Faculty  Archer - Head, Chelf, Knapp, Marsh

The Chemical and Physical Sciences Department at Missouri Southern, in cooperation with the engineering staff at the Missouri University of Science and Technology and the University of Missouri-Columbia, have prepared booklets describing the Cooperative Engineering Program between these schools and MSSU. These booklets list the course sequence for a student taking the first two or two and one-half years of an engineering science curriculum at Southern and planning to transfer to MS&T or UMC. The plan also includes the courses the student will take at MS&T or UMC to complete a BS degree in various engineering disciplines. Engineering school general education requirements are different from liberal arts requirements so it is strongly recommended that the student consult with a pre-engineering adviser in the Physical Science dept. Any student or adviser who desires a copy of the booklet should contact the Chemical and Physical Sciences Department.

Although most of the engineering programs are standard for the first two years, there are a few differences and thus the student should meet with a pre-engineering adviser during the first semester. If a student wishes to transfer to a school other than MS&T or UMC, it is suggested that the catalog of that school be reviewed for any differences in its program and the MS&T or UMC outline. College catalogs are available in the Reserve Area of Spiva Library. Any adviser who desires a copy of the booklet should contact the Chemical and Physical Sciences Department.

Pre-Engineering Curriculum

<table>
<thead>
<tr>
<th>Semester Hours</th>
<th>General Educations Requirements (p. 46) 27-28**</th>
<th>Pre-Engineering Requirements 48-49</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 250 General Physics I*</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PHYS 260 General Physics II*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYS 290 General Physics III*</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYS 291 General Physics III Lab.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PHYS 312 Statics*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 151 General Chemistry I**</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MATH 150 Calculus with Analytical Geometry I**</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MATH 250 Calculus with Analytical Geometry II*</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MATH 260 Calculus with Analytical Geometry III*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CIS 110 Programming I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECON 201 Principles of Economics (Macro)**</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective (MATH or Physics)**</td>
<td>7-8</td>
<td></td>
</tr>
<tr>
<td>Electives (Humanities/Social Science/Drafting/Chemistry/Computer Science)**</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>65-66</td>
<td></td>
</tr>
</tbody>
</table>

*See course descriptions for prerequisites.
**Required math, economics and physics courses simultaneously satisfy 11 hours of General Education Requirements and major requirements.
***The student should meet with a pre-engineering adviser for the proper selection depending on the field of engineering.

For additional information contact:
Marsi Archer
Office: Reynolds Hall 213
Phone: 417.625.9541
Email: archer-m@mssu.edu
ogy course credit may be granted to the Registered Radiologic Technologist equal to that granted to the graduating Associate of Science student at the time the Registered Radiologic Technologist starts the program. Students must then complete the additional Associate of Science Degree General Education Requirements as outlined in the catalog.

A BS in Health Science with an emphasis in radiologic technology option is also available to those wishing to seek a more advanced degree beyond the A.S. option. For more information, please see the health science degree option in this catalog.

For additional information visit our website: http://www.mssu.edu/academics/technology/radiology/index.php

### Course Descriptions

#### RAD 0101 (F) 3 hrs. cr.
**Introduction to Radiology**
Basic procedures and equipment in the radiology department. Includes organization, function and supervision of a radiology department with a history of x-ray, patient care basics, ethical principles and legal aspects of radiologic technology and basic principles of radiation protection. Three hours lecture per week.

#### RAD 0110 (F) 2 hrs. cr.
**Clinical Training I**
Clinical training with special emphasis in the areas of the thorax, pelvis, extremities and spine radiography.

#### RAD 0111 (F,S) 3 hrs. cr.
**Medical Terminology**
The language of medicine, especially as related to radiology, through a comprehensive study of the more common medical roots, prefixes and suffixes. Relates medical roots to everyday English words. A survey of procedural, pharmacological, medical and surgical terms are included. Three hours lecture per week. Cross-listed as HS 111.

#### RAD 0132 (S) 3 hrs. cr.
**Principles of Radiographic Exposure**
Fundamental principles of technique and technique conversion with particular emphasis on the factors that directly and indirectly affect radiographic exposure. Emphasis on radiation protection, processing, image artifacts and digital modalities. Three hours lecture per week.

#### RAD 0142 (F) 3 hrs. cr.
**Radiographic Positioning I**
Basic radiographic positioning including both standard and specialized positions of the abdomen, chest, bony thorax and spine. Image critique and radiation protection are included as critical parts of this course. One and a half hours lecture, three hours lab per week.

#### RAD 0170 (F) 3 hrs. cr.
**Radiologic Physics**
The physics of radiology. The physical principles of X-ray production, including theory in electricity, rectification, circuitry and basic equipment maintenance. Three hours lecture per week.

#### RAD 0210 (F) 2 hrs. cr.
**Clinical Training II**
Intensive clinical training with emphasis in fluoroscopy and various contrast studies. Additional experience and competencies will also be obtained in the areas of general radiography, portables and an introduction to surgical rotations.

