



COLLEGE OF  
SCIENCE, ENGINEERING  
AND TECHNOLOGY

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# COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY

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**Dr. Richard Alo, Dean**

**Dr. Paul Tchounwou, Associate Dean**

**Dr. Wilbur Walters, Jr., Associate Dean**

**Mr. Craig Cassidy, Assistant Dean**

## **OFFICE: School of Engineering Building, Room 201**

The College of Science, Engineering, and Technology (CSET) was authorized in 2002, through an academic reorganization plan that combined the School of Science and Technology with the School of Engineering. The focal point of CSET's vision is the preparation of highly quality and competitive graduates. Academic programs help to fulfill this vision which is complemented by a faculty with a rich diversity of recognized scholars and scientists who have established reputations throughout the world. A capable and energetic administration, with a well-trained staff, is in place to provide the knowledge, support and experiences required to ensure and enhance productivity in the academic environment.

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## THE SCHOOL OF ENGINEERING

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### **DEPARTMENTS**

Civil and Environmental Engineering  
Computer and Telecommunications Engineering  
Electrical Engineering  
Computer Science

The School of Engineering offers Bachelor of Science Degrees in Civil Engineering, Computer Engineering, Telecommunications Engineering, and Computer Science. All B.S. degree programs are accredited by the Accreditation Board for Engineering and Technology (Engineering Accreditation Commission and Computer Science Accreditation Commission respectively).

### **GOALS**

The Engineering Program goals are as follows:

- I. Creating academic programs that prepare graduates: for entry into the practice of engineering, and contribution in the discipline or related areas and; with an awareness of the importance of continuing professional development and lifelong learning.
- II. Building academic programs that openly recruit and retain students with the goal of ethnic and social diversity.
- III. Engineering program development that seeks to blend the academic and pragmatic—to develop students with an empowered sense of their future.
- IV. Incorporation of the systems aspect of engineering practice into the engineering educational experience.
- V. Development of graduate and continuing engineering educational offerings that meet specific community needs.
- VI. Become actively involved in state-of-the-art research as well as state and regional economic development.

Engineering is a profession in which a knowledge of the mathematical and natural sciences, gained by study, experience, and practice, is applied to the efficient use of materials and the forces of nature. In fact, the term engineer properly means a person who has received professional training in pure and applied science. Before the middle of the 18th century, military experts assumed most engineering responsibilities, thereby diminishing the need for specialized private sector engineer training. Subsequent technical advances and societal changes have greatly broadened the field of engineering and introduced a civilian workforce to a large number of engineering specialties.

### **SCHOLARSHIPS AND FINANCIAL AID**

A variety of financial assistance programs are available through Enrollment Management at Jackson State University. For application information, please contact Undergraduate Admissions at (601) 979-0928.

In addition to the scholarship programs offered by the University, the School of Engineering offers scholarship awards to students who demonstrate promise as evidenced by exceptional high school academic performance (high school average of “B” or above) in college preparatory courses or outstanding achievement on the American College Test (ACT, 24 or above) or the Scholastic Aptitude Test (SAT, 1090 or above).

The amount of the award is based on demonstrated financial need. Students should apply for scholarships by the end of March prior to the subsequent Fall semester.

For application information, please contact: Jackson State University School of Engineering, P. O. Box 17249, Jackson, Mississippi 39217, or telephone us at (601) 601-979-4043.

The School offers the following scholarships:

1. School of Engineering Scholarship
2. Company-funded Scholarships
  - a. Neel-Scholarship
  - b. KWAME

These scholarships are renewable based on academic performance.

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## **DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**

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Dr. Farshad Amini, Professor and Chair

OFFICE: Engineering Building, Room 146

FACULTY:

Professors F. Amini, D. Leszczynska\*, R. Whalin; Associate Professors L. Li, Y. Li, W. Walters\*\*, W. Zheng; Assistant Professor H. Das, F. Wang

\*Joint appointment with the Environmental Science Program (Department of Biology)

\*\*Joint appointment with the Department of Physics, Atmospheric Sciences and Geosciences

Civil Engineering, the oldest and broadest of the divisions of engineering, implements a range of public and private projects for improving the world's environment. The civil engineer integrates scientific principles including modern computational tools with engineering experience to conceive, plan, design, construct, operate, and maintain facilities such as network of highways and railroads, airports, bridges, buildings, dams, tunnels, environmental pollution control systems, water purification and distribution systems and urban transportation systems that maintain, protect, and enhance the quality of life in our society. Civil Engineering is about community service, development and improvement, which includes the planning, design, construction, maintenance and operation of facilities essential to modern technological society, ranging from transit systems to offshore structures to space satellites. The civil engineering profession faces a great challenge as it assumes a central role in solution of the physical problems facing the urban environment. The Civil Engineering Program at Jackson State University is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. It is designed to prepare students for careers in civil engineering or to seek graduate study

### **MISSION**

The mission of the Department of Civil and Environmental Engineering is to achieve excellence in education, research, and public and professional service. The Department will:

1. Provide a forward-looking, learner-centered and intellectually stimulating civil engineering educational experience that inspires students to reach for the highest levels of intellectual attainment and growth throughout their lives;

2. Provide a scholarly and professional environment and make significant contributions to the advancement of knowledge in civil engineering; and,
3. Engage in meaningful service activities that enhance the public's understanding and perception of civil engineering issues for the betterment of society and particularly in an urban environment.

The Department will pursue its mission within an environment that embraces integrity, respect, trust, openness, fairness, performance, and accountability.

**PROGRAM EDUCATIONAL OBJECTIVES**

Graduates of JSU Civil Engineering Program are expected within a few years of graduation to have: Established themselves as professionals actively engaging in problem solving to address the needs of society.

1. Progressed in their civil engineering careers or other chosen professions and/or engaged in advanced studies in civil engineering or other related fields.
2. Demonstrated their ability to act professionally and ethically in making decisions and to practice life-long learning and continuing education.

**STUDENT OUTCOMES**

The JSU Civil Engineering graduates will have:

- Outcome A: an ability to apply knowledge of mathematics, science, and engineering.
- Outcome B: an ability to design and conduct civil engineering experiments, as well as to analyze and interpret data.
- Outcome C: an ability to design a civil engineering system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Outcome D: an ability to function on multi-disciplinary teams.
- Outcome E: an ability to identify, formulate, and solve civil engineering problems.
- Outcome F: an understanding of professional and ethical responsibility.
- Outcome G: an ability to communicate effectively.

Outcome H: the broad education necessary to understand the impact of civil engineering solutions in a global, economic, environmental, and societal contexts.

Outcome I: recognition of the need for, and an ability to engage in life-long learning.

Outcome J: a knowledge of contemporary issues necessary for engineering practice.

Outcome K: an ability to use the techniques, skills, and modern engineering tools.

**REQUIREMENTS FOR THE MAJOR:**

The Undergraduate Civil Engineering Program at JSU offers two concentrations in "General Civil Engineering" and "Environmental Engineering." The General Civil Engineering concentration is designed for students who desire a broad knowledge of the field of civil engineering. The Environmental Engineering concentration is intended for students who are more interested in Environmental Engineering as a career.

**(General Civil Engineering Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
MATH 231,232 Calculus I and II	4	4
ENG 104,105 Composition	3	3
HIST 101,102 History of Civilization	3	3
UNIV 100 University Success	2	
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
EN 105 Programming for Engineers		3
PHY 211 General Physics I		4
PHYL 211 General Physics I Lab		<u>1</u>
(Freshman Year Total: 34 Hours)	16	18

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
MATH 233 Calculus III	4	
PHY 212 General Physics II	4	
PHYL 212 General Physics II Lab	1	
ENG xxx English Option	3	
EN 222 Engineering Mechanics I	3	
SCI xxx Science Option	3	
MATH 368 Ordinary Diff. Equations I		3
EN 223 Engineering Mechanics II		3
SPCH xxx Speech Options		3
EN 220 Circuit Theory		3
EN 201 Engineering Graphics		2
EN 240 Strength of Materials		<u>3</u>
(Sophomore Year Total: 35 Hours)	18	17

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
CIV 330, CIVL 330 Fluid Mechanics & Lab	3	
MATH 307 Probability & Statistics for Engineers	3	
CIV 320 Structural Analysis	3	
CIV 340S, CIVL 340 Environmental Engineering & Lab	4	
PHIL xxx Philosophy Option	3	
CIV 360 Design of Steel Structures		2
EN 355 Engineering Economy		3
CIV 370 Water Resources Engineering		3
CIV 380 Intro to Geotechnical Engineering		3
CIVL 380 Geotechnical Engineering Lab		1
CIV 390 Intro to Transportation Engineering		3
(Junior Year Total: 31 Hours)	16	15

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CIV 410 Capstone Design I	3	
CIV xxx Civil Engineering Elective	3	
CIV xxx Civil Engineering Elective	3	
CIV 430 Foundation Engineering	3	
CIV 420 Design of Concrete Structures	2	
CIVL 421 Structural Engineering Lab	1	
CIV 411W Capstone Design II		3
CIV xxx Civil Engineering Elective		3
CIV xxx Civil Engineering Elective		3
ART xxx Fine Arts Option		3
CIV 461 Professional & Ethical Issues in Civil Engineering		1
(Senior Year Total: 28 Hours)	15	13

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**TOTAL HOURS:** **128**

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**Civil Engineering Technical Electives:**

CIV 310 Engineering Surveying
CIVL 310 Engineering Surveying Lab
CIV 431 Traffic Engineering
CIV 441 Water & Wastewater Treatment Processes
CIV 451 Computer Methods in Civil Engineering
CIV 460 Design of Environmental Engineering Facilities
CIV 465 Advanced Water Resources Engineering
CIV 466 Advanced Design of Hydraulic Structures
CIV 468 Hazardous Waste Engineering
CIV 470 Urban Transportation Engineering Sys. Design
CIV 471 Principles of Geoenvironmental Engineering
CIV 472 Applied Geotechnical Engineering Design
CIV 475 Pavement Design
CIV 476 Advanced Design of Steel Structures
CIV 477 Advanced Design of Concrete Structures
CIV 478 Design of Wood and Masonry Structures
CIV 479 Evaluation, Maintenance, and Rehabilitation of Public Works Infrastructure
CIV 481 Special Problems in Civil Engineering
CIV 491 Internships in Civil Engineering I
CIV 492 Internships in Civil Engineering II

The students are required to contact their advisors or department chair prior to taking any civil engineering elective.

1. At least one (1) civil engineering elective must be chosen from CIV 465 or CIV 466.
2. At least one (1) civil engineering elective must be chosen from CIV 441. Or CIV 460.
3. At least one engineering elective must be chosen from CIV 431, CIV 470, CIV 475, or CIV 479.

The students are required to contact their advisors or department chair prior to taking any civil engineering elective.

**Science Elective:**

BIO 101 & BIOL 101 Introduction to Biology and Lab  
SCI 205 Earth and Space Science

At least one science elective must be chosen from BIO 101 & BIOL 101 or SCI 205.

**DEVELOPMENTAL COURSE REQUIREMENTS:**

ENG 002	Required for students with an ACT English subtest score of 16 or less. Strongly encouraged for students with English subtest score of 19 or less.
MATH 004	Required for students with an ACT Mathematics subtest score of 16 or less. Strongly encouraged for students with Mathematics subtest score of 19 or less.
RE 002	Required for students with an ACT Reading subtest score of 16 or less. Strongly encouraged for students with Reading subtest score of 19 or less.
GNST 101, 102	Required for students taking two (2) or more intermediate courses. Students in the Academic Support Program will not be permitted to take more than 15 semester hours, including intermediate courses and the Academic Support Program.

**NOTE:** (a) Students who transfer 12 or more hours of college credit are exempt from UNIV 100; (b) Students are required to take the Mathematics Placement Test to determine if they need to take any mathematics courses before taking MATH 231-Calculus I; (c) Students who fail the English Proficiency Examination must register for ENG 399.

**SPEECH OPTIONS**

SPCH 201 Speech Arts  
 SPCH 334 Argumentation and Debate  
 SPCH 355 Persuasion  
 SPCH 430 Small Group Discussion

**PHILOSOPHY OPTIONS**

PHIL 208 Aesthetics  
 PHIL 301 Introduction to Philosophy  
 PHIL 309 Ethics  
 PHIL 416 Logic

**HUMANITIES AND FINE ARTS OPTIONS**

ART 206 Art Appreciation  
 MUS 205 Music Appreciation  
 DR 201 Introduction to Drama  
 ENG 201/202 Humanities  
 ENG 205 World Literature  
 FR 101/102 Elementary French \*  
 FR 201/202 Intermediate French \*  
 FR 213 French Phonetic Reading \*  
 SP 101/102 Elementary Spanish \*  
 SP 201/202 Intermediate Spanish \*

\*NOTE: Students may take the equivalent of any foreign language the University offers.

