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## 250 / Radiologic Technology, Respiratory Therapy

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Rad 170 <b>Radiologic Physics</b> 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.	3 hrs. cr.	Rad 360 (S) <b>Clinical Training V</b> 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. Prerequisites – Rad 110, Rad 210, Rad 290, Rad 340. Twenty hours of clinical training per week.	3 hrs. cr.
Rad 210 (F) <b>Clinical Training II</b> 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. Fifteen hours of clinical training per week.	2 hrs. cr.	Rad 370 (S) <b>Special Topics in Radiology</b> In-depth studies in angiography, myelography and CT with introductory segments on MRI and ultrasound. Special emphasis on equipment operation, patient care, contrast preparation, procedural steps, and pathophysiology. Two hours lecture per week.	2 hrs. cr.
Rad 241 <b>Radiographic Positioning II</b> Radiographic procedures related to the digestive, biliary, urinary, mammary, and reproductive systems. 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. Course will include an introduction to myelography and arteriography. Prerequisites – Rad 142 or permission of instructor.	3 hrs. cr.	Rad 380 (Sum) <b>Clinical Training VI</b> Clinical training in CT, angiography and an introductory rotation through MRI. Continued work and proficiency in basic radiographic examinations and competencies. Prerequisites – Rad 110, Rad 210, Rad 290, Rad 340, Rad 360. Twenty-five hours clinical training per week.	2 hrs. cr.
Rad 290 (Sum) <b>Clinical Training III</b> Introductory clinical training in myelography and vascular procedures. Continued practice and competency in general radiography, surgery, and contrast studies. Prerequisites – Rad 110, Rad 210. Twenty-five hours of clinical training per week.	2 hrs. cr.	Rad 399 (Sum) <b>Advanced Radiology</b> 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 142, Rad 241. Six hours lecture per week.	3 hrs. cr.
Rad 301 (Sum) <b>Film Critique and Quality Management in Radiology</b> Theory and practice in the art and science of evaluating the technical quality of films. 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 170, Rad 132. Three hours of lecture and two hours of lab per week.	2 hrs. cr.		
Rad 320 (F) <b>Radiographic Positioning III</b> An in-depth study of the anatomy and radiographic positioning of the skulls, facial bones, and sinuses. 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. Prerequisites – Rad 142, Rad 241. 2.5 hours of lecture, one hour of lab per week.	3 hrs. cr.		
Rad 340 (F) <b>Clinical Training IV</b> Continued training in special procedures, including myelograms and vascular procedures. Continued clinical proficiency development in general radiography, including contrast studies, surgical, portable, facial and skull radiography. Prerequisites – Rad 110, Rad 210, Rad 290, or permission of instructor. Twenty hours of clinical training per week.	3 hrs. cr.		
Rad 350 (F) <b>Patient Care in Radiology</b> A continuation of basic patient care learned to this point in the program. Course content includes emergency protocols, including shock, seizures, diabetic emergencies, strokes, and trauma care of the acute patient. Infection control, chest tubes, enteral tubes, and vascular access lines, as well as medication administration will be covered. Prerequisites – Rad 101 or permission of instructor. Three hours lecture per week.	2 hrs. cr.		

## RESPIRATORY THERAPY

Justice Center 144, 417.659.4405

**Faculty** Pippin - Head, Hudson, Erwin, Dunaway

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 Programs are designed to prepare students to be employed in the hospital, clinic, laboratory, and alternate care settings such as the patient's home. Respiratory Therapist perform a variety of clinical, diagnostic, and management functions in these settings.

The Respiratory Therapy Department offers these career tracts:

- (1) an Entry-Level Associate of Science degree for applicants entering the field,
- (2) an Upper-Division, Advanced-Level Certificate tract for graduates of an Associate of Science Entry-Level Respiratory Therapy Program and,
- (3) a Baccalaureate Degree in Health Sciences, for graduates of the advanced-level program. See Core Requirements and course descriptions on page 235.

