clinical Sonography I (6)
Students perform sonographic procedures during clinical rotations at affiliate sites under the supervision of designated clinical instructors. Evaluation of cognitive, effective and psychomotor skills is based on competency in scanning protocols and techniques, professionalism and proficiency in patient care.

RADIOLOGIC SCIENCES S 413
Clinical Sonography II (6)
Continuation of Radiologic Sciences S 412, Clinical Sonography I. Provides supervised clinical practice of diagnostic medical sonography in a university laboratory and clinical setting. Students are responsible for imaging and recording anatomic structures and pathology needed to perform optimal examinations. Requires intensive, hands-on clinical practice.
Prerequisite: Radiologic Sciences S 412

RADIOLOGIC SCIENCES S 414
Clinical Sonography III (8)
Continuation of Radiologic Sciences S 413, Clinical Sonography II.
Prerequisite: Radiologic Sciences S 413

RADIOLOGIC SCIENCES S 415
Sonography Procedures I (2)
Presents, demonstrates and guides hands-on practice on equipment utilized in a general sonography laboratory to evaluate general sonography anatomy. Emphasizes the clinical application, operation, knobology, applied ultrasound physics, and instrumentation associated with such equipment combined with two-dimensional imaging of abdomino-pelvic organs, regions and related vasculature.

RADIOLOGIC SCIENCES S 416
High Resolution Sonography (2)
Presents the latest techniques in high frequency ultrasound imaging, including breast, neurosonology, thyroid and male pelvic examinations. Includes anatomy, physiology, pathophysiology and related vasculature regarding these sonographic scans.

RADIOLOGIC SCIENCES S 417
Sonography Procedures II (2)
Provides guided practice in the performance of standard abdominal, pelvic, obstetric and high-resolution sonography procedures. Topics include detailed knobology, applied ultrasound physics, two-dimensional imaging, caveats, pitfalls and artifacts.
Prerequisite: Radiologic Sciences S 415
RADIOLOGIC SCIENCES S 422
Abdominal Sonography II (2)
Presents pathophysiology, related vasculature, scanning techniques and protocols regarding the abdominal sonographic examination.
Prerequisite: Radiologic Sciences S 402

RADIOLOGIC SCIENCES S 498
Special Topics in General Sonography (2)
Presents new techniques and information, clinical experiences and presentation of case studies in a weekly seminar format. Includes an overview of sonographic contrast agents, pediatric hips, three- and four-dimensional sonography, and new advances in ultrasound technology.

Invasive Cardiovascular Technology Courses
RADIOLOGIC SCIENCES I 302
Noninvasive Testing Principles and Procedures (2)
Provides a foundation in the basic principles of electrocardiography. Presents an overview of the theory and diagnostic techniques utilized by technologists in noninvasive laboratory. Emphasizes the development of a systematic approach to electrocardiographic interpretation, dysrhythmia analysis, exercise stress testing, Holter monitoring, nuclear medicine procedures, phonocardiography and pacemaker evaluation.

RADIOLOGIC SCIENCES I 311
Cardiovascular Physiology (2)
Presents the construction and dynamics of the cardiovascular system in detail. Includes the development of the cardiovascular system, anatomical and physiological characteristics, heart sounds, biophysics of the cardiac cell, cardiac pumping action and its regulation, cardiovascular hemodynamics, coronary blood flow, systemic and pulmonic circulation and the control of regional circulation.

RADIOLOGIC SCIENCES I 312
Cardiovascular Pathophysiology (2)
Continuation of Radiologic Sciences I 311, Cardiovascular Physiology. Provides a physiologic and technical back-ground for the various diagnostic and therapeutic techniques in the field. Emphasizes the pathophysiological mechanisms of acquired and congenital cardiovascular diseases as well as their clinical presentation, detection and treatment.
Prerequisite: Radiologic Sciences I 311

RADIOLOGIC SCIENCES I 313
Radiobiology and Health Physics (2)
Presents the principles of cell biology and effects of ionizing radiation at the molecular, cellular and systemic levels. Emphasis is on changes at the cellular level and stochastic vs. deterministic effects and the concept of risk estimates. Covers principles and practice of radiation safety in radiology, including pertinent rules and regulations.
RADIOLOGIC SCIENCES I 338
Invasive Procedures I (3)
Provides guided practice in the performance of procedures utilized in diagnostic invasive cardiovascular procedures. Includes sterile technique, circulating and monitoring procedures, pharmacologic identification, room set-up and film processing.

RADIOLOGIC SCIENCES I 339
Invasive Procedures II (3)
Continuation of Radiologic Sciences I 338, Invasive Procedures I. Provides guided practice in the performance of advanced invasive cardiovascular procedures in a laboratory setting. Emphasizes the clinical application and operation of equipment utilized in interventional and electro-physiologic studies. Prerequisite: Radiologic Sciences I 338

RADIOLOGIC SCIENCES I 341
Radiography Physics and Instrumentation I (2)
Presents the physical principles underlying radiological technology, focusing on the equipment required to generate x-rays and on the nature and behavior of x-radiation. Includes basic math review, radiation units, mechanics, atomic physics, electricity and magnetism, electromagnetic waves, x-ray generator circuits, x-ray tubes and x-ray interactions with matter.

RADIOLOGIC SCIENCES I 342
Radiography Physics and Instrumentation II (2)
Continuation of Radiologic Sciences I 341, Radiography Physics and Instrumentation I. Introduces concepts of radiographic image quality and describes specialized radiographic equipment. Includes x-ray detection, radiographic contrast, radiographic noise (mottle), x-ray scatter, spatial resolution, geometric effects of projection, tomography (conventional and CT), fluoroscopy, automatic exposure control, conventional and computed radiography, image display and computer hardware and software. Prerequisite: Radiologic Sciences I 341

RADIOLOGIC SCIENCES I 357
Invasive Principles I (3)
Provides a comprehensive introduction to the fundamental skills and principles needed to perform diagnostic cardiac procedures. Emphasizes indications and contraindications and the collection of diagnostic information obtained during the procedure. Students utilize these fundamentals to evaluate acquired cardiovascular disease states.

RADIOLOGIC SCIENCES I 358
Invasive Principles II (3)
Continuation of Radiologic Sciences I 357, Invasive Principles I. Emphasizes emergency and interventional techniques, electrophysiology studies and specialty applications in congenital and acquired disease states. Prerequisite: Radiologic Sciences I 357
RADIOLOGIC SCIENCES I 431
Clinical Invasive I (6)
Requires observation and application of clinical principles in an invasive cardiovascular laboratory. Emphasizes the professional attributes and fundamental technical skills necessary to perform as a team member during invasive procedures. Students synthesize learning from the didactic, laboratory and instrumentation courses. Students must demonstrate competency in the performance of ICVT procedures.

RADIOLOGIC SCIENCES I 432
Clinical Invasive II (6)
Continuation of Radiologic Sciences I 431, Clinical Invasive I. Students continue application of ICVT skills. Students must demonstrate competency in the performance of ICVT procedures.
Prerequisite: Radiologic Sciences I 431

RADIOLOGIC SCIENCES I 433
Clinical Invasive III (8)
Continuation of Radiologic Sciences I 432, Clinical Invasive II with active participation in an invasive cardiovascular laboratory. Emphasizes the professional attributes and technical skills necessary to perform as a team member during interventional techniques, electrophysiology studies and specialty applications in congenital and acquired disease states. Presents the opportunity to work more independently in the performance of invasive cardiovascular procedures. Students accept more responsibility for simple procedures and begin to perform more complex procedures under supervision.
Prerequisite: Radiologic Sciences I 432

RADIOLOGIC SCIENCES I 483
Invasive Review Seminar (2)
Presents a comprehensive review of the physical principles, instrumentation and clinical applications of invasive cardiac procedures in preparation for the registry examination.