**ENGLISH OPTIONS**

ENG 205 World Literature  
 ENG 206 Literature of Science  
 ENG 213 Professional Writing

**Bachelor of Science: Civil Engineering Major  
 (Environmental Engineering Concentration)**

**FRESHMAN YEAR**

	<b>F</b>	<b>S</b>
MATH 231, 232 Calculus I and II	4	4
ENG 104, 105 Composition	3	3
HIST 101, 102 History of Civilization	3	3
UNIV 100 University Success	2	
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
EN 105 Programming for Engineers		3
PHY 211 General Physics I		4
PHYL 211 General Physics I Lab	_____	1
(Freshman Year Total: 34 Hours)	16	18

**SOPHOMORE YEAR**

	<b>F</b>	<b>S</b>
MATH 233 Calculus III	4	
CHEM 142 General Chemistry II	3	
CHML 142 General Chemistry II Lab	1	
ENG xxx English Option	3	
EN 222 Engineering Mechanics I	3	

SCI xxx Science Elective	3	
MATH 368 Ordinary Diff. Equations I		3
EN 223 Engineering Mechanics II		3
CHEM 241 Organic Chemistry I		3
CHML 241 Organic Chemistry I Lab		1
EN 220 Circuit Theory		3
EN 201 Engineering Graphics		2
EN 240 Strength of Materials		_____3
(Sophomore Year Total: 35 Hours)	17	18

**JUNIOR YEAR**

	<b>F</b>	<b>S</b>
CIV 330, CIVL 330 Fluid Mechanics & Lab	3	
MATH 307 Probability & Statistics for Engineers	3	
CIV 320 Structural Analysis	3	
CIV 340S, CIVL 340 Environmental Engineering & Lab		4
SPCH xxx Speech Option		3
CIV 360 Design of Steel Structures		2
EN 355 Engineering Economy		3
CIV 370 Water Resources Engineering		3
CIV 380 Intro to Geotechnical Engineering		3
CIVL 380 Geotechnical Engineering Lab		1
CIV 390 Intro to Transportation Engineering		_____3
(Junior Year Total: 31 Hours)	16	15

**SENIOR YEAR**

	<b>F</b>	<b>S</b>
CIV 410 Capstone Design I	3	
CIV xxx Civil Engineering Elective	3	
CIV xxx Civil Engineering Elective	3	
CIV 430 Foundation Engineering	3	
CIV 420 Design of Concrete Structures	2	
CIVL 421 Structural Engineering Lab		1
CIV 411W Capstone Design II		3
CIV xxx Civil Engineering Elective		3
ART xxx Fine Arts Option		3
PHIL xxx Philosophy Option		3
CIV 461 Professional and Ethical Issues in Civil Engineering		_____1
(Senior Year Total: 28 Hours)	15	13

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**TOTAL HOURS: 128**

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**Civil Engineering Technical Electives:**

CIV 310 Engineering Surveying	
CIVL 310 Engineering Surveying Lab	
CIV 431 Traffic Engineering	
CIV 441 Water & Wastewater Treatment Processes	
CIV 451 Computer Methods in Civil Engineering	
CIV 460 Design of Environmental Engineering Facilities	
CIV 465 Advanced Water Resources Engineering	
CIV 466 Advanced Design of Hydraulic Structures	
CIV 468 Hazardous Waste Engineering	
CIV 470 Urban Transportation Engineering Syst. Design	

CIV 471 Principles of Geoenvironmental Engineering  
 CIV 472 Applied Geotechnical Engineering Design  
 CIV 475 Pavement Design  
 CIV 476 Advanced Design of Steel Structures  
 CIV 477 Advanced Design of Concrete Structures  
 CIV 478 Design of Wood and Masonry Structures  
 CIV 479 Evaluation, Maintenance, and Rehabilitation  
 of Public Works Infrastructure  
 CIV 481 Special Problems in Civil Engineering  
 CIV 491 Internships in Civil Engineering I  
 CIV 492 Internships in Civil Engineering II

1. At least two (2) civil engineering electives must be chosen from CIV 441, CIV 460, CIV 468, or CIV 471.
2. At least one (1) civil engineering elective must be chosen from CIV 431, CIV 470, CIV 475, or CIV 479.

The students are required to contact their advisors or department chair prior to taking any civil engineering elective.

**Science Elective:**

BIO 101 & BIOL 101 Introduction to Biology and Lab  
 SCI 205 Earth and Space Science

A least one science elective must be chosen from BIO 101 & BIOL 101 or SCI 205.

**DEVELOPMENTAL COURSE REQUIREMENTS:**

ENG 002 Required for students with an ACT English subtest score of 16 or less. Strongly encouraged for students with English subtest score of 19 or less.

MATH 004 Required for students with an ACT Mathematics subtest score of 16 or less. Strongly encouraged for students with Mathematics subtest score of 19 or less.

RE 002 Required for students with an ACT Reading subtest score of 16 or less. Strongly encouraged for students with Reading subtest score of 19 or less.

GNST 101, 102 Required for students taking two (2) or more intermediate courses. Students in the Academic Support Program will not be permitted to take more than 15 semester hours, including intermediate courses and the Academic Support Program.

**NOTE:** (a) Students who transfer 12 or more hours

of college credit are exempt from UNIV 100; (b) Students are required to take the Mathematics Placement Test to determine if they need to take any mathematics courses before taking MATH 231-Calculus I; (c) Students who fail the English Proficiency Examination must register for ENG 399.

**SPEECH OPTIONS**

SPCH 201 Speech Arts  
 SPCH 300 Introduction to Organization Communication  
 SPCH 334 Argumentation and Debate  
 SPCH 355 Persuasion  
 SPCH 430 Small Group Discussion

**PHILOSOPHY OPTIONS**

PHIL 208 Aesthetics  
 PHIL 301 Introduction to Philosophy  
 PHIL 309 Ethics  
 PHIL 416 Logic

**HUMANITIES AND FINE ARTS OPTIONS**

ART 206 Art Appreciation  
 MUS 205 Music Appreciation  
 DR 201 Introduction to Drama  
 ENG 201/202 Humanities  
 ENG 205 World Literature  
 FR 101/102 Elementary French \*  
 FR 201/202 Intermediate French \*  
 FR 213 French Phonetic Reading \*  
 SP 101/102 Elementary Spanish \*  
 SP 201/202 Intermediate Spanish \*

\* NOTE: Students may take the equivalent of any foreign language the University offers.

**ENGLISH OPTIONS**

ENG 205 World Literature  
 ENG 206 Literature of Science  
 ENG 213 Professional Writing

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**DEPARTMENT OF COMPUTER AND  
TELECOMMUNICATIONS ENGINEERING**

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Dr. Mahmoud A. Manzoul, Professor and Chair

OFFICE: School of Engineering, Room 233

**FACULTY:**

Professors Kamal S. Ali, Gordon Skelton, Khalid Abed, and Shahrouz Aliabadi; Associate Professors Tarek El-Bawab, Shuanqzhang Tu and Abdelnasser Eldek; Instructor Mitchell Belser

The mission of the Computer Engineering Department is to build and sustain a high quality and broad-based teaching and research program in computer engineering, telecommunications engineering and electrical engineering, to prepare graduates for successful professional careers, and to provide service to the community.

The Department of Computer Engineering offers three undergraduate degrees: Bachelor of Science in Computer Engineering, Bachelor of Science in Telecommunications Engineering, and Bachelor of Science in Electrical Engineering.

**COMPUTER ENGINEERING**

**Program Educational Objectives**

Graduates of the program will be able to achieve the following three objectives within the first few years after graduation.

1. Employed in the computing profession with potential for successful career advancement.
2. For those with an interest in earning advanced degrees, they will have completed or be pursuing advanced degrees.
3. Be informed and involved members of their communities as well as professional organizations and engaged in life-long learning.

**Student Outcomes**

The computer engineering program attempts to instill the following outcomes in its graduates:

- a. An ability to apply knowledge of mathematics, science, and engineering to the analysis of computer engineering problems.
- b. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process

to meet desired needs.

- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate and solve computer engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. A broad education necessary to understand the impact of computer engineering solutions in a global, economic, environmental, and societal context.
- i. A recognition of the need for, and an ability to engage in, life-long learning.
- j. A knowledge of contemporary issues.
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- l. An ability to analyze, design, and implement software solutions.

**REQUIREMENTS FOR THE MAJOR:**

**Bachelor of Science: Computer Engineering Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
UNIV 100 University Success	2	
MATH 241 Calculus I	3	
CSC 118 Programming Fundamentals	3	
CSCL 118 Programming Fundamentals Lab	1	
HIST 101,102 History of Civilization	3	3
ENG 104,105 Composition	3	3
MATH 242 Calculus II		3
EN 212 Digital Logic		3
ENL 212 Digital Logic Lab		1
PHY 211 General Physics I		4
PHYL 211 General Physics I Lab		<u>1</u>
(Freshman Year Total: 31 Hours)	15	18

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
MATH 243 Calculus III	3	
PHY 212 General Physics II	4	
PHYL 212 General Physics II Lab	1	
CSC 119 Object-Oriented Programming	3	
CSCL 119 Object-Oriented Programming Lab	1	
EN 220 Circuit Theory	3	
ENL 220 Circuit Theory Lab	1	
EN 252 Engineering Analysis		3
CPE 312 Computer Organization		3
CSC 225 Discrete Structure		3
MATH 244 Calculus IV		3
CPE 330 Electronics		3
CPEL 330 Electronics Lab		<u>1</u>
(Sophomore Year Total: 32 Hours)	16	16



<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 368 Ordinary Differential Equation I	3	
EN 222 Engineering Mechanics	3	
CPE 360 Embedded Microprocessors	3	
CPEL 360 Embedded microprocessors Lab	1	
CPE 315 Synthesis with HDL	3	
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
MATH 307 Prob & Stat for Engineers		3
EN 355 Engineering Economy		3
CSC 228 Data Structures & Algorithms		3
CSCL 228 Data Structures & Algorithms Lab		1
CPE 351 Signals and Systems		3
CPE 412 Computer Architecture		3
ENG xxx English Option		<u>3</u>
(Junior Year Total: 36 Hours)	17	19

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CPE 490S Senior Design Project I	3	
CSC 325 Operating Systems	3	
PHIL xxx Philosophy Option	3	
ART xxx Fine Arts Option	3	
CPE xxx Technical Elective 1	3	
CPE 491W Senior Design Project II		3
SPCH xxx Speech Option		3
CPE xxx Technical Elective 2		3
CPE xxx Technical Elective 3		<u>3</u>
(Senior Year Total: 27 Hours)	15	12

**NOTE:** Grade "C" or better for all courses

<b>TOTAL HOURS:</b>	<b>128</b>
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**Technical Electives for Computer Engineering Majors:**

CPE 430 Digital VLSI Design	3
CPE 431 Digital Systems Testing	3
CPE 440 Communication Systems	3
CPE 441 Computer Networks	3
CPE 451 Digital Signal Processing	3
CPE 492 Special Studies in CPE	3
CPE 493 Special Topics in CPE	3

Other Courses require Chair's approval.

**TELECOMMUNICATIONS ENGINEERING OBJECTIVES**

**Program Educational Objectives**

Graduates of the program will be able to achieve the following three objectives within the first few years after graduation.

1. Employed in the telecommunication profession with potential for successful career advancement.
2. For those with an interest in earning advanced degrees, they will have completed or be pursuing advanced degrees.
3. Be informed and involved members of their communities as well as professional organizations and engaged in life-long learning.

**STUDENT OUTCOMES**

The telecommunications engineering program attempts to instill the following outcomes in its graduates:

- a. An ability to apply knowledge of mathematics, science, and engineering to the analysis of telecommunications engineering problems.
- b. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs.
- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate and solve telecommunications engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. A broad education necessary to understand the impact of telecommunications engineering solutions in a global, economics, environmental, and societal context.
- i. A recognition of the need for, and an ability to engage in, life-long learning.
- j. A knowledge of contemporary issues.
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**REQUIREMENTS FOR THE MAJOR:**

**Bachelor of Science:**

**Telecommunications Engineering Majors**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
UNIV 100 University Success	2	
MATH 241 Calculus I	3	
CSC 118 Programming Fundamentals	3	
CSCL 118 Programming Fundamentals Lab	1	
HIST 101,102 History of Civilization	3	3
ENG 104,105 Composition	3	3
MATH 242 Calculus II		3
EN 212 Digital Logic		3
ENL 212 Digital Logic Lab		1
PHY 211 General Physics I		4
PHYL 211 General Physics I Lab		<u>1</u>
(Freshman Year Total: 33 Hours)	15	18

<b>SOPHOMORE YEAR</b>		<b>F</b>	<b>S</b>
MATH 243 Calculus III	3		
PHY 212 General Physics II	4		
PHYL 212 General Physics II Lab	1		
CSC 119 Object-Oriented Programming	3		
CSCL 119 Object-Oriented Programming Lab	1		
EN 220 Circuit Theory	3		
ENL 220 Circuit Theory Lab	1		
EN 252 Engineering Analysis		3	
CPE 312 Computer Organization		3	
CHEM 141 General Chemistry I		3	
CHML 141 General Chemistry Lab I		1	
MATH 244 Calculus IV		3	
CPE 330 Electronics		3	
CPEL 330 Electronics Lab			1
(Sophomore Year Total: 33 Hours)	16	17	

<b>JUNIOR YEAR</b>		<b>F</b>	<b>S</b>
MATH 368 Ordinary Differential Equation I	3		
EN 222 Engineering Mechanics	3		
CPE 345 Electromagnetics	3		
CPE 351 Signals and Systems	3		
CPE 360 Embedded Microprocessors	3		
CPEL 360 Embedded microprocessors Lab	1		
CPE 441 Computer Networks	3		
MATH 307 Prob & Stat for Engineers		3	
CPE 445 Applied Electromagnetics		3	
EN 355 Engineering Economy		3	
ENG xxx English Option		3	
SPCH xxx Speech Option			3
(Junior Year Total: 34 Hours)	19	15	

<b>SENIOR YEAR</b>		<b>F</b>	<b>S</b>
CPE 440 Communication Systems	3		
CPE 490S Senior Design Project I	3		
CPE xxx Technical Elective 1	3		
PHIL xxx Philosophy Option	3		
ART xxx Fine Arts Option	3		
CPE 442 Digital Communications		3	
CPEL 442 Digital Communications Lab		1	
CPE 446 Wireless Communications		3	
CPE 491W Senior Design Project II		3	
CPE xxx Technical Elective 2			3
(Senior Year Total: 28 Hours)	15	13	

**NOTE:** Grade "C" or better for all courses

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**TOTAL HOURS:** **128**

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**Technical Electives for Telecommunications**

**Engineering Majors:**

CPE 451 Digital Signal Processing	3
CPE 412 Computer Architecture	3
CPE 447 Telecom Switching and Trans.	3

CPE 355 Control Systems	3
CPE 492 Special Studies in CPE	3
CPE 493 Special Topics in CPE	3

Other Courses require Chair's approval.