The curriculum offers the following options:

- Entry-Level Associate of Science in Respiratory Therapy, designed for those entering the respiratory therapy field, requires 64 semester hours of general education and professional courses.
- Advanced-Level, Upper-Division Certificate Program in Respiratory Therapy designed for graduates of an entry-level, associate degree respiratory therapy program, who have passed the NBRC Certification examination or who have applied to take the CRT exam. Successful completion of the CRT exam must occur before completion of the Advanced level curriculum. Graduates from a certificate entry level program without an Associate of Science degree must complete core requirements as well as the advanced level respiratory therapy course requirements.
- 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 Advanced-Level Respiratory Therapy program.

**The Entry-Level, Associate of Science Degree Program in Respiratory Therapy** prepares students for a position as a certified respiratory therapist. The program is provided by Missouri Southern State University and Franklin Technology Center, through a consortium for respiratory therapy education. The programs are accredited by the Committee on Accreditation for Respiratory Care and the Commission on Accreditation of Allied Health Education Programs. The Associate of Science, entry-level program consists of a core academic component and a major concentration component. The academic section consists of the MSSU Associate of Science degree core requirements, including courses in the Humanities and Fine Arts, Natural Science, Social and Behavioral Sciences, Mathematics, English, Communication, and Physical Education concentration areas. The respiratory therapy major concentration components comprise both the didactic and respiratory therapy clinical instructional areas.

**The Advanced-Level, Upper-Division, Certificate Program** builds upon the entry-level Associate of Science degree program. It consists of an advanced level respiratory therapy major concentration component. The concentration component comprises respiratory therapy education in the didactic and clinical competencies required of an advanced level trained respiratory care practitioner. All students must successfully complete the NBRC Entry Level Certification Examination (CRT) prior to graduation from the advanced level program and must agree to sit for the Advanced Level Registry Examination (RRT) immediately upon graduation. Currently the advanced level program is offered as an online program.

Registered respiratory therapist function in a wide variety of settings. As clinicians they work in adult intensive care units, pediatric and neonatal intensive care units, emergency and trauma units, operation and recovery rooms, rehabilitation programs, home health agencies, and a variety of cardiopulmonary diagnostic laboratories. Some graduates pursue

advanced degrees in management, education, public health, or the biomedical sciences. Graduate degrees lead to positions in educational institutions in teaching or research capacities. Senior respiratory care practitioners may be responsible for the management and operation of respiratory care departments.

Respiratory Therapy Students must demonstrate numerous competencies representing all three learning domains: the cognitive, psychomotor, and affective domains. Students learn, practice, and verify these competencies in a number of settings including the classroom, laboratory, and clinic. To achieve the required competencies in the classroom setting, respiratory therapy students must perceive, assimilate, and integrate information from a variety of sources. These sources include oral instruction, printed material, visual media, and live demonstrations. Students must participate in classroom discussion, give oral reports, and pass written and/or computer-based examinations of various formats. Completion of these tasks require cognitive skills, such as reading, writing, and problem-solving. To be physically capable of the classroom work, students must, with assistance, be able to: hear, see, speak, sit, and touch. Respiratory therapy laboratories provide students with the opportunity to view demonstrations, evaluate and practice with medical devices, and perform simulated clinical procedures. In addition to the cognitive skills required in the classroom, students must demonstrate psychomotor skills in manipulation of patients and equipment, as well as general professional behaviors, like team-building and interpersonal communications. To satisfy laboratory and clinic requirements, students must perform all procedures without critical error.

Admission to Missouri Southern or Franklin Technology Center does not automatically grant admission to the respiratory therapy program. In addition to meeting admission requirements to the University, candidates must apply for admission to the Department of Respiratory Therapy.

Enrollment is competitive; Applicants must submit the necessary information to the department office by the designated deadline to be considered for acceptance. Evidence of computer literacy and satisfactory completion of the following prerequisites with a "C" or better must be presented: Math 030 Intermediate Algebra or higher. Department Recommendation: High school or college course work in Physical Science and Chemistry. Interested individuals are encouraged to contact the Program Director of Respiratory Therapy for more specific information regarding admissions criteria.