Magnetic Resonance Imaging Courses
RADIOLOGIC SCIENCES M 321
Patient Care & Services in Medical Imaging & Radiation Oncology (2)
Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.

RADIOLOGIC SCIENCES M 400
MRI Physics and Instrumentation I (3)
In-depth study of the physical principles and instrumentation in MRI. Includes fundamentals of atomic physics, pulse sequencing, imaging parameters, relaxation times and their effects on the MRI signal. Provides an overview of the MRI hardware.

RADIOLOGIC SCIENCES M 401
Cross-Sectional Anatomy I (2)
The study of human anatomy as seen in axial, sagittal and coronal planes. Presents correlations with CT and MR images. Anatomical regions studied include the central nervous system, neck and
musculoskeletal system.

**RADIOLOGIC SCIENCES M 402**  
**Cross-Sectional Anatomy II (2)**  
Continuation of Radiologic Sciences M 401, Cross-Sectional Anatomy I. Anatomical regions studied include the thorax, abdomen and pelvis.  
Prerequisite: Radiologic Sciences M 401

**RADIOLOGIC SCIENCES M 403**  
**MRI Physics and Instrumentation II (1)**  
Continuation of Radiologic Sciences M 400. Includes MRI artifacts and an introduction to magnetic resonance angiography and methods.  
Prerequisite: Radiologic Sciences M 400

**RADIOLOGIC SCIENCES M 411**  
**MRI Safety (2)**  
Comprehensive overview of issues related to MRI safety. Includes practical guidelines and recommendations that assist in the management of patients in the MRI environment.

**RADIOLOGIC SCIENCES M 412**  
**Clinical MRI I (6)**  
Students participate in the diagnostic process of performing MRI imaging examinations at clinical sites. Requires imaging anatomic structures and pathology and recording the information needed to provide optimal examinations. Provides intensive, hands-on clinical practice under the supervision of the clinical staff. Evaluation is based on clinical competency in all aspects of MRI imaging procedures and patient care.  
Corequisite: Radiologic Sciences M 411

**RADIOLOGIC SCIENCES M 413**  
**Clinical MRI II (6)**  
Continuation of Radiologic Sciences M 412, Clinical MRI I.  
Prerequisite: Radiologic Sciences M 412

**RADIOLOGIC SCIENCES M 414**  
**Clinical MRI III (8)**  
Continuation of Radiologic Sciences M 413, Clinical MRI II.  
Prerequisite: Radiologic Sciences M 413

**RADIOLOGIC SCIENCES M 415**  
**MRI Pathology (1)**  
The study of human pathology as seen in axial, sagittal and coronal planes. Presents correlations with CT and MR images. Anatomic regions studied include the central nervous system, neck, musculoskeletal system, thorax, abdomen and pelvis.
RADIOLOGIC SCIENCES M 431
MRI Procedures I (2)
Covers the various MRI protocols utilized to produce anatomy and pathology on the MR image specific to the central nervous system, neck and musculoskeletal system.

RADIOLOGIC SCIENCES M 432
MRI Procedures II (2)
Covers the various MRI protocols utilized to produce anatomy and pathology on the MR image specific to the thorax, abdomen and pelvis. Prerequisite: Radiologic Sciences M 431

RADIOLOGIC SCIENCES M 451
Imaging Informatics (2)
Introduces the use of digital electronics and computer technology in medical imaging. Topics include digital image acquisition, reconstruction, and post-processing, advanced visualization, decision support, computer networking and PACS, information systems, and industry standards such as DICOM, HL7, and IHE.

RADIOLOGIC SCIENCES M 473
MRI Seminar (2)
A review seminar in preparation for the magnetic resonance imaging certification examination.

RADIOLOGIC SCIENCES M 499
Magnetic Resonance Imaging Independent Study (1-4)
Capstone course conducted under the direction of departmental faculty. Primary focus is on either the final preparation for the magnetic resonance imaging certification examination or review of journal articles and the submission of research papers and/or posters relevant to clinical practice, professional issues or advances in the field.

Medical Dosimetry Courses
RADIOLOGIC SCIENCES D 321
Patient Care & Services in Medical Imaging & Radiation Oncology (2)
Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.

RADIOLOGIC SCIENCES D 401
Cross-Sectional Anatomy I (2)
The study of human anatomy as seen in axial, sagittal and coronal planes. Presents correlations to cadaver slides as well as CT and MR images. Anatomical regions studied include the central nervous system, neck and thorax.

RADIOLOGIC SCIENCES D 402
Cross-Sectional Anatomy II (2)
Continuation of Radiologic Sciences D 401, Cross-Sectional Anatomy I. Anatomical regions studied include the musculo-skeletal system, abdomen and pelvis. Prerequisite: Radiologic Sciences D 401
RADIOLOGIC SCIENCES D 412
Clinical Medical Dosimetry I (6)
Provides the opportunity to work with the clinical personnel in a team approach to radiation therapy treatment, planning and patient care. Includes clinical experience such as dose calculations and treatment planning, radiation safety, quality assurance and annual calibrations of equipment with a physicist.

RADIOLOGIC SCIENCES D 413
Clinical Medical Dosimetry II (6)
Continuation of Radiologic Sciences D 413, Clinical Medical Dosimetry I.
Prerequisite: Radiologic Sciences D 412

RADIOLOGIC SCIENCES D 414
Clinical Medical Dosimetry III (8)
Continuation of Radiologic Sciences D 413, Clinical Medical Dosimetry II.
Prerequisite: Radiologic Sciences D 413

RADIOLOGIC SCIENCES D 415
Clinical Radiation Oncology (2)
Presents the topics of epidemiology, etiology, prognosis, methods of treatment and adjuvant therapies for each anatomic area.

RADIOLOGIC SCIENCES D 430
Case Studies in Dosimetry (1)
The students follow a breast cancer patient throughout the entire process of receiving radiation treatments. The student’s involvement in the patient’s care will be initiated at the time of simulation and extend through the post treatment follow up physician visits.

RADIOLOGIC SCIENCES D 435
Medical Dosimetry Physics I (3)
Presents the basic physical principles of radiologic and nuclear science and technology, focusing on the generation of ionizing radiation, atomic and nuclear transformations, the characteristics of radiation, and interactions of radiations with matter. Includes a description of radiation producing machines, a definition of dosimetry, measurement of dosimetry, models of dosimetry calculations, basic principles of treatment, planning, clinical applications of dosimetry and treatment planning of treatment of human diseases.

RADIOLOGIC SCIENCES D 436
Medical Dosimetry Physics II (3)
Continuation of Radiologic Sciences D 435, Medical Dosimetry Physics I.
Prerequisite: Radiologic Sciences D 435

RADIOLOGIC SCIENCES D 439
Radiation Protection (1)
Presents basic principles of radiation protection and safety for the radiation therapist. Discusses
radiation safety requirements of federal and state regulatory agencies, accreditation agencies and healthcare organizations.

RADIOLOGIC SCIENCES D 440
Introduction to Radiobiology (2)
 Presents basic concepts, theories and principles of radiation biology. Discusses the physical properties of radiation and how radiation interacts with biological matter. Examines the effects of radiation on DNA, cells and individuals, as well as the concepts and practice of clinical radiation therapy.