**ELECTRICAL ENGINEERING**

**Program Educational Objectives**

Graduates of the program will be able to achieve the following three objectives within the first few years after graduation.

1. Employed in the electrical engineering profession with potential for successful career advancement.
2. For those with an interest in earning advanced degrees, they will have completed or be pursuing advanced degrees.
3. Be informed and involved members of their communities as well as professional organizations and engaged in life-long learning.

**STUDENT OUTCOMES**

The electrical engineering program attempts to instill the following outcomes in its graduates:

- a. An ability to apply knowledge of mathematics, science, and engineering to the analysis of electrical engineering problems.
- b. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs.
- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate and solve electrical engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. A broad education necessary to understand the impact of electrical engineering solutions in a global, economic, environmental, and societal context.
- i. A recognition of the need for, and an ability to engage in, life-long learning.
- j. A knowledge of contemporary issues.
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**REQUIREMENTS FOR THE MAJOR:**  
**Bachelor of Science: Electrical Engineering Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
UNIV 100 University Success	2	
MATH 241 Calculus I	3	
CSC 118 Programming Fundamentals	3	
CSCL 118 Programming Fundamentals Lab	1	
HIST 101,102 History of Civilization	3	3
ENG 104,105 Composition	3	3
MATH 242 Calculus II		3
EN 212 Digital Logic		3
ENL 212 Digital Logic Lab		1
PHY 211 General Physics I		4
PHYL 211 General Physics I Lab		<u>1</u>
(Freshman Year Total: 33 Hours)	15	18

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
MATH 243 Calculus III	3	
PHY 212 General Physics II	4	
PHYL 212 General Physics II Lab	1	
CSC 119 Object-Oriented Programming	3	
CSCL 119 Object-Oriented Programming Lab	1	
EN 220 Circuit Theory	3	
ENL 220 Circuit Theory Lab	1	
EN 252 Engineering Analysis		3
CPE 312 Computer Organization		3
CHEM 141 General Chemistry I		3
CHML 141 General Chemistry Lab I		1
MATH 244 Calculus IV		3
CPE 330 Electronics		3
CPEL 330 Electronics Lab		<u>1</u>
(Sophomore Year Total: 33 Hours)	16	17

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 368 Ordinary Differential Equation I	3	
CPE 320 Circuits Theory II	3	
CPE 335 Semiconductor Devices	3	
CPE 345 Electromagnetics	3	
CPE 351 Signals and Systems	3	
CPE 360 Embedded Microprocessors	3	
CPEL 360 Embedded microprocessors Lab	1	
MATH 307 Prob & Stat for Engineers		3
CPE 355 Control Systems		3
CPE 331 Electronics II		3
CPEL 331 Electronics II Lab		1
EN 355 Engineering Economy		3
ENG xxx English Option		<u>3</u>
(Junior Year Total: 35 Hours)	19	16

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CPE 440 Communication Systems	3	
CPE 490S Senior Design Project I	3	
CPE xxx Technical Elective 1	3	

PHIL xxx Philosophy Option	3
ART xxx Fine Arts Option	3
CPE 491W Senior Design Project II	3
CPE xxx Technical Elective 2	3
CPE xxx Technical Elective 3	3
SPCH xxx Speech Option	<u>3</u>
(Senior Year Total: 27 Hours)	15 12

NOTE: Grade "C" or better for all courses

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**TOTAL HOURS: 128**

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**Technical Electives for Electrical Engineering Majors:**

**POWER SYSTEMS TRACK ELECTIVES:**

CPE 435 Power Electronics	3
CPE 480 Power Systems	3
CPE 481 Electric Drives	3

**BIOMEDICAL ENGINEERING TRACK ELECTIVES:**

CPE 470 Biomedical Instrumentations	3
CPE 471 Biomedical Signal Processing	3
CPE 472 Biomedical Materials	3

**GENERAL ELECTRICAL ENGINEERING ELECTIVES:**

CPE 430 Digital VLSI Design	3
CPE 431 Digital Systems Testing	3
CPE 435 Power Electronics	3
CPE 442 Digital Communications	3
CPE 445 Applied Electromagnetics	3
CPE 446 Wireless Communications	3
CPE 470 Biomedical Instrumentations	3
CPE 471 Biomedical Signal Processing	3
CPE 472 Biomedical Materials	3
CPE 480 Power Systems	3
CPE 481 Electric Drives	3

Other Courses require Chair's approval.

**SPEECH OPTIONS:**

SPCH 201 Speech Arts
SPCH 300 Intro to Organizational Communication
SPCH 334 Argumentation and Debate
SPCH 355 Persuasion
SPCH 430 Small Group Discussion

**PHILOSOPHY OPTIONS:**

PHIL 308 Aesthetics
PHIL 301 Introduction to Philosophy
PHIL 309 Ethics
PHIL 416 Logic

**ART AND HUMANITIES OPTIONS:**

ART 206 Art Appreciation  
 DR 201 Introduction to Drama  
 ENG 201,202 Humanities  
 ENG 205 World Literature  
 FR 101,102 Elementary French  
 FR 201,202 Intermediate French  
 FR 213 French Phonetic Reading  
 MUS 205 Music Appreciation  
 SP 101,102 Elementary Spanish  
 SP 201,202 Intermediate Spanish

**ENGLISH OPTIONS:**

ENG 205 World Literature  
 ENG 206 Literature of Science  
 ENG 213 Professional Writing

- NOTE:** (a) Students who transfer 12 or more hours of college credit are exempt from UNIV 100
- (b) Students are required to take the Mathematics Placement Test to determine if they need to take any mathematics courses before taking MATH 231–Calculus I
- (c) Students who fail the English Proficiency Examination must register for ENG 399.

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**DEPARTMENT OF COMPUTER SCIENCE**


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Dr. Gordon Skelton, Professor and Interim Chair  
 OFFICE: John A. Peoples Science Building, Office 237  
 FACULTY:  
 Professor L. Moore; Associate Professors W. Brown, A. El Humos, H. Kim, J. Jackson, X. Liang, N. Meghanathan, T. Pei; Assistant Professors A. Abu El Humos, S. Hong, J. Jackson, G. Offiah, A. Tanner; Instructors V. Bailey, F. Dancer, E. Dillion, C. Richards-Jordan

The undergraduate major in Computer Science is intended to enable a student to pursue further studies in Computer Science or in related fields of Science, Engineering, and Business and to enter the work force as an entry level computer professional. The program combines a very thorough preparation in the fundamentals of Computer Science and related fields with the opportunity for more advanced work in either Computer Science or Computer Engineering.

**OBJECTIVES**

The educational objectives of the Computer Science

undergraduate program at Jackson State University are to graduate students with:

1. An understanding of and the ability to apply the core principles and theories of Computer Science.
2. The motivation and preparation to engage in life-long learning, including entering graduate programs in Computer Science and related fields.
3. The professional skills needed for employment, while being able to adapt to rapidly changing technology.
4. An understanding of the ethical responsibilities of a computer professional and the social impact of computing.

**STUDENT OUTCOMES**

Each student who graduates from the Undergraduate Program in Computer Science will be able to:

- a. Apply knowledge of computing and mathematics appropriate to the discipline.
- b. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
- c. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- d. Function effectively on teams to accomplish a common goal.
- e. Understand professional, ethical, legal, security, and social issues and responsibilities.
- f. Communicate effectively with a range of audiences.
- g. Analyze the local and global impact of computing on individuals, organizations, and society.
- h. Recognize the need for and an ability to engage in continuing professional development.
- i. Use current techniques, skills, and tools necessary for computing practice.
- j. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- k. Apply design and development principles in the construction of software systems of varying complexity.

**REQUIREMENTS FOR THE MAJOR:**  
**Bachelor of Science: Computer Science Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
CSC 118 Programming Fundamentals	3	
CSCL 118 Programming Fundamentals Lab	1	
CSC 119 Object-Oriented Programming		3
CSCL 119 Object-Oriented Programming Lab		1
CSC 225 Discrete Structures		3
ENG 104, 105 Composition	3	3
UNIV 100 University Success	2	
HIST 101, 102 History of Civilization	3	3
MATH 231 Calculus I with Lab	4	
MATH 232 Calculus II with Lab		4
PE xxx 100-Level Activity Sport	1	1
(Freshman Year Total: 35 Hours)	17	18

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 101 Introduction to Biology	2	
BIOL 101 Introduction to Biology Lab	1	
CHEM 141 General Chemistry I		3
CHML 141 General Chemistry I Lab		1
CSC 216 Computer Architecture & Org.		3
CSCL 216 Computer Architecture & Org. Lab		1
CSC 228 Data Structures & Algorithms	3	
CSCL 228 Data Structures & Algorithms Lab	1	
CSC 2xx Programming Language Elective		3
EN 212 Digital Logic	3	
ENL 212 Digital Logic Lab	1	
ENG 205 World Literature	3	
ENG 213 Professional Writing		3
MATH 233 Calculus III with Lab	4	
MATH 307 Probability&Statistics for Engineers		3
(Sophomore Year Total: 35 Hours)	18	17

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
CSC 312 Advanced Computer Architecture		3
CSC 323 Algorithm Design & Analysis	3	
CSC 325 Operating Systems	3	
CSC 330 Database Systems	3	
CSC 350 Organization of Programming Lang.		3
MFL 101, 102 Modern Foreign Language	3	3
PHY 211 General Physics I	4	
PHYL 211 General Physics I Lab	1	
PHY 212 General Physics II		4
PHYL 212 General Physics II Lab		1
SPCH 201 Speech Arts		3
(Junior Year Total: 34 Hours)	17	17

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CSC 435 Computer Networks	3	
CSC 441 Computers and Society (W)	3	
CSC 475 Software Engineering	3	

CSC 450 Senior Project (W)	3
CSC 4xx Computer Science Elective	3
PHIL 301 Introduction to Philosophy	3
Humanities & Fine Arts Option	3
Social Science Option	3
(Senior Year Total: 24 Hours)	12 12

**TOTAL HOURS: 128**

**NOTE:** (1) Students with an ACT English subtest score of 16 or less or who score below 340 (verbal) on the SAT must take ENG 002.

(2) Students with an ACT Mathematics subtest score of 16 or less or who score below 370 (Math) on the SAT must take MATH 004.

(3) Students with an ACT Reading subtest score of 16 or less must take RE 002.

(4) Students may need Pre-Calculus courses if indicated by math assessment score.

(5) Students with no computer exposure must take CSC 115.

(6) Laboratory courses must be taken during the same semester as lecture for Computer Science, Engineering, Mathematics, Biology, Chemistry, and Physics courses.

(7) Students must satisfactorily pass the English Proficiency Examination.

(8) Students must take two semesters of the same foreign language courses. Those students who have two years of the same high school foreign language courses and "C" or better grades in these are exempt from the foreign language requirement.

(9) Students must take the ETS Major Field Examination in Computer Science.

(10) A minimum grade of "C" is required in all Computer Science Courses. Prerequisite courses must be successfully completed before taking the next courses.

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# THE SCHOOL OF SCIENCE AND TECHNOLOGY

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## DEPARTMENTS

Aerospace Studies  
Biology  
Chemistry  
Mathematics  
Physics, Atmospheric Sciences and General Science  
Technology

The School of Science and Technology resulted from a merger of the School of Industrial and Technical Studies and the Division of Natural Sciences, previously in the School of Liberal Studies. This reorganization was authorized July 1, 1983, for the purpose of consolidating the scientific and technical resources of the University into an efficiently focused endeavor capable of meeting the demands of the new technology.

The departments comprising the School of Science and Technology are: (1) Department of Aerospace Studies, (2) Department of Biology; (3) Department of Chemistry, (4) Department of Mathematics, (5) Department of Physics, Atmospheric Sciences and General Sciences, and (6) Department of Technology. The School offers 23 degree programs in its various areas leading to the B.S., B.S.E., M.S., M.S.T., Ed.S., and Ph.D. degrees. Additionally, Preprofessional programs (e.g., medicine) can be completed with the B.S. degree in some departments.

Active research programs in all departments are consistently maintained. The School of Science and Technology is also actively involved in a number of cooperative external programs with national and international institutions designed to enhance student and faculty development. The cooperative programs serve to broaden faculty and student exposure as well as give national and international visibility to Jackson State University.