In addition to established fees for all university students, other costs are incurred by respiratory therapy students such as: uniforms, books, self assessment examinations, graduation pins, AARC student membership dues, liability insurance, and various expense for transportation to off campus clinical sites and professional meetings.

The advanced-level, upper-division program is for the graduate of an accredited entry-level associate degree respiratory therapy program. Previous respiratory care education and practice are recognized and valued throughout the curricu-

lum. The advanced level curriculum expands respiratory therapy knowledge and practice gained in the entry-level program to meet the changing health care needs of the community and region. Graduates of Missouri Southern's Associate degree entry-level certification program are eligible for direct admission to Southern's Advanced Level Respiratory Therapy program. Recent graduates must pass the CRT exam prior to completion of the advanced level curriculum. Graduates of other accredited entry-level programs are eligible for admission upon meeting transfer requirements and current certification from the National Board for Respiratory Care.

## Graduate outcomes

Graduates of the program will:

- Demonstrate the ability to comprehend, apply, and evaluate clinical information relevant to their role as respiratory therapist.
- Demonstrate the technical proficiency in all skills necessary to fulfill the role as a respiratory therapist.
- Demonstrate personal behavior consistent with professional and employer expectations for the respiratory therapist.

## Admission Criteria

### (Entry-Level, Associate of Science in Respiratory Therapy)

Application for the entry-level program should be made **directly to the Respiratory Therapy Department Office** on the Missouri Southern State University campus (special admissions procedures are required for admittance into this program in addition to admission to MSSU).

1. Continuous enrollment, readmission or admission to Missouri Southern and Franklin Technology Center as a transfer student.
2. Completion of an approved college-level math course.
3. Provide documentation of computer literacy.
4. Minimum percentile score on the Health Occupations Basic Entrance Test administered by the Department.

Admission to the program is competitive. Applicants who meet all admission criteria, have completed math and biology courses, and/or have healthcare experience will be given preference in admission.

## Admission Criteria

### (Upper-Division, Advanced-Level Program)

1. Graduation from an Associate of Science degree entry-level program accredited by the Commission on Accreditation of Allied Health Education programs (CAAHEP) for entry level respiratory care or graduate from a certificate entry level program who concurrently completes the Associate of Science degree with the advanced level curriculum.
2. Continuous enrollment, readmission, or admission to Missouri Southern as a transfer student.
3. Preference given to persons currently holding certification from the National Board for Respiratory Care, Inc. and/or a graduate of Missouri Southern's entry-level respiratory therapy program.

## Entry-Level Associate of Science in Respiratory Therapy

Major code 5600

<b>Core Requirements (p. 33)</b> . . . . .	<b>25</b>
<b>Respiratory Therapy Major Requirements</b> . . . . .	<b>39</b>
Resp 101 Respiratory Therapy Foundations . . . . .	3
Resp 102 Cardiopulmonary Sciences . . . . .	3
Resp 105 Cardiopulmonary Anatomy & Physiology . . . . .	3
Resp 107 Respiratory Therapy Procedures . . . . .	3
Resp 108 Respiratory Procedures Lab . . . . .	3
Resp 120 Cardiopulmonary Pathology . . . . .	3
Resp 125 Respiratory Therapy Clinical I . . . . .	3
Resp 129 Cardiopulmonary Pharmacology . . . . .	3
Resp 222 Introduction to Mechanical Ventilation . . . . .	4
Resp 226 Cardiopulmonary Diagnostic . . . . .	3
Resp 239 Respiratory Therapy Clinical II . . . . .	5
Resp 311 Neonatal/Pediatric Care . . . . .	3
CORE [Bio 121 Human Anatomy & Physiology I] . . . . .	4
CORE [Math 030 or higher] . . . . .	3
<b>Total</b> . . . . .	<b>64</b>