RADIOLOGIC SCIENCES D 442
Quality Assurance and Instrumentation (2)
 Presents the basics physical principles of instrumentations of measuring radiation exposures and doses, and essential procedures of quality assurance of radiation producing machines, radioactive sources and treatment planning computers for therapeutic purposes.

RADIOLOGIC SCIENCES D 443
Brachytherapy (2)
 Introduces students to the properties of radioactive isotopes used in brachytherapy and basic clinical practices of brachytherapy.

RADIOLOGIC SCIENCES D 444
Special Procedures (2)
 Presents introduction and basic clinical procedures of high dose rate remote afterloader (HDR), stereotactic radiosurgery (SRS), linac-based stereotactic radiotherapy (SRT), three dimensional conformal radiotherapy (3DCRT), intensity modulated radiotherapy (IMRT) and image gilded radiotherapy (IGRT).

RADIOLOGIC SCIENCES D 480
Survey of Medical Imaging (2)
 Presents a comprehensive survey of the physical principles, technology concepts, equipment and procedures used in medical imaging.

Nuclear Medicine Courses

RADIOLOGIC SCIENCES N 321
Patient Care & Services in Medical Imaging & Radiation Oncology (2)
 Presents an introduction to basic medical techniques in patient care, safety, infection control, pharmacology, medico-legal issues, bioethics, health care delivery environments and an overview of the various imaging specialties in the Radiologic Sciences.

RADIOLOGIC SCIENCES N 400
Medical Nuclear Physics (3)
 Presents applicable concepts of mathematics and classical physics. Covers atomic structure, mass-energy relationships, electromagnetic radiation, quantum theory, decay modes, half-life, radionuclide production, interaction of radiation with matter and gamma spectroscopy.
RADIOLOGIC SCIENCES N 410
Medical Radiobiology (2)
Presents the basics of radiobiology including molecular and cellular effects of radiation, the acute and chronic effects of radiation and the processes by which radiation affects the various tissues and organ systems of the body. Covers stochastic and deterministic effects in detail.

RADIOLOGIC SCIENCES N 420
Radiation Protection (3)
Provides an overview of the external and internal radiation hazards inherent to working in a nuclear medicine clinic and presents the state and federal licensing requirements, guidelines and regulations for safe radiation practice. Lecture material includes: governing agencies, radiation signs, record keeping, dose calibrator, survey meters, personnel and area monitoring, radionuclide receipt, storage and disposal, and management of clinical radioactivity spills. Covers exposure, effective dose, decay calculations and information specific to radiopharmaceutical therapy.

RADIOLOGIC SCIENCES N 430
Nuclear Medicine Instrumentation (3)
Introduces nuclear medicine and radiation detection instrumentation. Includes gas-filled detectors and scintillation detectors. Covers design, operation and quality control of these instruments. Includes detailed discussions of the gamma camera system, its components, hardware and software. Includes tomographic imaging in SPECT and PET systems.

RADIOLOGIC SCIENCES N 451
Imaging Informatics (2)
Introduces the use of digital electronics and computer technology in medical imaging. Includes digital image acquisition, reconstruction, and post-processing, advanced visualization, decision support, computer networking and PACS, information systems, and industry standards such as DICOM, HL7, and IHE.

RADIOLOGIC SCIENCES N 455
Nuclear Medicine Procedures I (3)
Introduces the interrelated aspects of performing scintigraphic procedures. Includes anatomy and pathophysiology of the organ systems (skeletal, lymphatic, cardiovascular and central nervous systems), radiopharmaceuticals, patient preparation and care, imaging instrumentation and protocols. Presents and discusses representative images.

RADIOLOGIC SCIENCES N 456
Nuclear Medicine Procedures II (3)
Introduces the interrelated aspects of performing scintigraphic procedures. Includes anatomy and pathophysiology of the organ systems (pulmonary, genitourinary, gastrointestinal and endocrine systems), radiopharmaceuticals, patient preparation and care, imaging instrumentation and protocols. Presents and discusses representative images. Covers selected therapeutic procedures, including the properties and selection of radiopharmaceuticals and pertinent radiation safety techniques. Prerequisite: Radiologic Sciences N 455
RADIOLOGIC SCIENCES N 457
Nuclear Medicine Procedures III (2)
Introduces topics that encompass the interrelated aspects of performing scintigraphic procedures. Includes pathophysiology and imaging of tumors, inflammations and infections, non-imaging (in vitro) studies, radiotherapy, radioimmunotherapy, and positron emission tomography (PET). Includes radiopharmaceuticals, imaging and laboratory instrumentation and protocols. Presents and discusses representative images. Prerequisite: Radiologic Sciences N 456

RADIOLOGIC SCIENCES N 458
Nuclear Medicine Advanced Procedures (2)
Introduces some recent advances in the field of nuclear medicine: molecular imaging, positron emission tomography (PET) and hybrid imaging. Includes radiopharmaceuticals, cross-sectional anatomy, imaging physics and instrumentation, and protocols. Presents and discusses representative images.
Prerequisite: Radiologic Sciences N 457

RADIOLOGIC SCIENCES N 460
Radiochemistry and Radiopharmaceuticals (3)
Introduces the principles and applications of radiochemistry and radiopharmaceuticals. Includes radionuclide production, cyclotrons and generators, transient and secular equilibrium, radiopharmaceutical properties, radiopharmacologic mechanisms, radiopharmaceuticals preparation and quality control. Discusses common clinically used radiopharmaceuticals in detail. Introduces general pharmacology and pharmokinetics, and discusses interventional medications used in nuclear medicine. Laboratory practice focuses on operation and management of the hot-lab.

RADIOLOGIC SCIENCES N 470
Clinical Nuclear Medicine I (6)
Provides the opportunity to become competent in the skills necessary to perform high quality nuclear medicine procedures and provide excellent patient care. Clinical education is conducted at an assigned clinical affiliate site under the supervision of registered nuclear medicine technologists and other healthcare professionals. Provides intensive, hands-on clinical practice, leading to competency in all aspects of nuclear medicine imaging procedures and patient care.

RADIOLOGIC SCIENCES N 471
Clinical Nuclear Medicine II (6)
Continuation of Radiologic Sciences N 470, Clinical Nuclear Medicine I.
Prerequisite: Radiologic Sciences N 470

RADIOLOGIC SCIENCES N 472
Clinical Nuclear Medicine III (8)
Continuation of Radiologic Sciences N 471, Clinical Nuclear Medicine II.
Prerequisite: Radiologic Sciences N 471

RADIOLOGIC SCIENCES N 499
Nuclear Medicine Review Seminar (2)
Systematic review of all areas of study included in the nuclear medicine program, including, but not
limited to, nuclear medicine physics and instrumentation, medical radiobiology and radiation protection, radiochemistry and radio-pharmaceuticals, digital imaging, patient care, and nuclear medicine procedures. Emphasizes preparation of the student for ARRT and NMTCB examinations.

**Radiation Therapy Courses**

**RADIOLOGIC SCIENCES T 321**

**Patient Care & Services in Medical Imaging & Radiation Oncology (2)**

Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.

**RADIOLOGIC SCIENCES T 401**

**Cross-Sectional Anatomy I (2)**

The study of human anatomy as seen in axial, sagittal and coronal planes. Presents correlations to cadaver slides as well as CT and MR images. Anatomical regions studied include the central nervous system, neck and thorax.