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## DEPARTMENT OF AEROSPACE STUDIES

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Lt. Colonel Kevin C. Wilson, Professor and Chair

Office: Jackson State University, AFROTC Building  
(Faculty Apartments, Suite 25) 1400 John R. Lynch St,  
Jackson, MS 39217

FACULTY: Capt LaTracia Price, Capt Jonathan  
Stinson

### OBJECTIVES

The Aerospace Studies Program provides an opportunity for students to earn a commission in the United States Air Force while working toward an academic degree simultaneously. Skills that are the cornerstone of leadership excellence such as confidence, self-esteem, motivation, leadership and fellowship, creative thinking, self-discipline, team building, and decision-making are taught in the Air Force Reserve Officers Training Corps (AFROTC) Program.

Upon completing the AFROTC Program and all requirements for an academic degree, students can achieve their goal of a degree in their chosen academic field

and a presidential commission as an Air Force Second Lieutenant. The objectives of the program are:

- To produce the future officer leadership of the U.S. Air Force.
- To provide an introduction to the Air Force Reserve Officers Training Corps and the Air Force...how they're organized, how they work.
- To provide first-year cadets an informative and motivational program designed to recruit, retain, and familiarize them with the Air Force way of life and foster leadership, followership, teamwork, and esprit de corps.
- To provide cadets returning from field training sufficient opportunities to demonstrate and develop the leadership and management skills needed to successfully function as an active duty officer.
- To provide cadets to be commissioned additional opportunities to demonstrate and develop the leadership and management skills needed to successfully function as an active duty officer and

to adequately prepare them to transition from the ROTC environment to active duty.

The topics covered include the history and structure of the US Air Force, the Air Force's capabilities, career opportunities, benefits, Air Force installations, core values, leadership, managing diversity, teambuilding, communications skills, general aspects of air and space power through a historical perspective, the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. A separate Leadership Laboratory is a mandatory requirement for all cadets.

The Air Force ROTC Program is divided into the General Military Course (GMC) during the freshman and sophomore years and the Professional Officer Course (POC) for the remaining two years of college. Four-year cadets participate in a four-week training period during the summer between their sophomore and junior years.

### Aerospace Studies

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
AS 101 Fndtns of the U.S. Air Force I	1	
ASL 101 Leadership Laboratory	1	
AS 102 Fndtns of the U.S. Air Force II		1
ASL 102 Leadership Laboratory		<u>1</u>
(Freshman Year Total: 4 Hours)	2	2

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
AS 201 Evolutn of USAF Air&Space Power	1	
ASL 201 Leadership Laboratory	1	
AS 202 Evolutn of USAF Air&Space Power		1
ASL 202 Leadership Laboratory		<u>1</u>
(Sophomore Year Total: 4 Hours)	2	2

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
AS 301 Air Force Leadership Studies	3	
ASL 301 Leadership Laboratory	1	
AS 302 Air Force Leadership Studies		3
ASL 302 Leadership Laboratory		<u>1</u>
(Junior Year Total: 8 Hours)	4	4

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
AS 401 National Security Affairs & Preparation For Active Duty	3	
ASL 401 Leadership Laboratory	1	
AS 402 National Security Affairs & Preparation for Active Duty		3
ASL 402 Leadership Laboratory		<u>1</u>
(Senior Year Total: 8 Hours)	4	4

<b>TOTAL HOURS</b>	<b>24</b>	
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## DEPARTMENT OF BIOLOGY

Dr. Gregorio Begonia, Professor and Chair

OFFICE: John A. Peoples Science Building, Room 335

FACULTY:

Professors H. Ahmad, G. Begonia, M. Begonia, J. Cameron, S. Ekunwe, I. Farah, H. Hwang, P. Tchounwou; Associate Professors C. Buckley, H. Cohly, B. Graham, C. Howard, R. Isokpehi, R. Kafoury, K. Ndebele, J. Stevens, D. Sutton; Assistant Professors W. Ayensu, P. Dash, Y. Kim, G. Miller, A. Patlolla, C. Yedjou; Instructors: S. Cook, L. Drummond

### OBJECTIVES

The objectives of the Department of Biology are as follows:

- To develop the students' understanding of the basic biological principles.
- To help students think logically and communicate clearly.
- To help students become conscious of social problems especially those relevant to the life sciences.
- To prepare students for careers in the life sciences, teaching, and graduate studies.
- To provide a strong pre-professional foundation for medicine, dentistry, veterinary medicine, pharmacy, optometry, physical therapy, dental hygiene, medical technology, nursing and medical records administration.
- To engage in basic and applied research that benefits the local and scientific community;
- To offer introductory biology courses to non-biology major in order to fulfill their general education requirements.

### The Bennye Simmons Henderson Biology Book Award

The purpose of this award is to purchase Biology textbooks. This award of \$250 is only for Biology majors who are full-time students with sophomore or junior status with at least a 2.8 G.P.A. This award is given once each semester.

### Biology Minor Requirements

A minor in Biology requires at least 20 credit hours of Biology courses (BIO & BIOL). BIO 101 and BIOL 101 cannot be used toward the 20 credit hours. Required Courses (16 HOURS)

- BIO 111 GENERAL BIOLOGY I
- BIOL 111 GENERAL BIOLOGY I LAB
- BIO 112 GENERAL BIOLOGY II
- BIOL 112 GENERAL BIOLOGY II LAB
- 8 HOURS OF 300 LEVEL OR HIGHER BIO OR BIOL COURSES

**Elective Courses (4 or more hours)**

- Students may choose any BIO or BIOL course to satisfy the remaining 4 hours needed. BIO 101 and BIOL 101 cannot be used.

All coursework must be completed with grades of “C” or better.

**Bachelor of Science: Biology Major  
(Pre-Medicine, Pre-Veterinary, Pre-Dentistry or Pre-Optometry Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
BIO 111 General Biology I	3	
BIOL 111 General Biology I Lab	1	
BIO 112 General Biology II		3
BIOL 112 General Biology II Lab		1
BIO 114 Intro to Marine/Env. Science		2
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
CHEM 142 General Chemistry II		3
CHML 142 General Chemistry II Lab		1
MATH 111 College Algebra	3	
MATH 112 Trigonometry		3
ENG 104 Composition and Literature I	3	
ENG 105 Composition and Literature II		3
UNIV 100 a University Success	2	
(Freshman Year Total: 32 Hours)	16	16

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 115 General Zoology	3	
BIOL 115 General Zoology Lab	1	
BIO 119 General Botany		3
BIOL 119 General Botany Lab		1
CHEM 241 Organic Chemistry I	3	
CHML 241 Organic Chemistry I Lab	1	
CHEM 242 Organic Chemistry II		3
CHML 242 Organic Chemistry II Lab		1
MATH 241 Calculus I	3	
ENG 205 World Literature	3	
ART xxxb Fine Arts Option		3
SPCH xxxc Speech Option		3
(Sophomore Year Total: 28 Hours)	14	14

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 318 W Introduction to Genetics		3
BIOL 318 Introduction to Genetics Lab		1
BIO 392 S Independent Study	2	
BIO 390 W Seminar in Biology		1
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
PHY 202 Basic Physics II		3
PHYL 202 Basic Physics II Lab		1
PE xxxd Physical Education Option	1	
PE xxxd Physical Education Option		1

MFL xxxe Modern Foreign Language I	3	
MFL xxxe Modern Foreign Language II		3
HIST 101 History of Civilization I	3	
HIST 102 History of Civilization II		3
CSC 115 Digital Computer Principles	3	
(Junior Year Total: 32 Hours)	16	16

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 313 Introduction to Microbiology	3	
BIOL 313 Introduction to Microbiology Lab	1	
BIO 440 Cell Biology		3
BIOL 440 Cell Biology Lab		1
BIO 470 Human Physiology	3	
BIOL 470 Human Physiology Lab	1	
PSY 201 General Psychology	3	
SS xxxf Social Science Option		3
PHIL xxxg Philosophy Option		3
BIO xxxh Biology Electives	4	4
ELEC xxxi General Electives		3
(Senior Year Total: 32 Hours)	15	17

**TOTAL HOURS 124**

- Students earning a sub score less than 17 in English on the ACT (or the corresponding score on the SAT) will be placed in ENG 002.
- Students earning a sub score less than 17 in Mathematics on the ACT (or the corresponding score on the SAT) will be placed in MATH 004.
- Students earning a sub score less than 17 in Reading on the ACT (or the corresponding score on the SAT) will be placed in RE 002.
- All students must take the Undergraduate English Proficiency Exam (UEPE) after the sophomore year. Students not passing the exam must take ENG 399, Functional Writing.

**CORE OPTIONS**

- Students who transfer 12 or more hours of college credit are exempt from UNIV 100.
- ART 206, MUS 205, DR 201, ENG 201, or ENG 202 may be taken.
- SPCH 201, 216, 334, 335, or 430 may be taken.
- HE 101 (3 credit hours) may be taken in place of PE xxx (1 credit hour) and PE xxx (1 credit hour).
- Students who have completed two years of a single foreign language in high school with grades of “C” or better are exempt from the foreign language requirements. This



exemption must be listed on your JSU transcript. The six credit hours must be replaced with other courses.

- f. SS 201, SS 202, GEO 105, GEO 209, SOC 214, SOC 325, PS 334, PS 335, PS 336, ECO 211, ECO 212, PSY 111 or PSY 112 may be taken.
- g. PHIL 301, 308, 309 or 416 may be taken.
- h. BIO 202, 234, 235, 236, 380, 391, 393, 409, 423, 425, 430, 441, 443, 450, 475, 476 or 491 may be taken. Other courses may be taken with approval of the department Chair.
- i. Students may not take Biology, Math, Chemistry or Physics for a general elective.

**NOTE:** Laboratory courses must be taken during the same semester as lecture for biology, chemistry, and physics courses unless approved by the department chair.

**Bachelor of Science: Biology Major  
(Pre-Physical Therapy Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
BIO 111 General Biology I	3	
BIOL 111 General Biology I Lab	1	
BIO 112 General Biology II		3
BIOL 112 General Biology II Lab		1
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
CHEM 142 General Chemistry II		3
CHML 142 General Chemistry II Lab		1
MATH 111 College Algebra	3	
MATH 112 Trigonometry		3
ENG 104 Composition and Literature I	3	
ENG 105 Composition and Literature II		3
UNIV 100 a University Success	2	
(Freshman Year Total: 30 Hours)	16	14

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 115 General Zoology		3
BIOL 115 General Zoology Lab		1
BIO 119 General Botany	3	
BIOL 119 General Botany Lab	1	
CHEM 241 Organic Chemistry I	3	
CHML 241 Organic Chemistry I Lab	1	
CHEM 242 Organic Chemistry II		3
CHML 242 Organic Chemistry II Lab		1
MATH 241 Calculus I	3	
ENG 205 World Literature	3	
PSY 201 General Psychology	3	
ART xxxb Fine Arts Option		3
SPCH xxxc Speech Option		3
(Sophomore Year Total: 31 Hours)	17	14

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 318 W Introduction to Genetics	3	
BIOL 318 Introduction to Genetics Lab	1	
BIO 392 S Independent Study		2
BIO 390 W Seminar in Biology	1	
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
PHY 202 Basic Physics II		3
PHYL 202 Basic Physics II Lab		1
PE xxxe Physical Education Option	1	
PE xxxe Physical Education Option		1
MFL xxxf Modern Foreign Language I	3	
MFL xxxf Modern Foreign Language II		3
HIST 101 History of Civilization I	3	
HIST 102 History of Civilization II		3
PHIL xxxg Philosophy Option		3
(Junior Year Total: 32 Hours)	16	16

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 234 Human Anatomy & Physiology I	3	
BIOL 234 Human Anatomy & Physiology I Lab	1	
BIO 235 Human Anatomy & Physiology II		3
BIO L 235 Human Anatomy & Physiology II Lab		1
BIO 313 Introduction to Microbiology	3	
BIOL 313 Introduction to Microbiology Lab	1	
CSC 115 Digital Computer Principles	3	
PSY 214 Developmental Psychology	3	
PSY 216 Abnormal Psychology		3
SOC 214 Introduction to Sociology		3
STATS xxxd Statistics Elective		3
ELEC xxxh General Elective		4
(Senior Year Total: 31 Hours)	14	17

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**TOTAL HOURS** **124**

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- Students earning a sub score less than 17 in English on the ACT (or the corresponding score on the SAT) will be placed in ENG 002.
- Students earning a sub score less than 17 in Mathematics on the ACT (or the corresponding score on the SAT) will be placed in MATH 004.
- Students earning a sub score less than 17 in Reading on the ACT (or the corresponding score on the SAT) will be placed in RE 002.
- All students must take the Undergraduate English Proficiency Exam (UEPE) after the sophomore year. Students not passing the exam must take ENG 399, Functional Writing.

**CORE OPTIONS**

- a. Students who transfer 12 or more hours of college credit are exempt from UNIV 100.
- b. ART 206, MUS 205, DR 201, ENG 201 or ENG 202 may be taken.
- c. SPCH 201, 216, 334, 335 or 430 may be taken.
- d. BIO 202, ECO 359, MATH 271, or PSY 211 may be taken depending on Professional School requirements.
- e. HE 101 (3 credit hours) may be taken in place of PE xxx (1 credit hour) and PE xxx (1 credit hour).
- f. Students who have completed two years of a single foreign language in high school with grades of "C" or better are exempt from the foreign language requirements. This exemption must be listed on your JSU transcript. The six credit hours must be replaced with other courses.
- g. PHIL 301, 308, 309 or 416 may be taken.
- h. Students may not take Biology, Math, Chemistry or Physics for a general elective.

**NOTE:** Laboratory courses must be taken during the same semester as lecture for biology, chemistry and physics courses unless approved by the department chair.