## Advanced-Level, Upper-Division Certificate in Respiratory Therapy

### Associate of Science in Respiratory Therapy

<b>(entry-level program)</b> . . . . .	<b>64</b>
<b>Respiratory Therapy Major Requirements</b> . . . . .	<b>18</b>
Resp 307 Cardiopulmonary Assessment . . . . .	6
Resp 312 Mechanical Ventilation . . . . .	3
Resp 313 Alternate Site Respiratory Care (WI) . . . . .	3
Resp 340 Advanced Level Clinical Practice . . . . .	5
Resp 341 Research Issues, Methods . . . . .	1
<b>Total</b> . . . . .	<b>82</b>

## Suggested Order of Study

### Associate of Science Degree

Major code 5600

#### Respiratory Therapy (Entry-level)

##### Prerequisite:

Math 030	Intermediate Algebra or Higher	3
CORE*	[Eng 101 English Comp] WI	3
	Respiratory Therapy Orientation	6

##### Freshman Year

(Missouri Southern/Franklin Technology Center)

Fall Semester

CORE	[Human Anatomy/Physiology I]	4
CORE*	[Comm 100 Oral Communication]	3
Resp 101	Respiratory Therapy Foundations	3
Resp 102	Cardiopulmonary Sciences	3

Resp 107	Respiratory Therapy Procedures	3
Resp 108	Respiratory Therapy Procedures Lab	3
		<b>19</b>
Spring Semester		
CORE*	[Humanities and Fine Arts]	3
CORE*	[Kine 101 Physical Activity]	1
Resp 105	Cardiopulmonary Anatomy & Physiology	3
Resp 120	Cardiopulmonary Pathology	3
Resp 125	Clinical Respiratory Therapy Experience I	3
Resp 129	Cardio Pharmacology	3
		<b>16</b>
Summer Semester		
CORE*	Psy 100 or Soc 100	3
CORE*	Kine 103 Lifetime Wellness	2
		<b>5</b>

**Sophomore Year**

(Missouri Southern/Franklin Technology Center)

Fall Semester		
CORE*	Hist 110 or Hist 120	3
Resp 222	Introduction to Mechanical Ventilation	4
Resp 226	Cardio Diagnostics	3
Resp 239	Clinical Respiratory Therapy Experiences II	5
Resp 311	Neonate/Pediatric Respiratory Care	3
		<b>18</b>
		<b>64</b>

[Entry Level Program Department Recommendations]

\*Identified Core courses may not necessarily be taken in this order, however all Major courses must be taken in sequence and in the order presented in this catalog. Associate of Science degree students must meet the Missouri Constitution Requirement by completing PSc 120 or the Missouri Constitution Test.

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## **Suggested Order of Study**

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**Advanced-Level**

**Junior Year** (Missouri Southern State University)

Spring Semester		
Resp 307	Cardiopulmonary Assessment	6
Resp 312	Mechanical Ventilation	3
Resp 313	Alternate Site Resp Care (WI)	3

Summer Semester

(Missouri Southern State University)

Resp 340	Advanced Level Respiratory Therapy Clinical Experience	5
Resp 341	Research Issues, Methods, & Problems in Respiratory Care	1

**Advanced-Level** **18**

**Entry-Level and Advanced-Level Major** **82**

[Advanced-Level Program Department Recommendations]

These graduates must have passed the National Board for Respiratory Care certification examination prior to earning an advanced level certificate in respiratory therapy from Missouri Southern State University. The entry-level core, of students entering the advanced-level curriculum, should include Fundamentals of Physical Science or Introduction to Chemistry, Intermediate Algebra, Introduction to Computers, and a total of seven semester credits of Human Anatomy and Physiology I and Cardiopulmonary Anatomy and Physiology.

**For additional information contact:**

Glenda Pippin, Director  
 Consortium for Respiratory Therapy Education  
 Justice Center, MSSU Campus  
 3950 East Newman Road  
 Joplin MO 64801  
 Phone: 417.659.4405  
 Fax: 417.659.4408  
 Email: pippin-g@mssu.edu

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## **Course Descriptions**

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Resp 101 (F) 3 hrs. cr.