**RADIOLOGIC SCIENCES T 402**

**Cross-Sectional Anatomy II (2)**

Continuation of Radiologic Sciences T 401, Cross-Sectional Anatomy I. Anatomical regions studied include the musculo-skeletal system, abdomen and pelvis. Prerequisite: Radiologic Sciences T 401

**RADIOLOGIC SCIENCES T 409**

**Radiation Therapy Principles and Procedures I (3)**

Provides an overview of cancer and the specialty of radiation therapy. Introduces the multidisciplinary approach to oncology and develops related topics including pathology, cancer growth tumor response, critical organs and reactions.

**RADIOLOGIC SCIENCES T 412**

**Clinical Radiation Therapy I (6)**

Provides development, application, analysis, integration and evaluation of concepts and theories in radiation therapy. Evaluates concepts of team practices, patient-centered clinical practice and professional development through structured sequential assignments at clinical facilities.

**RADIOLOGIC SCIENCES T 413**

**Clinical Radiation Therapy II (6)**

Continuation of RST 412 Clinical Radiation Therapy I. Prerequisite: Radiologic Sciences T 412

**RADIOLOGIC SCIENCES T 414**

**Clinical Radiation Therapy III (10)**

Continuation of RST 413 Clinical Radiation Therapy II. Prerequisite: Radiologic Sciences T 413
RADIOLOGIC SCIENCES T 415
Clinical Radiation Oncology (2)
Primates the topics of epidemiology, etiology, prognosis, methods of treatment and adjuvant therapies for each anatomic area.

RADIOLOGIC SCIENCES T 416
Principles of Radiation Dosimetry (2)
Primates factors that govern treatment planning of the patient. Includes topics such as isodose distribution, dosimetric calculations, compensation and clinical application of treatment beams. Emphasizes state-of-the-art treatment planning along with particle beams, stereotactic and intensity modulated radiation therapy and brachytherapy procedures.

RADIOLOGIC SCIENCES T 419
Radiation Therapy Principles and Procedures II (3)
Primates and evaluates epidemiology, etiology, detection, diagnosis, treatment and prognosis of neoplastic disease in relationship to histology, anatomical sites and patterns of spread. Discusses the radiation therapist’s role in the management of neoplastic disease and the skills required to analyze issues and make decisions in a professional manner.
Prerequisite: Radiologic Sciences T 409

RADIOLOGIC SCIENCES T 429
Radiation Therapy Principles and Procedures III (2)
Continuation of Radiation Therapy Principles and Procedures II.
Prerequisite: Radiologic Sciences T 419

RADIOLOGIC SCIENCES T 435
Radiation Therapy Physics I (2)
Introduces a basic knowledge of physics pertinent to developing an understanding of radiations used in the clinical setting. Presents the fundamentals of x-ray generating equipment, x-ray production and interaction with matter.

RADIOLOGIC SCIENCES T 436
Radiation Therapy Physics II (2)
Expands on concepts and theories related to structure of matter, properties of radiation, nuclear transformation and interactions of ionizing radiation. Discusses radiation therapy treatment units, measurement and quality of radiation produced, absorbed dose measurement and dose distribution.
Prerequisite: Radiologic Sciences T 435

RADIOLOGIC SCIENCES T 439
Radiation Protection (1)
Primates basic principles of radiation protection and safety for the radiation therapist. Discusses radiation safety requirements of federal and state regulatory agencies, accreditation agencies and healthcare organizations.
RADIOLOGIC SCIENCES T 440
**Introduction to Radiobiology (2)**
Presents basic concepts, theories and principles of radiation biology. Discusses the physical properties of radiation and how radiation interacts with biological matter. Examines the effects of radiation on DNA, cells and individuals, as well as the concepts and practice of clinical radiation therapy.

RADIOLOGIC SCIENCES T 473
**Radiation Therapy Review Seminar (2)**
Combines instruction and review of the radiation therapy curriculum for preparation of the radiation therapy board examination.

Radiography Courses
RADIOLOGIC SCIENCES R 313
**Radiobiology and Health Physics (2)**
Presents the principles of cell biology and effects of ionizing radiation at the molecular, cellular and systemic levels. Emphasizes changes at the cellular level and stochastic vs. deterministic effects and the concept of risk estimates. Covers principles and practice of radiation safety in radiology, including pertinent rules and regulations.

RADIOLOGIC SCIENCES R 321
**Patient Care and Services in Medical Imaging and Radiation Oncology (2)**
Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.

RADIOLOGIC SCIENCES R 331
**Radiographic Procedures I (2)**
Presents basic anatomy, terminology and radiographic positioning of the human body in examination of the chest, abdomen, upper extremity, lower extremity and spine.

RADIOLOGIC SCIENCES R 332
**Radiographic Procedures II (2)**
Presents basic anatomy, terminology and radiographic positioning of the human body in examination of the spine, skull and contrast procedures of the abdomen. Includes bony thorax.
Prerequisite: Radiologic Sciences R 331

RADIOLOGIC SCIENCES R 333
**Advanced Radiographic Procedures (1)**
Provides an overview of the various special procedures performed in radiology. Includes arthrography, venography, sialography, myelography, hysterosalphingography, vascular studies, interventional and non-interventional examinations. Discusses pediatric, geriatric and mobile radiography.
Prerequisite: Radiologic Sciences R 332

RADIOLOGIC SCIENCES R 341
**Radiography Physics and Instrumentation I (2)**
Presents the physical principles underlying radiologic technology, focusing on the equipment required to generate x-rays and on the nature and behavior of x-radiation. Includes basic math review, radiation units, mechanics, atomic physics, electricity and magnetism, electromagnetic waves, x-ray generator circuits, x-ray tubes and x-ray interactions with matter.

**RADIOLOGIC SCIENCES R 342**
Radiography Physics and Instrumentation II (2)
Continuation of Radiologic Sciences R341, Radiography Physics and Instrumentation I. Introduces concepts of radiographic image quality and describes specialized radiographic equipment. Includes x-ray detection, radiographic contrast, radiographic noise (mottle), x-ray scatter, spatial resolution, geometric effects of projection, tomography (conventional and CT), fluoroscopy, automatic exposure control, conventional and computed radiography, image display and computer hardware and software.
Prerequisite: Radiologic Sciences R 341

**RADIOLOGIC SCIENCES R 353**
Radiographic Imaging Principles I (2)
Designed to establish a knowledge base in factors that govern and influence the production and recording of radiologic images. Emphasizes the use of film and electronic imaging with related accessories. Uses class demonstrations/laboratories to demonstrate application of theory.

**RADIOLOGIC SCIENCES R 354**
Radiographic Imaging Principles II (2)
Continuation of Radiologic Sciences R 353, Radiographic Imaging Principles I. Includes image receptors, image processing and exposure conversion problems.
Prerequisite: Radiologic Sciences R 353

**RADIOLOGIC SCIENCES R 361**
Image Analysis I (2)
Provides a basis for analyzing radiographic images. Includes the importance of mini-mum imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality. Includes actual images of the chest, abdomen, upper and lower extremities for analysis.