**OTHER PREREQUISITE REQUIREMENTS**

Provide evidence of observation in a minimum of two physical therapy clinical departments or practices for a total of 40 hours (additional hours and sites recommended).

**CLINICAL TRAINING (2 YEARS)**

An additional two (2) years of clinical training is required for the M.S. degree in Physical Therapy at an accredited health professional school.

**Bachelor of Science: Biology Major  
(Pre-Pharmacy Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
BIO 111 General Biology I	3	
BIOL 111 General Biology I Lab	1	
BIO 112 General Biology II		3
BIOL 112 General Biology II Lab		1
BIO 114 Intro to Marine/Env. Science		2
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
CHEM 142 General Chemistry II		3
CHML 142 General Chemistry II Lab		1
MATH 111 College Algebra	3	

MATH 112 Trigonometry		3
ENG 104 Composition and Literature I	3	
ENG 105 Composition and Literature II		3
UNIV 100 a University Success		<u>2</u>
(Freshman Year Total: 32 Hours)	16	16

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 119 General Botany	3	
BIOL 119 General Botany Lab	1	
BIO 234 Human Anatomy & Physiology I	3	
BIOL 234 Human Anatomy & Physiology I Lab	1	
BIOL 235 Human Anatomy & Physiology II		3
BIOL 235 Human Anatomy & Physiology II Lab		1
CHEM 241 Organic Chemistry I	3	
CHML 241 Organic Chemistry I Lab	1	
CHEM 242 Organic Chemistry II		3
CHML 242 Organic Chemistry II Lab		1
MATH 241 Calculus I		3
ENG 205 World Literature	3	
ART xxxb Fine Arts Option		<u>3</u>
(Sophomore Year Total: 29 Hours)	15	14

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 313 Introduction to Microbiology	3	
BIOL 313 Introduction to Microbiology Lab	1	
BIO 318 W Introduction to Genetics		3
BIOL 318 Introduction to Genetics Lab		1
BIO 392 S Independent Study		2
BIO 390 W Seminar in Biology	1	
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
PHY 202 Basic Physics II		3
PHYL 202 Basic Physics II Lab		1
MFL xxxc Modern Foreign Language I	3	
MFL xxxc Modern Foreign Language II		3
HIST 101 History of Civilization I	3	
HIST 102 History of Civilization II		3
STATS xxxd Statistics Elective		<u>3</u>
(Junior Year Total: 34 Hours)	18	16

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 440 Cell Biology	3	
BIOL 440 Cell Biology Lab	1	
PE xxxe Physical Education Option	1	
PE xxxe Physical Education Option		1
CSC 115 Digital Computer Principles	3	
PHIL xxxf Philosophy Option		3 SS
xxxg Social Science Option		3
SPCH xxxh Speech Option	3	
ECO xxxi Economics Oprion		3
BIO xxxj Biology Electives		<u>4</u> <u>4</u>
(Senior Year Total: 29 Hours)	15	14

<b>TOTAL HOURS</b>	<b>124</b>
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- Students earning a sub score less than 17 in English on the ACT (or the corresponding score on the SAT) will be placed in ENG 002.
- Students earning a sub score less than 17 in Mathematics on the ACT (or the corresponding score on the SAT) will be placed in MATH 004.
- Students earning a sub score less than 17 in Reading on the ACT (or the corresponding score on the SAT) will be placed in RE 002.
- All students must take the Undergraduate English Proficiency Exam (UEPE) after the sophomore year. Students not passing the exam must take ENG 399, Functional Writing.

### CORE OPTIONS

- Students who transfer 12 or more hours of college credit are exempt from UNIV 100.
- ART 206, MUS 205, DR 201, ENG 201 or ENG 202 may be taken.
- Students who have completed two years of a single foreign language in high school with grades of “C” or better are exempt from the foreign language requirements. This exemption must be listed on your JSU transcript. The six credit hours must be replaced with other courses.
- BIO 202 or MATH 271 may be taken.
- HE 101 (3 credit hours) may be taken in place of PE xxx (1 credit hour) and PE xxx (1 credit hour).
- PHIL 301, 308, 309 or 416 may be taken.
- SS 201, SS 202, GEO 105, GEO 209, SOC 214, SOC 325, PS 334, PS 335, PS 336, ECO 211, ECO 212, PSY 111 or PSY 112 may be taken.
- SPCH 201, 216, 334, 335 or 430 may be taken.
- ECO 211 or ECO 212 may be taken.
- BIO 236, 380, 390, 404, 409, 423, 425, 441, 443, 450 or 475 may be taken. Other courses may be taken with approval of the department Chair.

**NOTE:** Laboratory courses must be taken during the same semester as lecture for biology, chemistry and physics courses unless approved by the department chair.

### Bachelor of Science: Biology Major (Marine Science Concentration)

#### FRESHMAN YEAR

	F	S
BIO 111 General Biology I	3	

BIOL 111 General Biology I Lab	1	
BIO 112 General Biology II		3
BIOL 112 General Biology II Lab		1
BIO 114 Intro to Marine/Env. Science		2
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
CHEM 142 General Chemistry II		3
CHML 142 General Chemistry II Lab		1
MATH 111 College Algebra	3	
MATH 112 Trigonometry		3
ENG 104 Composition and Literature I	3	
ENG 105 Composition and Literature II		3
UNIV 100 a University Success (Freshman Year Total: 32 Hours)	<u>2</u>	<u>16</u>

#### SOPHOMORE YEAR

	F	S
BIO 115 General Zoology		3
BIOL 115 General Zoology Lab		1
BIO 119 General Botany	3	
BIOL 119 General Botany Lab	1	
CHEM 241 Organic Chemistry I	3	
CHML 241 Organic Chemistry I Lab	1	
CHEM 242 Organic Chemistry II		3
CHML 242 Organic Chemistry II Lab		1
MATH 241 Calculus I		3
ENG 205 World Literature	3	
PE xxxb Physical Education Option	1	
PE xxxb Physical Education Option		1
CSC 115 Digital Computer Principles (Sophomore Year Total: 27 Hours)	<u>3</u>	<u>12</u>

#### JUNIOR YEAR

	F	S
BIO 313 Introduction to Microbiology	3	
BIOL 313 Introduction to Microbiology Lab	1	
BIO 318 W Introduction to Genetics		3
BIOL 318 Introduction to Genetics Lab		1
BIO 304 Marine Science		2
BIO 392 S Independent Study	2	
BIO 390 W Seminar in Biology		1
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
PHY 202 Basic Physics II		3
PHYL 202 Basic Physics II Lab		1
MFL xxxc Modern Foreign Language I	3	
MFL xxxc Modern Foreign Language II		3
HIST 101 History of Civilization I	3	
HIST 102 History of Civilization II (Junior Year Total: 33 Hours)	<u>3</u>	<u>16</u>

#### SENIOR YEAR

	F	S
BIO 436 Marine Botany	3	
BIOL 436 Marine Botany Lab	1	
ART xxxd Fine Arts Option		3
PHIL xxxe Philosophy Option	3	

SS xxxf Social Science Option	3
SPCH xxxg Speech Option	3
BIO xxxh Marine Science Electives	4 4
ELEC xxxi General Electives	<u>4 4</u>
(Senior Year Total: 32 Hours)	15 16

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**TOTAL HOURS** **124**

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- Students earning a sub score less than 17 in English on the ACT (or the corresponding score on the SAT) will be placed in ENG 002.
- Students earning a sub score less than 17 in Mathematics on the ACT (or the corresponding score on the SAT) will be placed in MATH 004.
- Students earning a sub score less than 17 in Reading on the ACT (or the corresponding score on the SAT) will be placed in RE 002.
- All students must take the Undergraduate English Proficiency Exam (UEPE) after the sophomore year. Students not passing the exam must take ENG 399, Functional Writing.

**CORE OPTIONS**

- Students who transfer 12 or more hours of college credit are exempt from UNIV 100.
- HE 101 (3 credit hours) may be taken in place of PE xxx (1 credit hour) and PE xxx (1 credit hour).
- Students who have completed two years of a single foreign language in high school with grades of "C" or better are exempt from the foreign language requirements. This exemption must be listed on your JSU transcript. The six credit hours must be replaced with other courses.
- ART 206, MUS 205, DR 201, ENG 201 or ENG 202 may be taken.
- PHIL 301, 308, 309 or 416 may be taken.
- SS 201, SS 202, GEO 105, GEO 209, SOC 214, SOC 325, PS 334, PS 335, PS 336, ECO 211, ECO 212, PSY 111 or PSY 112 may be taken.
- SPCH 201, 216, 334, 335 or 430 may be taken.
- BIO 202, 236, 412, 414, 425, 431, 433, 434, 438, 450, 480 or 481 may be taken. Other courses may be taken with approval of the department Chair.
- Students may not take Biology, Math, Chemistry or Physics for a general elective.

**NOTE:** Laboratory courses must be taken during the same semester as lecture for biology, chemistry and physics

courses unless approved by the department chair.

**Bachelor of Science: Biology Major**  
**(Environmental Science Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
BIO 111 General Biology I	3	
BIOL 111 General Biology I Lab	1	
BIO 112 General Biology II		3
BIOL 112 General Biology II Lab		1
BIO 114 Intro to Marine/Env. Science		2
CHEM 141 General Chemistry I	3	
CHML 141 General Chemistry I Lab	1	
CHEM 142 General Chemistry II		3
CHML 142 General Chemistry II Lab		1
MATH 111 College Algebra	3	
MATH 112 Trigonometry		3
ENG 104 Composition and Literature I	3	
ENG 105 Composition and Literature II		3
UNIV 100 a University Success	<u>2</u>	
(Freshman Year Total: 32 Hours)	16	16

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 115 General Zoology		3
BIOL 115 General Zoology Lab		1
BIO 119 General Botany	3	
BIOL 119 General Botany Lab	1	
BIO 201 Environmental Science		3
BIOL 201 Environmental Science Lab		1
CHEM 241 Organic Chemistry I	3	
CHML 241 Organic Chemistry I Lab	1	
CHEM 242 Organic Chemistry II		3
CHML 242 Organic Chemistry II Lab		1
PE xxxb Physical Education Option	1	
PE xxxb Physical Education Option		1
HIST 101 History of Civilization I	3	
HIST 102 History of Civilization II		3
ENG 205 World Literature	<u>3</u>	
(Sophomore Year Total: 31 Hours)	15	16

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 313 Introduction to Microbiology	3	
BIOL 313 Introduction to Microbiology Lab	1	
BIO 318 W Introduction to Genetics		3
BIOL 318 Introduction to Genetics Lab		1
BIO 390 W Seminar in Biology		1
BIO 391 W Introduction to Research	2	
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
PHY 202 Basic Physics II		3
PHYL 202 Basic Physics II Lab		1
MFL xxxc Modern Foreign Language I	3	
MFL xxxc Modern Foreign Language II		3
ART xxxd Fine Arts Option	3	
SPCH xxxe Speech Option		<u>3</u>
(Junior Year Total: 31 Hours)	16	15

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
BIO 392 S Independent Study	2	
BIO 412 Natl Resources & Conservation		3
BIOL 412 Natl Resources & Conser. Lab		1
CSC 115 Digital Computer Principles	3	
MATH 241 Calculus I		3
PSY 201 General Psychology	3	
PHIL xxxf Philosophy Option		3
SS xxxg Social Science Option	3	
BIO xxxh Environmental Science Electives	4	5
(Senior Year Total: 30 Hours)	15	15
<b>TOTAL HOURS</b>	<b>124</b>	

- Students earning a sub score less than 17 in English on the ACT (or the corresponding score on the SAT) will be placed in ENG 002.
- Students earning a sub score less than 17 in Mathematics on the ACT (or the corresponding score on the SAT) will be placed in MATH 004.
- Students earning a sub score less than 17 in Reading on the ACT (or the corresponding score on the SAT) will be placed in RE 002.
- All students must take the Undergraduate English Proficiency Exam (UEPE) after the sophomore year. Students not passing the exam must take ENG 399, Functional Writing.

### CORE OPTIONS

- Students who transfer 12 or more hours of college credit are exempt from UNIV 100.
- HE 101 (3 credit hours) may be taken in place of PE xxx (1 credit hour) and PE xxx (1 credit hour).
- Students who have completed two years of a single foreign language in high school with grades of "C" or better are exempt from the foreign language requirements. This exemption must be listed on your JSU transcript. The six credit hours must be replaced with other courses.
- ART 206, MUS 205, DR 201, ENG 201 or ENG 202 may be taken.
- SPCH 201, 216, 334, 335 or 430 may be taken.
- PHIL 301, 308, 309 or 416 may be taken.
- SS 201, SS 202, GEO 105, GEO 209, SOC 214, SOC 325, PS 334, PS 335, PS 336, ECO 211, ECO 212, PSY 111 or PSY 112 may be taken.
- BIO 202, 236, 404, 414, 423, 425, 431, 433, 450, 480, 481, or 550 may be taken. Other courses may

be taken with approval of the department Chair.

**NOTE:** Laboratory courses must be taken during the same semester as lecture for biology, chemistry and physics courses unless approved by the department chair.

### PRE-PROFESSIONAL HEALTH CAREERS PROGRAM

In an affirmative action to eliminate some of the inequities experienced by ethnic minorities seeking employment in the health delivery system, Jackson State University has established a Pre-professional Health Careers (PHC) Program. The PHC Program is a University-wide "umbrella plan," with the following primary objectives:

- To identify and recruit individuals with the potential to pursue professional health careers.
- To provide students with information and counseling pertinent to prerequisite academic training for professional health careers.
- To place trainees in professional health programs and graduate schools.