**Respiratory Therapy Foundations**

Entry level information is presented regarding respiratory therapy history from its conception to its current goals and standing. Topics covered include medical terminology, hospital and respiratory therapy department structure and management, psychosocial aspects of patient care, and medical ethics. A clinical session, allows the student an orientation rotation at the program's clinical sites. Prerequisite: Admission to the respiratory therapy program and completion of a College Level Math course.

Resp 102 (F) 3 hrs. cr.

**Cardiopulmonary Sciences**

Focuses on the sciences used in the practice of respiratory therapy. Emphasis will be placed upon physics, chemistry, and microbiology as related to the cardiopulmonary sciences. Prerequisite: Admission to the respiratory therapy program.

Resp 105 (S) 3 hrs. cr.

**Cardiopulmonary Anatomy and Physiology**

An in-depth presentation of the cardiopulmonary system, its abnormalities, and corrective techniques as related to respiratory therapy. Included are the concepts of the cardiovascular system, ventilation, diffusion of pulmonary gases, hemodynamic measurements, ventilation perfusion relationships, oxygen and carbon dioxide transport, acid base balance, and arterial blood gas analysis. Prerequisite: Admission to the respiratory therapy program, college level math course and completion of Bio 121.

Resp 107 (F) 3 hrs. cr.

**Respiratory Therapy Procedures**

Theory and practice of basic respiratory therapy procedures as outlined in the National Board for Respiratory Care (NBRC) entry level examination content outline. Including cardiopulmonary assessment, medical gas administration, oxygen therapy, infection control, equipment maintenance, chest physiotherapy, chest expansion therapy, airway management, bedside pulmonary function testing, arterial puncture, and administering medicated aerosol therapy. Prerequisites: Admission to the respiratory therapy program and concurrent enrollment or completion of the Respiratory Therapy Procedures Laboratory course.

Resp 108 (F) 3 hrs. cr.

**Respiratory Therapy Procedures Laboratory**

Students practice entry level respiratory care procedures, using state-of-the-art equipment, in the clinical laboratory under simulated patient situations. The student will address the three difficulty levels of learning, in the laboratory environment (Recall, Application, and Analysis).

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## 254 / Respiratory Therapy

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Prerequisites: Admission to the respiratory therapy program and concurrent enrollment or completion of Resp 107.

Resp 120 (S) 3 hrs. cr.  
**Cardiopulmonary Pathology**

Study of concepts and theory of selected cardiopulmonary diseases, to include: definition, clinical manifestations, etiology, pathologic, radiological and laboratory findings; prevention, prognosis, and treatment. Prerequisite: Admission to the respiratory therapy program and completion of Bio 121.

Resp 125 (S) 3 hrs. cr.  
**Clinical Respiratory Therapy Experience I**

Clinical instruction supplemented by clinical conferences that allow the student to apply the classroom and laboratory respiratory therapy competencies mastered in specific respiratory therapy courses. Prerequisites: Resp 107 & Resp 108.

Resp 129 (S) 3 hrs. cr.  
**Cardiopulmonary Pharmacology**

Comprehensive overview of the general principles of pharmacology. Focuses on the drugs and drug groups that are either administered by respiratory therapy personnel, or those that play a role in the care of cardiopulmonary patients. Prerequisite: Bio 121 and admission to the respiratory therapy program.

Resp 222 (F) 4 hrs. cr.  
**Introduction to Mechanical Ventilation**  
*(Life Support Technology)*

Emphasis on the technical components of mechanical ventilators, their classification, principles of operation, attachments, and the flow/pressure/volume curves generated by various ventilators, compliance, and resistance. An introduction to the management of patients receiving mechanical ventilation will be presented. Prerequisite: Admission to the respiratory therapy program.