**RADIOLOGIC SCIENCES R 362**
Image Analysis II (2)
Continuation of Radiologic Sciences R 361, Imaging Analysis I. Includes actual images of the spine, skull, thorax and contrast media studies for analysis.
Prerequisite: Radiologic Sciences R 361

**RADIOLOGIC SCIENCES R 371**
Clinical Radiography I (4)
Observing and applying healthcare principles. Students gradually begin application of radiographic positioning skills. Students must demonstrate competency in the performance of radiographic procedures.
RADIOLOGIC SCIENCES R 372
Clinical Radiography II (6)
Observing and applying healthcare principles. Students continue application of radiographic positioning skills. Students must demonstrate competency in the performance of radiographic procedures.
Prerequisite: Radiologic Sciences R 371

RADIOLOGIC SCIENCES R 373
Clinical Radiography III (8)
Observing and applying healthcare principles in radiology. Students accept more responsibility for simple procedures and begin to perform more complex procedures under supervision.
Prerequisite: Radiologic Sciences R 372

RADIOLOGIC SCIENCES R 412
Radiographic Pathology (2)
Examines the disease processes affecting all of the human systems. Emphasizes changes from the normal radiographic appearance as well as the effect of the various pathologies on the technical aspects of acquiring the radiograph and in-patient care. Covers medical terminology in detail as the pathologies affecting each human system are studied.

RADIOLOGIC SCIENCES R 471
Radiography Review Seminar (2)
Presents a comprehensive review with a lecture/testing format with retrospect of Radiologic Sciences in order to correlate and integrate the following topics: radiation protection, equipment operation and maintenance, image production and evaluation, radiographic procedures and patient care.

Vascular Sonography Courses
RADIOLOGIC SCIENCES V 311
Cardiovascular Physiology (2)
Presents the construction and dynamics of the cardiovascular system in detail. Includes the development of the cardiovascular system, anatomical and physiological characteristics, heart sounds, biophysics of the cardiac cell, cardiac pumping action and its regulation, cardiovascular hemodynamics, coronary blood flow, systemic and pulmonic circulation and the control of regional circulation.

RADIOLOGIC SCIENCES V 312
Cardiovascular Pathophysiology (2)
Continuation of Radiologic Sciences V311, Cardiovascular Physiology. Provides a physiologic and technical back-ground for the various diagnostic and therapeutic techniques in the field. Emphasizes the pathophysiological mechanisms of acquired and congenital cardiovascular diseases as well as their clinical presentation, detection and treatment.
Prerequisite: Radiologic Sciences V 311

RADIOLOGIC SCIENCES V 321
Patient Care & Services in Medical Imaging and Radiation Oncology (2)
Presents basic concepts of the healthcare delivery system and an introduction to the radiologic sciences modalities. Emphasizes patient care, professional ethics and medicolegal issues.
RADIOLOGIC SCIENCES V 335
Vascular Procedures I (2)
Provides lecture presentation and hands-on operation of equipment utilized in a vascular laboratory to evaluate upper and lower extremity arterial and venous disease states and vascular sonography. Emphasizes the clinical application, operation and knobology associated with such equipment. Provides guided practice in the performance of vascular procedures utilized in the assessment of arterial and venous diseases of the upper and lower extremities. Includes plethysmographic procedures, two-dimensional imaging and Doppler techniques.

RADIOLOGIC SCIENCES V 336
Vascular Procedures II (2)
Continuation of Radiologic Sciences V 335, Vascular Procedures I. Provides guided practice in the performance of direct and indirect cerebrovascular testing, intracranial Doppler and abdominal procedures. Emphasizes the operation and knobology of the equipment utilized in these procedures via lecture and hands-on experience.
Prerequisite: Radiologic Sciences V 335

RADIOLOGIC SCIENCES V 353
Vascular Principles I (3)
Introduces the fundamental skills and principles needed to perform vascular diagnostic testing of the upper and lower extremities. Includes arterial and venous vascular procedures with an emphasis upon the physical principles and cross-sectional anatomy common to each of these procedures. Presents the fundamentals necessary to evaluate acquired and congenital vascular disease of the upper and lower extremities.

RADIOLOGIC SCIENCES V 354
Vascular Principles II (3)
Continuation of Radiologic Sciences V 353, Vascular Principles I. Emphasizes cerebrovascular, intracranial Doppler and abdominal disease states. Includes cerebrovascular, intracranial Doppler, abdominal diagnostic assessment, current therapies, two-dimensional imaging and Doppler waveform analysis with an emphasis upon the physical principles and cross-sectional anatomy common to each of these procedures. Presents the fundamentals necessary to evaluate acquired and congenital cerebrovascular, intracranial Doppler and abdominal vascular disease states.
Prerequisite: Radiologic Sciences V 353

RADIOLOGIC SCIENCES V 400
Ultrasound Physics I (2)
Presents general acoustic principles including energy transfer through wave propagation, surface reflection processes, transducer construction, beam profile consideration, image recording devices and an introduction to A-mode, B-mode, M-mode, Doppler, color Doppler, 3-dimensional ultrasound and real-time instrumentation. Emphasizes applied principles of instrumentation, knobology, acoustical artifacts, medical terminology, bioeffects and quality control relative to ultrasound.
RADIOLOGIC SCIENCES V 401
Vascular Anatomy (2)
Presents anatomy specific to vascular sonography, consisting of normal anatomy, anomalies and related structures. Includes correlation with radiographic, CT, angiographic and ultrasonographic images as well as cadaver specimens, utilizing a multimedia approach.

RADIOLOGIC SCIENCES V 403
Ultrasound Physics II (2)
Continues discussion of properties of sound and presents advanced concepts including computer technology and the instrumentation used to create and store the ultrasound image, and introduction to fluid dynamics, spectral, color and amplitude Doppler. Emphasizes advanced principles of physics, knobology, acoustical artifacts, bioeffects/safety and quality assurance relative to ultrasound. Prerequisite: Radiologic Sciences V 400

RADIOLOGIC SCIENCES V 421
Clinical Vascular I (6)
Observing and applying clinical principles in a vascular laboratory. Emphasizes the education of professional attributes and technical skills necessary to perform and interpret vascular procedures relevant to clinical evaluation of arterial and venous extremity disease. Students synthesize learning from the didactic, laboratory and instrumentation courses. Evaluation of cognitive, affective and psychomotor skills is based on competency in scanning protocols and techniques, professionalism and proficiency in patient care.

RADIOLOGIC SCIENCES V 422
Clinical Vascular II (6)
Continuation of Radiologic Sciences V 421, Clinical Vascular I. Prerequisite: Radiologic Sciences V 421

RADIOLOGIC SCIENCES V 423
Clinical Vascular III (8)
Continuation of Radiologic Sciences V 422, Clinical Vascular II. Emphasizes the evaluation of cerebrovascular, intracranial Doppler and abdominal peripheral vascular disease. Students synthesize learning from the didactic and laboratory courses. Requires the continued study of the upper and lower extremity arterial and venous testing procedures. Presents the opportunity to work more independently in the performance of standard vascular procedures. Prerequisite: Radiologic Sciences V 422

RADIOLOGIC SCIENCES V 482
Vascular Review Seminar (2)
Presents a comprehensive review of the physical principles, instrumentation and clinical applications of peripheral vascular imaging in preparation for the registry examination.
RADIOLOGIC SCIENCES V 493
Special Topics in Vascular Sonography (2)
Presents new techniques and information, clinical experiences and presentation of case studies in a weekly seminar format.

RADIOLOGIC SCIENCES V 499
Vascular Sonography Independent Study (1-4)
Capstone course conducted under the direction of departmental faculty. Focuses on review of journal articles and the submission of research papers and/or posters relevant to clinical practice, professional issues or advances in the field.

MASTER OF SCIENCE IN RADIOLOGIC AND IMAGING SCIENCES
Core Courses
RADIOLOGIC SCIENCES 510
Research I (2)
Introduces research methods and data analysis, literature review, qualitative and quantitative research, regulatory and funding agencies and requirements, and scholarly publications and manuscript preparation.