Students presently enrolled at Jackson State University and pursuing degrees in the Natural Sciences, Social Sciences, Humanities, Education, Business, Mathematics, or Technology may simultaneously satisfy the prerequisite requirements for any of several professional health careers. Excellent employment opportunities at attractive salaries are available in virtually all of the health specialties throughout the United States. An abbreviated list of health professions is given below:

Medicine	Medical Technology
Dentistry	Public Health Education
Nursing	Physical Therapy
Pharmacy	Manual Arts Therapy
Veterinary Medicine	Speech Pathology
Optometry	Clinical Psychology
Medical Writing	Medical Illustration
Biostatistics	Medical Records Administration

The Pre-professional Health Careers Program has several special programs funded by federal and private agencies. They are: Minority High School Student Research Apprenticeship Program (NIH); Health Careers Opportunity Training Program Consortium-JSU-UMC (DHHS); Podiatric Medicine Program; Allied Health Pre-Entry Program (AHPP); and Research and Engineering Apprenticeship Program (REAP). For further information, contact: Office of Pre-professional Health Careers; College of Science, Engineering, and Technology; Jackson State University; Jackson, Mississippi 39217.

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**DEPARTMENT OF CHEMISTRY**

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Dr. Hongtao Yu, Professor and Chair

OFFICE: John A. Peoples Science Building, Room 414

**FACULTY:**

Professors A. Hamme, A. Hossain, M. Huang, K. Lee, J. Leszczynski, Y. Liu, E. Noe, J. Perkins, P. Ray, J. Watts, H. Yu, J. Zubkowski; Associate Professors Z. Arslan, N. Campbell, G. Hill, R. Venkatraman; Assistant Professor F. Han; Professors Emeritus R. Sullivan, H. Tachikawa

**MISSION**

To provide quality education to its diverse undergraduate and graduate students in fundamental, applied, and interdisciplinary areas of the chemical sciences. To carry out corresponding research activities leading to scientific discovery by its faculty, research personnel, and students. To use chemistry knowledge and technology to serve its surrounding and international communities.

**OBJECTIVES**

- To provide students with high quality educational programs with knowledge necessary for success in graduate school, professional school, and industrial or government entities. Maintain excellent research programs.
- To provide services to the community and the state.
- To promote the professional growth and development of the faculty.

The Department of Chemistry offers the Bachelor of Science degree with American Chemical Society Certification with concentrations in Biomedical Science, Environmental Science, and Forensic Science. Pre-professional programs in pre-medicine, pre-dentistry, pre-pharmacy, and pre-chemical engineering may be completed within the Bachelor of Science degree.

**PROGRAM OUTCOMES**

JSU Chemistry graduates will have:

- Outcome A: the ability to apply basic chemistry knowledge in all five modern chemistry areas to identify, formulate, and solve chemistry problems.
- Outcome B: the ability to design and conduct chemistry experiments, as well as to analyze and interpret data and results in qualitative and quantitative terms.
- Outcome C: the broad education necessary to understand the contemporary issues

and impact of the chemical sciences in global, economic, environmental, and societal contexts.

Outcome D: the ability to research chemistry topics, write research reports, and give oral and poster presentations on that topic.

Outcome E: the foundation of chemistry knowledge to perform satisfactorily on national standardized tests including pre-professional tests.

Outcome F: the ability to communicate effectively through written work and oral presentations.

Outcome G: the ability to function on multi-disciplinary teams.

Outcome H: recognition of the need for, and an ability to engage in life-long learning.

Outcome I: the ability to apply basic knowledge of mathematics, biology and physics in situations encountered by a chemist.

Outcome J: the ability to appreciate new discoveries in chemical aspects of medicinal, health, environmental, and life sciences.

Outcome K: an understanding of professional and ethical responsibility.

**REQUIREMENTS FOR THE MAJOR:**

Bachelor of Science in Chemistry  
(Certified by the American Chemical Society-122 hours)\*

**FRESHMAN YEAR**

	<b>F</b>	<b>S</b>
CHEM 141, 142 General Chemistry I and II	3	3
CHML 141, 142 General Chemistry I and II Lab	1	1
ENG 104, 105 Composition	3	3
BIO 111 General Biology	3	
BIOL 111 General Biology Lab	1	
CSC 115 Digital Computer Principles		3
UNIV 100 University Success	2	
MATH 231 Calculus I		3
HIST 101, 102 History of Civilization	<u>3</u>	<u>3</u>
(Freshman Year Total: 32 Hours)	16	16

**SOPHOMORE YEAR**

	<b>F</b>	<b>S</b>
CHEM 241, 242 Organic Chemistry	3	3
CHML 241, 242 Organic Chemistry Lab	1	1
MATH 232 Calculus II	3	
CHEM 243 Qualitative Org. Analysis		2
CHML 243 Qualitative Org. Analysis Lab		1
PHY 211, 212 General Physics I and II	4	4

PHYL 211, 212 General Physics I and II Lab	1	1
ENG 205 World Literature		3
PE xxx Physical Education Options	1	1
(Sophomore Year Total: 29 Hours)	13	16

### JUNIOR YEAR

	F	S
CHEM 320 Analytical Chemistry	3	
CHML 320 Analytical Chemistry Lab	1	
CHEM 310 Introduction Scientific Research		2
CHEM 340 Inorganic Chemistry I		3
CHML 340 Inorganic Chemistry I Lab		1
CHEM 341, 342 Physical Chemistry I and II	3	3
CHML 341, 342 Physical Chemistry I and II Lab	1	1
CHEM 381, 382 Chemistry Seminar	.5	.5
MFL 101, 102 Modern Foreign Language	3	3
MATH 233 Calculus III		3
SPCH xxx Speech Option		3
(Junior Year Total: 31 Hours)	14.5	16.5

### SENIOR YEAR

	F	S
CHEM 380 Independent Study	1	1
CHEM 421 Instrumentation		3
CHML 421 Instrumentation Lab		1
CHEM 431 Biochemistry	3	
CHML 431 Biochemistry Lab	1	
CHEM 481, 482 Chemistry Seminar	.5	.5
CHEM xxx Advanced Chemistry Course	3	3
PHIL xxx Philosophy Option	3	
ART xxx Humanities/Fine Arts Option		3
SS xxx Social/Behavioral Science Option	3	
Elective Elective Option		3
(Senior Year Total: 29 Hours)	14.5	14.5

**TOTAL HOURS** 124

\*Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

**ADVANCED CHEMISTRY COURSES:** Two (2) of the following courses: CHEM 731 (Advanced Biochemistry), CHEM 736 (Physical Organic), CHEM 738 (Organic Synthesis), CHEM 741 (Advanced Inorganic Chemistry), CHEM 758 (Quantum Chemistry), ENV 701 (Environmental Chemistry).

**CORE II OPTIONS:** (All students must complete)

- Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
- Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
- Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
- Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.

## Bachelor of Science in Chemistry

**Pre-Medical, Pre-Dental, Pre-Pharmacy (122 Hours)**

### FRESHMAN YEAR

	F	S
CHEM 141, 142 General Chemistry	3	3
CHML 141, 142 General Chemistry Lab	1	1
ENG 104, 105 Composition & Literature	3	3
BIO 111, 112 General Biology	3	3
BIOL 111, 112 General Biology Lab	1	1
HIST 101, 102 History of Civilization	3	3
UNIV 100 University Success	2	
CSC 115 Digital Computer Principles		3
(Freshman Year Total: 33 Hours)	16	17

### SOPHOMORE YEAR

	F	S
CHEM 241, 242 Organic Chemistry	3	3
CHML 241, 242 Organic Chemistry Lab	1	1
MATH 231, 232 Calculus I and II	3	3
BIO 234, 235 Hum. Anatomy & Physiology I & II	3	3
BIOL 234, 235 Hum Anat & Physiology I & II Lab	1	1
SPCH xxx Speech Option	3	
MATH 271 Elementary Statistics		3
PE xxx Physical Education Option		1
(Sophomore Year Total: 29 Hours)	14	15

### JUNIOR YEAR

	F	S
CHEM 320 Analytical Chemistry	3	
CHML 320 Analytical Chemistry Lab	1	
CHEM 340 Inorganic Chemistry I		3
CHML 340 Inorganic Chemistry I Lab		1
CHEM 341 Physical Chemistry I	3	
CHML 341 Physical Chemistry I Lab (W)	1	
CHEM 381, 382 Chemistry Seminar	.5	.5
PHY 201, 202 Basic Physics	3	3
PHYL 201, 202 Basic Physics Lab	1	1
MFL 101, 102 German or French	3	3
CHEM 380 Independent Study	1	
ENG 205 World Literature		3
PE xxx Physical Education Option		1
(Junior Year Total: 32 Hours)	16.5	15.5

### SENIOR YEAR

	F	S
CHEM 431, 432 Biochemistry I & II	3	3
CHML 431 Biochemistry I Lab	1	
BIO 313 Microbiology	3	
BIOL 313 Microbiology Lab	1	
CHEM 380 Independent Study	1	
CHEM 481, 482 Chemistry Seminar (S)	.5	.5
CHEM xxx Chemistry Option	3	3
SS xxx Social/Behavioral Science Option	3	
ART xxx Humanities/Fine Arts Option		3
PHIL xxx Philosophy Option		3
(Senior Year Total: 28 Hours)	14.5	13.5

**TOTAL HOURS:** 122

\*Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

**CHEMISTRY OPTIONS:** At least two (2) of the following courses: CHEM 342 (Physical Chemistry II), CHEM 421 (Instrumentation), CHEM 441 (Inorganic Chemistry II), BIO 218, 318, 440, 441, and 470 (Immunology).

**CORE II OPTIONS:** (All students must complete)

- A. Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
- B. Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
- C. Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
- D. Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.

**Bachelor of Science in Chemistry**

**Biomedical Science Concentration (121 Hours)**

**FRESHMAN YEAR**

	<b>F</b>	<b>S</b>
CHEM 141, 142 General Chemistry	3	3
CHML 141, 142 General Chemistry Lab	1	1
ENG 104, 105 Composition	3	3
BIO 111, 112 General Biology	3	3
BIOL 111, 112 General Biology Lab	1	1
HIST 101, 102 History of	3	3
UNIV 100 University Success	2	
CSC 115 Digital Computer Principles	<u>3</u>	
(Freshman Year Total: 33 Hrs.)	16	17

**SOPHOMORE YEAR**

	<b>F</b>	<b>S</b>
CHEM 241, 242 Organic Chemistry	3	3
CHML 241, 242 Organic Chemistry Lab	1	1
CHEM 243 Qual. Organic Analysis	2	
CHML 243 Qual. Organic Analysis Lab	1	
MATH 231, 232 Calculus I and II	3	3
SPCH xxx Speech Option	3	
ENG 205 World Literature	3	
MFL 101, 102 Modern Foreign Language	3	3
PE xxx Physical Education	<u>1</u>	
(Sophomore Year Total: 30 Hours)	16	14

**JUNIOR YEAR**

	<b>F</b>	<b>S</b>
CHEM 320 Analytical Chemistry	3	
CHML 320 Analytical Chemistry Lab	1	
CHEM 341 Physical Chemistry	3	
CHML 341 Physical Chemistry Lab (W)	1	
PHY 201, 202 Basic Physics I and II	3	3
PHYL 201, 202 Basic Physics I and II Lab	1	1
CHEM 381, 382 Chemistry Seminar	.5	.5
CHEM 340 Inorganic Chemistry I	3	
CHML 340 Inorganic Chemistry I Lab	1	
CHEM 310 Introduction to Research	2	

CHEM 380 Independent Study	1	
PE xxx Physical Education	1	
BIO Biomed Option + Lab	<u>4</u>	
(Junior Year Total: 29 Hours)	13.5	15.5

**SENIOR YEAR**

	<b>F</b>	<b>S</b>
CHEM 421 Instrumentation		3
CHML 421 Instrumentation Lab		1
PHIL xxx Philosophy Option	3	
CHEM 431, 432 Biochemistry I and II	3	3
CHML 431 Biochemistry I Lab	1	
CHEM 380 Independent Study	1	
CHEM 481, 482 Chemistry Seminar	.5	.5
PHIL xxx Philosophy Option		3
BIO xxx Biomed Option	3	
SS xxx Social/Behavioral Sciences	3	
ART xxx Humanities/Fine Arts Option		3
ELEC xxx Elective	<u>3</u>	
(Senior Year Total: 29 Hours)	17.5	13.5

**TOTAL HOURS**

**121**

\* Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

**BIOMEDICAL SCIENCE OPTION:** Two (2) of the following, one of which must have lab: 234 (Human Anatomy and Physiology), BIO 313 (Introduction to Microbiology), BIO 318 (Introduction to Genetics), BIO 440 (Cell Biology), BIO 409 (General Genetics).

**CORE II OPTIONS:** (All students must complete)

- A. Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
- B. Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
- C. Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
- D. Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.