Resp 226 (F) 3 hrs. cr.  
**Cardiopulmonary Diagnostics**

Theory, application, and equipment for diagnosing respiratory pathologies through the diagnostic concepts used in respiratory therapy. Include techniques utilized for measurement of lung gas volumes, capacities, flows, and cardiopulmonary status during exercise testing. Prerequisite: Admission to the respiratory therapy program.

Resp 239 (F) 5 hrs. cr.  
**Clinical and Laboratory Experience II**

Clinical instruction supplemented by clinical conferences that allow the student to apply the knowledge and respiratory care skills mastered in the Respiratory Care courses: Cardiopulmonary Diagnostics, Introduction to Mechanical Ventilation, and Neonatal and Pediatric Respiratory care in the laboratory and clinical setting. The course will emphasize ventilator care, diagnostic procedures, and alternate site care (home care). Prerequisite: Resp 125.

Resp 307 (F, S) 6 hrs. cr.  
**Cardiopulmonary Assessment**

A systematic approach to advanced cardiopulmonary patient assessment. Emphasis is on evaluation of the respiratory care plan based upon laboratory data, electrocardiogram interpretation, fluid and electrolyte balance, acid base balance and oxygen transport, pulmonary function testing, exercise testing, interpretation of chest x-rays, bronchoscopy, and hemodynamic monitoring. Prerequisite: Admission to the advanced-level respiratory therapy program. Graduates of an advanced-level respiratory therapy program may use this course as a review for their national board examinations.

Resp 311 (F) 3 hrs. cr.  
**Neonatal and Pediatric Respiratory Care**

Respiratory care of the neonatal and pediatric population beginning with fetal development and continuing through assessments of infants including, gestational age, APGAR scoring, and Silverman scoring. Various heart/lung deficiencies will also be discussed as well as treatment modalities. Prerequisite: Admission to the respiratory therapy program.

Resp 312 (F, S) 3 hrs. cr.  
**Advanced Mechanical Ventilation** *(Advanced Life Support)*

A continuation of the Introduction to Mechanical Ventilation (Life Support Technology) course. In-depth study of ventilator management in critical care, long-term care, and the home environment utilizing case studies, and clinical problem based learning sessions. In addition the course addresses ACLS (Advanced Cardiac Life Support). Prerequisite: Resp 222 and admission to advanced-level respiratory therapy program.

Resp 313 (F, S) 3 hrs. cr.  
**Alternate Site Respiratory Care** *(Writing Intensive)*

Theoretical aspects of providing respiratory therapy at alternate sites. Includes components of home respiratory therapy, extended care units, long term care facilities, ventilator rehabilitation centers, physician offices, land/air transport, outpatient diagnostic clinics. Introduces the fundamentals of teaching and learning theories. Prerequisite: Admission to the advanced level respiratory therapy program.

Resp 340 (F, S, Summer) 5 hrs. cr.  
**Advanced-Level Respiratory Therapy Clinical Experience**

Progressive process of developing cognitive levels at the recall, application, and analysis levels as a respiratory care practitioner. Correlates directly with the Advanced Mechanical Ventilation (Advanced Life Support ) course, Cardiopulmonary Assessment, Neonate/Pediatric, and the Alternate Site (Management/Pulmonary Rehabilitation/Home Care) courses, to provide the student a clinical environment to demonstrate these learned advanced-level respiratory care competencies. Prerequisite: Admission to the advanced-level respiratory therapy program and concurrent enrollment or completion of the advanced-level theory coursework.

Resp 341 (F, S, Summer) 1 hr. cr.  
**Research Issues, Methods, and Problems in Respiratory Care**

Directed research and discussion in selected areas of respiratory care for advanced-level respiratory therapist. Course work includes independent literature search under the supervision of a respiratory care instructor that utilizes the student's program acquired respiratory care critical thinking, writing, and oral presentation skills. Research scope, depth, and area of concentration to be approved by the program director. Prerequisite: Students must be in their final semester of the advanced-level program to enroll in this course.