RADIOLOGIC SCIENCES 520
Research II (2)
Presents current research in radiologic and imaging sciences and its modalities. Reviews salient publications, and funding sources in the field. Design and implementation of a research project in radiologic and imaging sciences.

RADIOLOGIC SCIENCES 530
Radiologic and Imaging Sciences (2)
Presents the basic sciences of radiologic professions including physics, instrumentation, data capture and data management.

RADIOLOGIC SCIENCES 610
Advances in Current Technology I (2)
Presents new technologies and developments in the radiologic professions such as PET/CT, IMRT, PACS and 3D ultrasound.

RADIOLOGIC SCIENCES 620
Advances in Current Technology II (2)
Continuation of Radiologic Sciences 610, Radiologic and Imaging Sciences Current Technology I. Topics include teleradiology, integrated modalities and new developments and advances.

RADIOLOGIC SCIENCES 650
Healthcare Law and Ethics (3)
Content varies from year to year. Addresses a group of related current topics in radiologic and imaging sciences of interest to educators and administrators.
RADIOLOGIC SCIENCES 660
Seminar (2)
The final seminar series provides active participation in journal club activities where significant research products are discussed and evaluated through guided workshops. The seminar also provides a venue for formal sharing of either project or thesis with colleagues and faculty advisors.

RADIOLOGIC SCIENCES 690
Capstone Project I (1)
A Radiologic and Imaging Sciences-related, practical project proposed by the student and approved by the advisor. Project is presented in a public forum in the final semester of the program.

RADIOLOGIC SCIENCES 691
Capstone Project II (1)
Continuation of RS 690 Capstone Project I.
Prerequisite: Radiologic Sciences 690.

RADIOLOGIC SCIENCES 692
Capstone Project III (1)
Continuation of RS 691 Capstone Project II. Prerequisite: Radiologic Sciences 691.

Education Courses
RADIOLOGIC SCIENCES 540
Program Management (3)
Provides an orientation to academic program directorship, faculty and staff management, student affairs, faculty and academic affairs, the higher education system in the US, and how colleges and universities in the US work.

RADIOLOGIC SCIENCES 550
Principles of Instruction (3)
Focuses on principles and practice of effective pedagogy, curriculum development and evaluation in radiologic and imaging sciences.

RADIOLOGIC SCIENCES 560
Program Accreditation (3)
Presents topics such as outcome assessments, benchmarking, self-study preparation, applying for and maintaining accreditation and site visits.

RADIOLOGIC SCIENCES 630
Faculty Development (3)
Introduces the meaning and concepts of serving as radiologic and imaging sciences faculty. Topics include scholarship, advisement, teaching, faculty recruitment, retention and development.
Management Courses
RADIOLOGIC SCIENCES 570
US Healthcare System (3)
Introduces the US healthcare system, regulations, organizations and funding methods.

RADIOLOGIC SCIENCES 580
Personnel Management (3)
Introduces principles of management with emphasis on its applications in radiologic departments (radiology, radiation therapy, nuclear medicine) administration.

RADIOLOGIC SCIENCES 590
Accreditation and Quality Management (3)
Examines the process of application for and maintenance of clinical professional accreditation of clinical operations with agencies such as ACR and ACNAHL. Emphasizes the role of the radiologic administrator.

RADIOLOGIC SCIENCES 640
Financial Management (3)
Introduces accounting and financial management as they apply to radiologic administration.

Computed Tomography Courses
RADIOLOGIC SCIENCES CC 500
CT Physics and Instrumentation (3)
In-depth study of the physical principles and instrumentation in computed tomography. Covers the production of x-rays and their interactions with matter. Provides information on data acquisition and image reconstruction, processing and quality. Addresses CT scanner components and operation, scanning factors and their applications.

RADIOLOGIC SCIENCES CC 501
Cross-Sectional Anatomy (1)
Introduces the student to human gross anatomy as seen in the axial, sagittal and coronal planes, and correlates this with CT and MRI images. Includes the brain and spinal cord, structures in the neck, thorax, and abdominal and pelvic cavities.

RADIOLOGIC SCIENCES CC 512
Clinical CT I (6)
Students participate in the diagnostic process of performing CT imaging examinations at clinical sites. Students image anatomic structures and pathology and record the information needed to provide optimal examinations. Provides intensive, hands-on practice under the supervision of the clinical staff. Evaluation is based on clinical competency in all aspects of CT imaging procedures and patient care.

RADIOLOGIC SCIENCES CC 513
Clinical CT II (6)
Continuation of Radiologic Sciences CC 512, Clinical CT I.
Prerequisite: Radiologic Sciences CC 512
RADIOLOGIC SCIENCES CC 514
Clinical CT III (8)
Continuation of Radiologic Sciences CC 513, Clinical CT II.
Prerequisite: Radiologic Sciences CC 513

RADIOLOGIC SCIENCES CC 531
CT Procedures I (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the central nervous system, neck and thorax. Discusses conventional, helical and multi-sliced methods.

RADIOLOGIC SCIENCES CC 532
CT Procedures II (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the musculoskeletal system, abdomen and pelvis. Discusses conventional, helical and multi-sliced methods.
Prerequisite: Radiologic Sciences CC 531

Invasive Cardiovascular Technology Courses
RADIOLOGIC SCIENCES I 502
Noninvasive Testing Principles and Procedures (2)
Provides a foundation in the basic principles of electrocardiography. Presents an overview of the theory and diagnostic techniques utilized by technologists in noninvasive laboratory. Emphasizes the development of a systematic approach to electrocardiographic interpretation, dysrhythmia analysis, exercise stress testing, Holter monitoring, nuclear medicine procedures, phonocardiography and pacemaker evaluation.

RADIOLOGIC SCIENCES I 511
Cardiovascular Physiology (2)
Presents the construction and dynamics of the cardiovascular system in detail. Includes the development of the cardiovascular system, anatomical and physiological characteristics, heart sounds, biophysics of the cardiac cell, cardiac pumping action and its regulation, cardiovascular hemodynamics, coronary blood flow, systemic and pulmonic circulation and the control of regional circulation.

RADIOLOGIC SCIENCES I 512
Cardiovascular Pathophysiology (3)
Continuation of Radiologic Sciences I 511, Cardiovascular Physiology. Provides a physiologic and technical background for the various diagnostic and therapeutic techniques in the field. Emphasizes the pathophysiological mechanisms of acquired and congenital cardiovascular diseases as well as their clinical presentation, detection and treatment.
Prerequisite: Radiologic Sciences I 511
RADIOLOGIC SCIENCES I 513  
Radiobiology and Health Physics (2)  
Presents the principles of cell biology and effects of ionizing radiation at the molecular, cellular and systemic levels. Emphasis is on changes at the cellular level and stochastic vs. deterministic effects and the concept of risk estimates. Covers principles and practice of radiation safety in radiology, including pertinent rules and regulations.

RADIOLOGIC SCIENCES I 531  
Clinical Invasive I (6)  
Requires observation and application of clinical principles in an invasive cardiovascular laboratory. Emphasizes the professional attributes and fundamental technical skills necessary to perform as a team member during invasive procedures. Students synthesize learning from the didactic, laboratory and instrumentation courses. Students must demonstrate competency in the performance of ICVT procedures.