**Bachelor of Science in Chemistry**  
**Forensic Science Concentration (122 Hours)**

<b>FRESHMAN YEAR</b>		<b>F</b>	<b>S</b>
CHEM 141, 142 General Chemistry		3	3
CHEM 141, 142 General Chemistry Lab		1	1
BIO 111, 112 General Biology		3	3
BIOL 111, 112 General Biology Lab		1	1
HIST 101, 102 History Civilization		3	3
ENG 104, 105 Composition & Literature		3	3
UNIV 100 University Success		2	
CSC 115 Digital Computer Principles			<u>3</u>
(Freshman Year Total: 33 Hours)		16	17

<b>SOPHOMORE YEAR</b>		<b>F</b>	<b>S</b>
CHEM 241, 242 Organic Chemistry		3	3
CHML 241, 242 Organic Chemistry Lab		1	1
MATH 231, 232 Calculus I and II		3	3
MATH 271 Elementary Statistics			3
SPCH xxx Speech Option		3	
ENG 205 World Literature			3
PE xxx Physical Education Option		1	1
ART xxx Humanities/Fine Arts Option		<u>3</u>	
(Sophomore Year Total: 28 Hours)		15	15

<b>JUNIOR YEAR</b>		<b>F</b>	<b>S</b>
CHEM 320 Analytical Chemistry		3	
CHML 320 Analytical Chemistry Lab		1	
CHEM 340 Inorganic Chemistry I			3
CHML 340 Inorganic Chemistry I Lab			1
PHY 201, 202 Basic Physics I and II		3	3
PHYL 201, 202 Basic Physics I and II Lab		1	1
MFL 101, 102 Modern Foreign Language		3	3
CHEM 381, 382 Chemistry Seminar		.5	.5
CHEM 371 Forensic Chemistry			3
CHML 371 Forensic Chemistry Lab			1
BIO xxx Microbiology		<u>3</u>	
(Junior Year Total: 30 Hours)		14.5	14.5

<b>SENIOR YEAR</b>		<b>F</b>	<b>S</b>
CHEM 341 Physical Chemistry		3	
CHML 341 Physical Chemistry Lab (W)		1	
CHEM 421 Instrumentation			3
CHML 421 Instrumentation Lab			1
CHEM 431 Biochemistry I		3	
CHML 431 Biochemistry I Lab		1	
CHEM 471 Forensic Toxicology			3
CHEM 475 Forensic Practicum			3
CHEM 481, 482 Chemistry Seminar		.5	.5
PHIL xxx Philosophy Option			3
CJ 324 Intro. Criminal Justice		3	
CJ 443 Found. Criminal Investigation			3
SS xxx Social/Behavioral Sciences		<u>3</u>	
(Senior Year Total: 31 Hours)		14.5	16.5

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**TOTAL HOURS** **122**

\* Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

- CORE II OPTIONS:** (All students must complete)
- A. Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
  - B. Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
  - C. Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
  - D. Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.

**Bachelor of Science in Chemistry**  
**Environmental Sciences Concentration (122 Hours)**

<b>FRESHMAN YEAR</b>		<b>F</b>	<b>S</b>
CHEM 141, 142 General Chemistry		3	3
CHML 141, 142 General Chemistry Lab		1	1
ENG 104, 105 Composition		3	3
BIO 111, 112 General Biology		3	3
BIOL 111, 112 General Biology Lab		1	1
HIST 101, 102 History of Civilization		3	3
UNIV 100 University Success		2	
CSC 115 Digital Computer Principles			<u>3</u>
(Freshman Year Total: 33 Hours)		16	17

<b>SOPHOMORE YEAR</b>		<b>F</b>	<b>S</b>
CHEM 241, 242 Organic Chemistry		3	3
CHML 241, 242 Organic Chemistry Lab		1	1
MATH 231, 232 Calculus I and II		3	3
PHIL xxx Philosophy Option			3
SPCH xxx Speech Option		3	
ENG 205 World Literature			3
PE xxx Physical Education		1	1
SS xxx Social/Behavioral Science Option		<u>3</u>	
(Sophomore Year Total: 28 Hours)		15	15

<b>JUNIOR YEAR</b>		<b>F</b>	<b>S</b>
CHEM 310 Introduction to Research			2
CHEM 320 Analytical Chemistry		3	
CHML 320 Analytical Chemistry Lab		1	
CHEM 340 Inorganic Chemistry I			3
CHML 340 Inorganic Chemistry I Lab			1
CHEM 341 Physical Chemistry		3	
CHML 341 Physical Chemistry Lab		1	
CHEM 380 Independent Study			1
CHEM 381, 382 Chemistry Seminar		.5	.5
PHY 201, 202 Basic Physics I and II		3	3
PHYL 201, 202 Basic Physics I and II Lab		1	1
MFL 101, 102 Modern Foreign Language		<u>3</u>	<u>3</u>
(Junior Year Total: 30 Hours)		15.5	14.5

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CHEM 421 Instrumentation		3
CHML 421 Instrumentation Lab		1
CHEM 431 Biochemistry	3	
CHML 431 Biochemistry Lab	1	
CHEM 481, 482 Chemistry Seminar	.5	.5
CHEM 410 Environmental Chemistry	3	
CHML 410 Environmental Chem. Lab	1	
CHEM 380 Independent Study	1	
BIO ENV Option + Lab		4
BIO ENV Option + Lab		4
CHEM xxx Toxicology Option		3
ELEC xxx Elective		3
ART xxx Humanities/Fine Arts Option		3
(Senior Year Total: 31 Hours)	15.5	15.5

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**TOTAL HOURS** **122**

\*Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

**ENVIRONMENTAL SCIENCE OPTIONS:** Two (2) of the following: BIO 201 & BIOL 201 (Introduction to Environmental Sciences and Lab), BIO 403 & BIOL 403 (Human Environments and Natural Systems and Lab), BIO 404 & BIOL 404 (Introduction to Environmental Science); Toxicology Option: CHEM 471 (Forensic Toxicology), ITHM 400 (Principles of Toxicology), ITHM 529 (Environmental Toxicology and Risk Assessment).

**CORE II OPTIONS:** (All students must complete)

- A. Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
- B. Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
- C. Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
- D. Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.

**Bachelor of Science in Chemistry (122 Hours)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
CHEM 141, 142 General Chemistry	3	3
CHML 141, 142 General Chemistry Lab	1	1
ENG 104, 105 Composition	3	3
MATH xxx Mathematics Options	3	3
BIO 111 General Biology	3	
BIOL 111 General Biology Lab	1	
UNIV 100 University Success	2	
CSC 115 Digital Computer Principles		3
ART xxx Humanities/Fine Arts Option		3
(Freshman Year Total: 32 Hours)	16	16

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
CHEM 241, 242 Organic Chemistry	3	3
CHML 241, 242 Organic Chemistry Lab	1	1
MATH 231, 232 Calculus I and II	3	3
HIST 101, 102 History of Civilization	3	3
ENG 205 World Literature	3	
CHEM 243 Qual. Organic Analysis		2
CHML 243 Qual. Organic Analysis Lab		1
PE xxx Physical Education Option	1	1
(Sophomore Year Total: 28 Hours)	15	15

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
CHEM 320 Analytical Chemistry	3	
CHML 320 Analytical Chemistry Lab	1	
CHEM 340 Inorganic Chemistry I		3
CHML 340 Inorganic Chemistry I Lab		1
CHEM 381, 382 Chemistry Seminar	.5	.5
PHY 201, 202 Basic Physics I and II	3	3
PHYL 201, 202 Basic Physics I and II Lab	1	1
MFL 101, 102 Modern Foreign Language	3	3
SPCH xxx Speech Option		3
PHIL xxx Philosophy Option		3
(Junior Year Total: 29 Hours)	14.5	14.5

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
CHEM 341 Physical Chemistry		3
CHML 341 Physical Chemistry Lab (W)		1
CHEM 421 Instrumentation		3
CHML 421 Instrumentation Lab		1
CHEM 481, 482 Chemistry Seminar	.5	.5
CHEM xxx Chemistry Option	3	3
ELEC xxx Elective Options	6	9
SS xxx Social/Behavioral Science Option		3
(Senior Year Total: 33 Hours)	16.5	16.5

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**TOTAL HOURS** **122**

\*Other Requirements: Standardized Test (GRE, MCAT, MFT, etc.), Research Report, and Research Presentation

**CHEMISTRY OPTIONS:** At least one (1) of the following courses: CHEM 342 (Physical Chemistry), CHEM 431 (Biochemistry), CHEM 441 (Inorganic Chemistry II)

**MATH OPTIONS:** Two (2) of the following : MATH 111, MATH 112, or MATH 118, MATH 242, MATH 243. If taking MATH 118, there will be one less credit hour needed for the student to graduate. If a student is qualified to take MATH 241 in the freshman year, MATH 111, 112, or 118 are not required, rather, the student can take MATH 242, MATH 243, or other elective courses as options.

**CORE II OPTIONS:** (All students must complete)

- A. Social/Behavioral Science: SS 201, 202, SOC 214, 325, 335, PS 334, 335, 336, GEOG 105, 209, ECO 211, or 212.
- B. Fine Arts/Humanities: ART 206, DR 201, MUS 205, ENG 201H, or 202H.
- C. Speech Options: SPCH 201, 216, 300, 334, 335, or 430.
- D. Philosophy Options: PHIL 201, 308, 309, or 416, MNGT 482, SW 210.

**DEPARTMENT OF MATHEMATICS**

Dr. Tor A. Kwembe, Professor and Chair

OFFICE: Just Hall of Science Building, Room 225

**FACULTY:**

Professors R. Gentry, R. Gompa, M. Khadivi, T. Kwembe  
Associate Professors L. Buckley, D. Chen, B. Diatta,  
C. Wafo Soh, Z. Zhang; Assistant Professors D. Bramlett,  
E. Holbrook, J. Talley, C. Wright, X. Yang; Instructors M.  
Canon, A. Jefferson

**OBJECTIVES**

The objectives of the Department of Mathematics are as follows:

- To develop the quantitative skills of students who enjoy the enterprise of problem solving and the reward of discovery.
- To encourage students to pursue advanced training in mathematics commensurate with their goals and talents.
- To illustrate the role of mathematics in research and related areas of scientific endeavor.
- To prepare effective teachers of mathematics and competent mathematicians for work in business, government, and industry. Offering a course of study in mathematics for students entering the University with mathematics deficiencies.
- To offer courses essential for those students pursuing study in major fields other than mathematics, including those that elect to minor in mathematics.

The Department of Mathematics offers the Bachelor of Science Degree in Mathematics (BS), and the Bachelor of Science in Education Degree in Mathematics Education (BSE), with concentrations in various areas of Pure and Applied Mathematics.

Students interested in obtaining either the BS degree

or the BSE degree must meet all admission requirements into Jackson State University. Students who have interest in mathematics must declare a major in mathematics for the BS degree or mathematics education for the BSE degree. There are no special requirements set by the Department of Mathematics for admission into any of its undergraduate programs. A student who is interested in majoring in mathematics should have an adequate mathematics preparation in high school to begin at the calculus sequence. Mathematics majors who begin under the calculus sequence may use those courses toward general electives for graduation.

To receive the BS or BSE degree, a student must maintain an overall GPA of at least 2.0 and at least 2.5 in all core mathematics and English courses. The total number of hours of course work for the BS or BSE is at least 124 semester hours including transfer credits. In addition, to receive the BSE degree a student must be admitted to the Teacher Education Program which is sought through the College of Education and Human Development. Students interested in entering teacher education should see Requirements for Admission to Teacher Education in this issue of the Jackson State University Undergraduate Catalog under the College of Education and Human Development.

**Bachelor of Science: Mathematics Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
MATH 231, 232 Calculus I and II	4	4
HE 101 or Concepts of Health	3	
PE xxx or 100-Level Courses	1	1
ENG 104, 105 Composition	3	3
+SCI xxx Science Option		3/4
HIST 101, 102 History of Civilization	3	3
++UNIV 100 University Success	2	
+++FLG101, 102 Foreign Language Option	3	3
(Freshman Year Total: 33-35 Hours)	16-18	16-18

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
MATH 233 Calculus III	4	
MATH 234 Proofs and Mathematical Writing	3	
MATH 303W Set Theory and Logic		3
ENG 205 or World Literature I or ENG 206 Literature of Science	3	
ART 206 or Art Appreciation or MUS 205 Music Appreciation		3
++++SS xxx Social Science Option	3	
+SCI xxx Science Option w Labs	4	5
CSC 118 Programming Fundamentals		3
CSCL 118 Programming Fundamentals Lab		1
(Sophomore Year Total: 32 Hours)	17	15

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 355 Probability and Statistics		3
MATH 331 Linear Algebra Matrix Theory I	3	
MATH 368 Ordinary Different Equation I	3	
MATH 321W Modern Geometry		3
SPCH 201 Speech Arts	3	
ELEC xxx General Elective		3
++++MATHxxx Mathematics Elective		3
+SCI xxx Science Option		<u>3/4</u>
(Junior Year Total: 24-25 Hours)	12-13	12

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 311W Abstract Algebra I	3	
MATH 351 Advanced Calculus I	3	
MATH 403S Mathematics Seminar		3
MATH 451 General Topology		3
PHIL 301 or Introduction to Philosophy or PHIL 416 Logic		3
ELEC xxx General Elective	3	3
++++MATHxxx Mathematics Elective		3
+SCI xxx Science Option		<u>4/5</u>
(Senior Year Total: 31-32 Hours)	16-17	15

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**TOTAL HOURS** **120-124**

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**Bachelor of Science in Education:  
Mathematics Education Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
MATH 231, 232 Calculus I and II	4	4
HE 102 Concepts of Health for Teachers		3
ENG 104, 105 Composition	3	3
BIO 101 Introduction to Biology	2	
BIOL 101 Introduction to Biology Lab	1	
HIST 101, 102 History of Civilization	3	3
++UNIV 100 University Success	2	
ART 206 or Art Appreciation or MUS 205 Music Appreciation		3
+++FLG101, 102 Foreign Language Option	<u>3</u>	<u>3</u>
(Freshman Year Total: 37 Hours)	18	19

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
MATH 233 Calculus III	4	
MATH 303W Set Theory and Logic		3
PSY 201 General Psychology		3
ENG 205 World Literature	3	
ENG 206 Literature of Science		3
EDCI 100 Introduction to Education	3	
SS 203 Historical Cultural Foundtn Educ.		3
SPCH 201 Speech Arts/Option	3	
CSC 117 Fortran Programming		<u>3</u>
(Sophomore Year Total: 28 Hours)	13	15

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 368 Differential Equations		3
MATH 331 Linear Algebra Matrix Theory I		3
MATH 311W Abstract Algebra		3
MATH 321W Modern Geometry I		3
MATH 355 Probability & Statistics I	3	
MATH 493W History of Mathematics		3
ETEC 367 Intro. Assessment Measures & Eval		3
COUN 315 Human Development Learning	3	
PHY 201, 202 Basic Physics I and II or PHYL 201, 202 Basic Physics I and II Lab or PHY 211, 212 General Physics I and II		3/4
PHYL 211, 212 General Physics I and II Lab		<u>1</u>
(Junior Year Total: 28-29 Hours)	16-17	12

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 402W Methods of Teaching Math in Secondary School		3
MATH 403S Mathematics Seminar		3
RE 455 Diagnostic Reading Instruction in Secondary School		3
EDCI 401 Research Theory Clinical Practice	3	
SS 301 Law & Social Systems		3
EDCI 402 Clinical Internship in Student Tchng		12
PHIL 301 or Introduction to Philosophy or PHIL 416 Logic		<u>3</u>
(Senior Year Total: 30 Hours)	18	12

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**TOTAL HOURS** **123-124**

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**NOTE:**

+See list of Science Options.