#### RAD 0241 (S) 3 hrs. cr.
**Radiographic Positioning II**
Radiographic procedures and positioning related to the bony thorax, digestive, urinary and reproductive systems. A basic overview is given of surgical, mobile and trauma radiography. Special emphasis on the use and preparation of contrast media, patient preparation and procedures employed, including tomography to visualize organs of interest and pathophysiology of the above systems. Two and one half hours lecture, one hour lab per week. Prerequisites: RAD 142 or permission of instructor.
RAD 0290  (Su)  2 hrs. cr.
Clinical Training III
Clinical training in special procedures requiring sterile fields and surgical cases. Continued practice and competency in general radiography, surgery and contrast studies. Prerequisites: RAD 110, RAD 210.

RAD 0301  (Su)  2 hrs. cr.
Image Critique and Quality Management in Radiology
Theory and practice in the art and science of evaluating the technical quality of images. Students will develop critical-thinking and problem-solving skills to correct positioning and technical errors. Includes an introduction to quality assurance and pathophysiology of the skeletal and respiratory systems. Prerequisites: RAD 132, RAD 170. Four hours of lecture per week.

RAD 0320  (F)  3 hrs. cr.
Radiographic Positioning III
An in-depth study of the anatomy and radiographic equipment and positioning used in skulls, facial bones, sinuses, arthrography, long bone measurements and mammography. Part II of this course will include an introduction to CT and an overview of sectional anatomy of the brain, spine, neck, chest and abdomen. One and a half hours of lecture, three hours of lab per week. Prerequisite RAD 241.

RAD 0340  (F)  3 hrs. cr.
Clinical Training IV
Continued training in special procedures with increased responsibility in surgical radiography. Continued clinical proficiency development in general radiography, including contrast studies, surgical, portable, facial and skull radiography. Prerequisite: RAD 290 or permission of instructor.

RAD 0350  (F)  3 hrs. cr.
Patient Care and Radiation Protection in Radiology
A continuation of basic patient care and radiation protection learned to this point in the program. Course content includes signs, symptoms and appropriate technologist response to common emergencies encountered in radiology. Infection control, chest tubes, enteral tubes and vascular access lines, as well as medication administration, venipuncture and basic ECG will also be covered. Emphasis will be placed on radiation biology and radiation protection of the patient and technologist involved in patient care procedures. Three hours lecture per week. Prerequisites: RAD 101 or permission of instructor.

RAD 0360  (S)  3 hrs. cr.
Clinical Training V
Students will rotate through special procedures with increased responsibility and do an introductory rotation through CT scans. In addition, students will continue to incorporate skills and competencies in basic radiologic procedures. Prerequisite: RAD 340.

RAD 0370  (S)  3 hrs. cr.
Special Topics in Radiology
Course covers angiography, myelography, digital modalities, bone densitometry and CT with an introductory segment on MRI and ultrasound. Special emphasis on equipment operation, patient care, contrast preparation, procedural steps and pathophysiology. Three hours lecture.

RAD 0380  (Su)  2 hrs. cr.
Clinical Training VI
Clinical training in CT and an optional rotation through MRI or other advanced modality. Continued work in proficiency in basic radiographic examinations and competencies. Prerequisite - RAD 360.

RAD 0399  (Su)  3 hrs. cr.
Advanced Radiology
A capstone course designed to prepare students for the national certification examination. Course will include advanced concepts and testing over all major aspects covered by the national certification examination as outlined by the American Registry of Radiologic Technologists. Prerequisites - RAD 101, RAD 170, RAD 132, RAD 241. Six hours lecture per week.

Faculty  Pippin - Head, Dunaway, Whiteman

Mission
The mission of the program is to provide an outstanding educational program that offers students an opportunity to develop knowledge, skill and attitudes essential for safe, effective practice within the scope of respiratory care practitioners.

Goals
Program goals are:
1. To supply the community with respiratory care practitioners.
2. To prepare program graduates to pass the National Board for Respiratory Care Credentialing Examinations.

A career in the medical field can be a dynamic and rewarding opportunity. The changing nature of the medical profession is creating a demand for multi-skilled health professionals with communication, interpersonal and excellent clinical skills such as the respiratory care practitioner. The Respiratory Therapy Program is designed to prepare students to be employed in the hospital, clinic, sleep laboratory and alternate care settings such as a durable medical equipment company. Respiratory Therapy Practitioners perform a variety of clinical, diagnostic and management functions in these settings. The Respiratory Therapy Department offers these career tracts:
1. Associate of Science Degree
2. Baccalaureate Degree in Health Sciences. See General Education Requirements and course descriptions on page 49.

The curriculum offers the following options:
- Graduates of the associate degree respiratory care program will be eligible to take the NBRC Certification in Respiratory Therapy to become a Certified Respiratory Therapist (CRT). Successful completion of the CRT exam will allow the graduate to take the written registry and clinical simulation exams to become a Registered Respiratory Therapist (RRT).
- For those students interested in a bachelor degree, there are three options. A Bachelor of Science in Management Technology with an emphasis in General Business, a Bachelor of General Studies or a Bachelor’s in Health Sciences, designed for graduates of the Respiratory Therapy program.

The Associate of Science Degree Program in Respiratory Therapy prepares students for a position as a respiratory care practitioner. The program is provided by Missouri Southern State University and Franklin Technology Center, through a consortium for respiratory care education. The program is accredited by the Commission on Accreditation for Respiratory Therapy,