RADIOLOGIC SCIENCES I 532  
Clinical Invasive II (6)  
Continuation of Radiologic Sciences I 531, Clinical Invasive I. Students continue application of ICVT skills. Students must demonstrate competency in the performance of ICVT procedures.  
Prerequisite: Radiologic Sciences I 531

RADIOLOGIC SCIENCES I 533  
Clinical Invasive III (8)  
Continuation of Radiologic Sciences I 532, Clinical Invasive II with active participation in an invasive cardiovascular laboratory. Emphasizes the professional attributes and technical skills necessary to perform as a team member during interventional techniques, electrophysiology studies and specialty applications in congenital and acquired disease states. Presents the opportunity to work more independently in the performance of invasive cardiovascular procedures. Students accept more responsibility for simple procedures and begin to perform more complex procedures under supervision.  
Prerequisite: Radiologic Sciences I 532

RADIOLOGIC SCIENCES I 538  
Invasive Procedures I (3)  
Provides guided practice in the performance of procedures utilized in diagnostic invasive cardiovascular procedures. Includes sterile technique, circulating and monitoring procedures, pharmacologic identification, room set-up and film processing.

RADIOLOGIC SCIENCES I 539  
Invasive Procedures II (3)  
Continuation of Radiologic Sciences I 538, Invasive Procedures I. Provides guided practice in the performance of advanced invasive cardiovascular procedures in a laboratory setting. Emphasizes the clinical application and operation of equipment utilized in interventional and electro-physiologic studies.  
Prerequisite: Radiologic Sciences I 538
RADIOLOGIC SCIENCES I 541
Radiography Physics and Instrumentation I (2)
Prepresents the physical principles underlying radiological technology, focusing on the equipment required to generate x-rays and on the nature and behavior of x-radiation. Includes basic math review, radiation units, mechanics, atomic physics, electricity and magnetism, electromagnetic waves, x-ray generator circuits, x-ray tubes and x-ray interactions with matter.

RADIOLOGIC SCIENCES I 542
Radiography Physics and Instrumentation II (2)
Continuation of Radiologic Sciences I 541, Radiography Physics and Instrumentation I. Introduces concepts of radiographic image quality and describes specialized radiographic equipment. Includes x-ray detection, radiographic contrast, radiographic noise (mottle), x-ray scatter, spatial resolution, geometric effects of projection, tomography (conventional and CT), fluoroscopy, automatic exposure control, conventional and computed radiography, image display and computer hardware and software.
Prerequisite: Radiologic Sciences I 541

RADIOLOGIC SCIENCES I 557
Invasive Principles I (3)
Provides a comprehensive introduction to the fundamental skills and principles needed to perform diagnostic cardiac procedures. Emphasizes indications and contraindications and the collection of diagnostic information obtained during the procedure. Students utilize these fundamentals to evaluate acquired cardiovascular disease states.

RADIOLOGIC SCIENCES I 558
Invasive Principles II (3)
Continuation of Radiologic Sciences I 557, Invasive Principles I. Emphasizes emergency and interventional techniques, electrophysiology studies and specialty applications in congenital and acquired disease states.
Prerequisite: Radiologic Sciences I 557

RADIOLOGIC SCIENCES I 583
Invasive Review Seminar (2)
Prepresents a comprehensive review of the physical principles, instrumentation and clinical applications of invasive cardiac procedures in preparation for the registry examination.

PET/CT Courses
RADIOLOGIC SCIENCES PC 500
CT Physics and Instrumentation (3)
Introduces the physical principles and instrumentation used in computed tomography. Includes production of x-rays and their interactions with matter, data acquisition and image reconstruction, processing, and quality. Addresses CT scanner components and operation, scanning factors, and their applications.
RADIOLOGIC SCIENCES PC 501
Cross-Sectional Anatomy (1)
Introduces the student to human gross anatomy as seen in the axial, sagittal and coronal planes, and correlates this with CT and MRI images. Includes the brain and spinal cord, structures in the neck, thorax, and abdominal and pelvic cavities.

RADIOLOGIC SCIENCES PC 512
PET/CT Clinical I (1)
Provides the opportunity to become competent in the skills necessary to perform high quality PET and/or CT and PET/CT procedures and provide excellent patient care. Clinical education is conducted at assigned clinical affiliate sites, under the supervision of registered technologists or medical personnel. Includes demonstration and observation, and culminates in clinical competency in PET and CT imaging procedures and patient care.

RADIOLOGIC SCIENCES PC 513
PET/CT Clinical II (1)
Continuation of Radiologic Sciences PC 512, PET/CT Clinical I.
Prerequisite: Radiologic Sciences PC 512

RADIOLOGIC SCIENCES PC 514
PET/CT Clinical III (1)
Continuation of Radiologic Sciences PC 513, PET/CT Clinical II.
Prerequisite: Radiologic Sciences PC 513

RADIOLOGIC SCIENCES PC 515
PET Procedures (1)
Encompasses the interrelated aspects of performing PET and PET/CT procedures. Includes anatomy, physiology and pathology of the organ systems, radiopharmaceuticals and CT contrast, patient preparation and care, imaging instrumentation and protocols. Presents and discusses representative images.

RADIOLOGIC SCIENCES PC 516
PET Principles (1)
Includes discussion of the design, operation and quality control of PET and PET/CT scanners. Discusses relevant computer applications and performance characteristics. Presents the physics, synthesis and chemistry of positron-emitting nuclides and radiopharmaceuticals, along with pertinent radiation safety topics.

RADIOLOGIC SCIENCES PC 531
CT Procedures I (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the central nervous system, neck and thorax. Discusses conventional, helical and multi-sliced methods.
RADIOLOGIC SCIENCES PC 532
CT Procedures II (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the musculoskeletal system, abdomen and pelvis. Discusses conventional, helical and multi-sliced methods.
Prerequisite: Radiologic Sciences PC531

CERTIFICATE PROGRAMS
CT Courses
Radiologic Sciences CC 400
CT Physics and Instrumentation (3)
In depth study of the physical principles and instrumentation in computed tomography. Covers the production of x-rays and their interactions with matter. Provides information on data acquisition and image reconstruction, processing and quality. Addresses CT scanner components and operation, scanning factors and their applications.

Radiologic Sciences CC 401
Cross-Sectional Anatomy (1)
Introduces the student to human gross anatomy as seen in the axial, sagittal and coronal planes, and correlates this with CT and MRI images. Includes the brain and spinal cord, structures in the neck, thorax, abdomen and pelvis.

Radiologic Sciences CC 412
Clinical CT I (1)
Students participate in the diagnostic process of performing CT imaging examinations at clinical sites. Students image anatomic structures and pathology and record the information needed to provide optimal examinations. Provides intensive, hands-on practice under the supervision of the clinical staff. Evaluation is based on clinical competency in all aspects of CT imaging procedures and patient care.

Radiologic Sciences CC 413
Clinical CT II (1)
Continuation of Radiologic Sciences CC 412, Clinical CT I.
Prerequisite: Radiologic Sciences CC 412

Radiologic Sciences CC 414
Clinical CT III (1)
Continuation of Radiologic Sciences CC 413, Clinical CT I.
Prerequisite: Radiologic Sciences CC 413

Radiologic Sciences CC 431
CT Procedures I (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the central nervous system, neck, musculoskeletal system, abdomen and pelvis. Discusses conventional, helical and multi-sliced methods.
RADIOLOGIC SCIENCES CC 432  
CT Procedures II (3)  
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the musculoskeletal system, thorax, interventional and special procedures. Discusses conventional, helical and multi-sliced methods.

PET/CT Courses  
RADIOLOGIC SCIENCES PC 400  
CT Physics and Instrumentation (3)  
In depth study of the physical principles and instrumentation in computed tomography. Covers the production of x-rays and their interactions with matter. Provides information on data acquisition and image reconstruction, processing and quality. Addresses CT scanner components and operation, scanning factors and their applications.

RADIOLOGIC SCIENCES PC 401  
Cross-Sectional Anatomy (1)  
Introduces the student to human gross anatomy as seen in the axial, sagittal and coronal planes, and correlates this with CT and MRI images. Includes the brain and spinal cord, structures in the neck, thorax, and abdominal and pelvis.

RADIOLOGIC SCIENCES PC 412  
PET/CT Clinical I (1)  
Provides the opportunity to become competent in the skills necessary to perform high quality PET and/or CT and PET/CT procedures and provide excellent patient care. Clinical education is conducted at assigned clinical affiliate sites, under the supervision of registered technologists or medical personnel. Includes demonstration and observation, and culminates in clinical competency in PET and CT imaging procedures and patient care.

RADIOLOGIC SCIENCES PC 413  
PET/CT Clinical II (1)  
Continuation of Radiologic Sciences PC 412, PET/CT Clinical I.  
Prerequisite: Radiologic Sciences PC 412

RADIOLOGIC SCIENCES PC 414  
PET/CT Clinical III (1)  
Continuation of Radiologic Sciences PC 413, PET/CT Clinical II.  
Prerequisite: Radiologic Sciences PC 413

RADIOLOGIC SCIENCES PC 415  
PET Procedures (1)  
Encompasses the interrelated aspects of performing PET and PET/CT procedures. Includes anatomy, physiology and pathology of the organ systems, radiopharmaceuticals and CT contrast, patient preparation and care, imaging instrumentation and protocols. Presents and discusses representative images.
RADIOLOGIC SCIENCES PC 431
CT Procedures I (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the central nervous system, neck, musculoskeletal system, abdomen and pelvis. Discusses conventional, helical and multi-sliced methods.

RADIOLOGIC SCIENCES PC 432
CT Procedures II (3)
Covers the various imaging protocols utilized to produce anatomy and pathology on CT images specific to the musculoskeletal system, thorax, interventional and special procedures. Discusses conventional, helical and multi-sliced methods.
Prerequisite: Radiologic Sciences PC 431

RADIOLOGIC SCIENCES PC 451
PET Principles (1)
Includes discussion of the design, operation and quality control of PET and PET/CT scanners. Discusses relevant computer applications and performance characteristics. Presents the physics, synthesis and chemistry of positron-emitting nuclides and radiopharmaceuticals, along with pertinent radiation safety topics.
Academic Calendar
## 2015-16 Academic Calendar

<table>
<thead>
<tr>
<th>Event/Deadline</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-FALL SEMESTER (Physical Therapy Students)</strong></td>
<td></td>
</tr>
<tr>
<td>Classes begin</td>
<td>6/1, Mon</td>
</tr>
<tr>
<td>Classes end</td>
<td>8/11, Tues</td>
</tr>
<tr>
<td>Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>8/18, Tues</td>
</tr>
<tr>
<td><strong>PRE-FALL SEMESTER (Physician Assistant Studies Students)</strong></td>
<td></td>
</tr>
<tr>
<td>Classes begin</td>
<td>5/27, Wed</td>
</tr>
<tr>
<td>Classes end</td>
<td>8/7, Fri</td>
</tr>
<tr>
<td>Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>8/14, Fri</td>
</tr>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td></td>
</tr>
<tr>
<td>Orientation/Registration (<em>Entering Class</em>)</td>
<td>Various</td>
</tr>
<tr>
<td>Labor Day Holiday</td>
<td>9/7, Mon</td>
</tr>
<tr>
<td>Classes begin</td>
<td>8/31, Mon</td>
</tr>
<tr>
<td>Drop/Add Period ends</td>
<td>9/14, Mon</td>
</tr>
<tr>
<td>Last date to remove an “I” grade from previous term</td>
<td>9/21, Mon</td>
</tr>
<tr>
<td>Last date to withdraw with a grade of “W”</td>
<td>10/16, Mon</td>
</tr>
<tr>
<td>On-line Registration for Spring Semester begins (anticipated)</td>
<td>11/9, Mon</td>
</tr>
<tr>
<td>Thanksgiving Holidays begin / No classes scheduled</td>
<td>11/25, Wed</td>
</tr>
<tr>
<td>Thanksgiving Holidays end / Classes resume</td>
<td>11/28, Sat</td>
</tr>
<tr>
<td>Classes end</td>
<td>12/11, Fri</td>
</tr>
<tr>
<td>Final Examinations Begin</td>
<td>12/12, Sat</td>
</tr>
<tr>
<td>Final Examinations End</td>
<td>12/18, Fri</td>
</tr>
<tr>
<td>Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>12/22, Tues</td>
</tr>
<tr>
<td>Last date to file Application for Graduation</td>
<td>12/31, Thurs</td>
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<tr>
<td><strong>SPRING SEMESTER</strong></td>
<td></td>
</tr>
<tr>
<td>On-Line Registration for Spring Semester ends</td>
<td>1/4, Mon</td>
</tr>
<tr>
<td>Classes begin</td>
<td>1/11, Mon</td>
</tr>
<tr>
<td>Drop/Add Period ends</td>
<td>1/25 Mon</td>
</tr>
<tr>
<td>Last date to remove an “I” grade from previous term</td>
<td>1/29, Fri</td>
</tr>
<tr>
<td>Last date to withdraw with a grade of “W”</td>
<td>2/26, Fri</td>
</tr>
<tr>
<td>Spring Recess begins / No classes scheduled</td>
<td>2/29, Mon</td>
</tr>
<tr>
<td>Spring Recess ends / Classes resume</td>
<td>3/7, Mon</td>
</tr>
<tr>
<td>On-line Registration for Summer/Fall Semester begins (anticipated)</td>
<td>3/21, Mon</td>
</tr>
<tr>
<td>Classes end</td>
<td>4/29, Fri</td>
</tr>
<tr>
<td>Final Examinations Begin</td>
<td>5/2, Mon</td>
</tr>
<tr>
<td>Final Examinations End</td>
<td>5/7, Sat</td>
</tr>
<tr>
<td>Senior Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>5/9, Mon</td>
</tr>
<tr>
<td>On-line Registration for Summer Semester ends</td>
<td>5/10, Tues</td>
</tr>
<tr>
<td>All other Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>5/11, Wed</td>
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<tr>
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<td>SUMMER SESSION - 1st Session</td>
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<tr>
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<td>2016</td>
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<tr>
<td>Commencement Exercises</td>
<td>6/1, Wed</td>
</tr>
<tr>
<td>Classes begin</td>
<td>5/16, Mon</td>
</tr>
<tr>
<td>Holiday, Memorial Day</td>
<td>5/30, Mon</td>
</tr>
<tr>
<td>Drop/Add Period ends</td>
<td>5/24, Tues</td>
</tr>
<tr>
<td>Last date to withdraw with a grade of “W”</td>
<td>5/31, Tues</td>
</tr>
<tr>
<td>Last date to remove an “I” grade from previous term</td>
<td>6/13, Mon</td>
</tr>
<tr>
<td>Classes end</td>
<td>6/20, Mon</td>
</tr>
<tr>
<td>Final Examinations Begin</td>
<td>6/21, Tues</td>
</tr>
<tr>
<td>Grades due in Registrar’s Office, 9:00 A.M.</td>
<td>6/24, Fri</td>
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</tbody>
</table>

*The University reserves the right to make changes to the academic calendar as circumstances may require.*