++Students who transfer 12 or more hours of college credits are exempt from this course, but must meet the minimum degree requirements.

+++Students who have completed two years of a foreign language in high school with a "C" or above are exempt from the foreign language requirement but must take six additional semester hours of course work. See list of Foreign Language Options.

++++Mathematics electives must be from list of Concentration-Specialization and courses must be from the 300-400 level.

+++++See list of Social Science Options.

\*Concentration-Specialization:

Pure Mathematics	Algebra	Number Theory
Complex Variables	Geometry	Analysis
Set Theory and Logic	Applied Mathematics	
Differential Equations	Financial Mathematics	
Mathematical Modeling	Numerical Analysis	
Operations Research	Probability and Statistics	

\*Students should consult an advisor for courses in these areas.

**SCIENCE OPTIONS:**

BIO 101 Biological Science and Lab  
BIO 111 Introduction to Biology and Lab  
SCI 201 or 202 Physical Science and Lab  
SCI 205 Earth and Space Science  
CHEM 201 Chemistry and Society and Lab  
CHEM 131 Introduction to Chemistry and Lab  
CHEM 141or 142 General Chemistry I or II and Labs  
PHY 151 Introduction to Physics  
PHY 201 or 202 Basic Physics I or II and Labs  
PHY 211 or 212 General Physics I or II and Labs  
PHY 241 Introduction to Astronomy  
MET 200 Introduction to Meteorology

**SOCIAL SCIENCE OPTIONS:**

SS 201 or 202 Social Institutions  
GEOG 115 Introduction to Cultural Geography  
GEOG 209 World Regional Geography  
SOC 214 Introduction to Sociology  
SOC 325 Cultural Anthropology  
PS 344 Introduction to Political Science  
PS 335 American Government  
PS 336 State and Local Government  
ECO 211 or 212 Principles of Economics  
PSY 201/111-112 General / Introduction to Psychology

**FOREIGN LANGUAGE OPTIONS:**

FR 101 & 102 Elementary French  
GR 101 & 102 Elementary German  
SP 101 & 102 Elementary Spanish  
LAT 101 & 102 Elementary Latin  
POR 101 & 102 Elementary Portuguese  
CHI 101 & 102 Mandarin Chinese

**ELEMENTARY EDUCATION MAJORS:**

Elementary Education majors who are seeking a content knowledge area in mathematics must complete the following courses: MATH 111, 112, 226, 227, 306, 401W, and 493W.

Substitute courses must be approved by the Department of Mathematics.

**Requirements for a Minor in Mathematics:**

Students electing a minor in mathematics must complete a minimum of 21 semester hours of mathematics course work; nine (9) hours must be taken from courses beyond the Calculus sequence with the approval of the Department of Mathematics.

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**DEPARTMENT OF PHYSICS, ATMOSPHERIC SCIENCES AND GEOSCIENCE**

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Dr. Mehri Fadavi, Professor and Interim Chair

OFFICE: Just Hall of Science Building, Room 327

**FACULTY:**

Professors M. Fadavi, E. Heydari, T. Shahbazyan, Q. Williams; Associate Professors R. Karim, R. Reddy, W. Walters, L. White; Assistant Professors C. Drake, D. Lu, Serguei Goupalov; Visiting Assistant Professors P. Chang, A. Khan; Visiting Instructors K. Greene, V. Shankar, J. G. Zhou; Visiting Assistant Professor E. Ayieta

**MISSION**

The Department of Physics, Atmospheric Sciences and Geoscience is rapidly growing and has a diverse range of active research areas which include optics and photonics, meteorological observations, modeling and forecasting, computational sciences, nanotechnology, materials science, theoretical condensed matter physics, renewable energy, Earth and space science, and science education. Teaching (e.g., modern teaching tools and methods) and Service (e.g., good working collaborations with other units and organizations and playing supporting roles towards local school systems and community college systems) are also key components of the program. Students graduate with global awareness and core competencies to take on responsibilities imposed by modern society. The Department has achieved national ranking in the number of students enrolled as majors and in the number of graduates produced. Graduates of the program excel in graduate study, research, and in their professional careers.

**OBJECTIVE**

The objective of the Bachelor of Science in Physics program is to prepare students for careers in physics research, engineering, medicine, and other professional fields including physics teaching in high schools. The Bachelor of Science in Meteorology prepares students for careers in meteorology and for graduate study in meteorology or related fields. The program also teaches students from other disciplines about basic characteristics and phenomena of the atmosphere. The Bachelor of Science in Earth System Science prepares students for geoscience careers and graduate study in related fields. Graduates of the Earth System Science program

are prepared to work in a wide range of areas such as global change, natural resource exploration and environmental science. The Master of Science in Teaching in the Science Education program is designed for persons with an adequate background in science who need additional preparation to become science teachers in K-12 schools. The general philosophy of the Department is that each student should be able to reason, to collect facts and opinions, to think critically and to make informed decisions concerning his or her physical, social, economic, and political environment. The Department's philosophy is that thinking is a skill that can be taught, and that a good scientist is also a good citizen. The purpose of the Department is to guide students in the acquisition of knowledge and the development of the skills, understanding, and appreciation necessary for a professional education in physics, atmospheric sciences, and geoscience. Faculty, staff, and students are integral parts of the Department's vision and engage in research at the frontiers of science. Department faculty members are active in research, writing proposals, supervising students' research and disseminating research results through publication in journals and presenting in professional meetings.

**Goals of the Department are as follows:**

1. To prepare students for careers in physical research, medicine, engineering, meteorological research, professional meteorology, and other professional areas including the teaching of physics and physical sciences.
2. To prepare students for graduate programs in physics, atmospheric sciences, Earth Sciences, engineering, other applied sciences, graduate programs in management, materials science, and for medical and dental schools.
3. To develop an understanding of basic scientific principles, concepts, and the application of science in all students taking courses in the Department; to provide courses for students with other career interests which will increase their awareness of the environment and universe.
4. To excel in research and development in the areas of meteorological observation, forecasting and modeling, atomic and molecular physics, optics, materials science, nanotechnology, computational science, renewable energy, and Earth and space science.
5. To develop more collaborative research and development projects with other departments in Jackson State University, other institutions, state agencies, and non-profit and for profit organizations.
6. To provide services to the community, the state, the nation, and the world in matters concerning science, particularly, physics, atmospheric science and the geosciences.

**DEGREE PROGRAMS**

The Department of Physics, Atmospheric Sciences and Geoscience offers Bachelor of Science degrees in Physics, Meteorology and Earth system science. The Department also offers the Master of Science in Teaching in Science Education. The B.S. in Meteorology is the only degree program in Meteorology in Mississippi and in its neighboring states. The B.S. in Physics has two tracks: (1) B.S. Physics (General Physics Concentration) and (2) B.S. Physics (Leading to Alternate Career Choice Option). Physics courses prepare students with good mathematical and analytical skills. The B.S. in Earth System Science is the only degree program of its kind in Mississippi and the adjacent states. This degree program prepares students to attack problems that are related to the Earth and its environment and resources.

In every skilled profession, such as engineering, medicine, management, teaching, etc., analytical expertise, gained through mathematics and physics courses, will provide an added opportunity/tool to choose and succeed in that profession. A thorough study of mechanics, statistical physics, modern physics, electromagnetic theory, and quantum mechanics, along with introductory physics courses and introductory math courses, enhances students' ability and updates modern technological innovations needed to succeed in alternate career choices. The curriculum gives the option to choose about six (6) courses in areas other than physics. This will keep students on track to go to graduate schools in physics. Additionally, the curriculum opens an avenue to choose other career options. Students take a set of guided optional courses to make themselves eligible for other careers adjacent to physics.

**Bachelor of Science: Physics Major  
(General Physics Concentration)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
ENG 104, 105 Composition	3	3
HIST 101, 102 History of Civilization	3	3
MATH 241 Calculus I with Lab		3
BIO 111 General Biology	3	
BIOL 111 General Biology Lab	1	
CHEM 141, 142 General Chemistry I and II	3	3
CHML 141, 142 General Chemistry I and II Lab	1	1
CSC 117 FORTRAN Programming		3
UNIV 100 University Success	2	
PHY 198, 199 Physics Seminar	.5	.5
(Freshman Year Total: 33 Hours)	16.5	16.5

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
ENG 205 World Literature	3	
ENG 206 Literature of Science		3
MATH 232 Calculus II with Lab	3	
MATH 233 Calculus III with Lab		3
PHY 205 Intro to Nanoscience	3	
PHY 211, 212 General Physics I and II	4	4
PHYL 211, 212 General Physics I and II Lab	1	1
PHY 298, 299 Physics Seminar	.5	.5
(Sophomore Year Total: 29 Hours)	14.5	14.5

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
ELEC xxx Free Electives		3
FR, GR, CHI, or SP 101, 102		
Foreign Language Option	3	3
MUS 205 or Music Appreciation or		
ART 206 Art Appreciation	3	
PHY 311, 312 Theoretical Mechanics I and II	3	3
PHY 330W Methods Experimental Physics I		3
PHY 361, 362 Math Methods in Physics		
and Chemistry I & II	3	3
PHY 398, 399 Physics Seminar	.5	.5
MATH 244 Calculus IV with Lab		3
(Junior Year Total: 31 Hours)	15.5	15.5

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
SS xxx Social Science Option	3	
PHIL 301 Introduction to Philosophy	3	
ELEC xxx Free Electives		3
PHY xxx Physics Elective		3
HE 101 Concepts of Health		3
PHY 351 Thermal & Statistical Physics	3	
PHY 422 Quantum Mechanics	3	
PHY 431 Atomic Nuclear Physics		3
PHY 498S, 499S Physics Seminar	.5	.5
PHY 411, 412 Electromagnetic Theory	3	3
(Senior Year Total: 31 Hours)	15.5	15.5

**TOTAL HOURS** **124**

(Minimum Credit Hours required for the Degree: 122)

**NOTE:** Students must satisfactorily pass the English Proficiency Examination.

**Bachelor of Science: Physics Major  
(Pre-Medicine Concentration-leading to an alternate career choice option)**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
ENG 104, 105 Composition and Literature I and II	3	3
HIST 101, 102 History of Civilization I and II	3	3
MATH 231 Calculus I with Lab		3
BIO 111 General Biology I		3
BIOL 111 General Biology Lab	1	
CHEM 141, 142 General Chemistry I and II	3	3
CHML 141, 142 General Chemistry I and II Lab	1	1
HE 101 Concepts of Health		3
UNIV 100 University Success	2	
PHY 198, 199 Physics Seminar	.5	.5
(Freshman Year Total: 33 Hours)	16.5	16.5

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
ENG 205 World Literature	3	
ENG 206 Literature of Science	3	
SPCH 201 Speech Arts		3
PHY 211, 212 General Physics I and II	4	4
PHYL 211, 212 General Physics I and II Lab	1	1
MATH 242 Calculus II with Lab	3	
CSC 115 Digital Computer Principles		3
*OPT 1 Career Option Course I	3	
*OPT 2 Career Option Course II		3
PHY 298, 299 Physics Seminar	.5	.5
MATH 243 Calculus III with Lab		3
(Sophomore Year Total: 35 Hours)	17.5	17.5

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MUS 205 or Music Appreciation or		
ART 206 Art Appreciation		3
PHY 361 Math Methods in Physics and Chemistry I	3	
FR, GR, CHI or SP 101, 102		
Foreign Language Option	3	3
PHY 311 Theoretical Mechanics I	3	
PHY 351 Thermal and Statistical Physics	3	
PHY 330W Methods of Experimental Physics		3
PHIL 301 Introduction to Philosophy		3
*OPT 3 Career Option Course III		3
PHY 398S, 399S Physics Seminar	.5	.5
MATH 244 Calculus IV with Lab		3
(Junior Year Total: 31 Hours)	15.5	15.5

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
PHY 411 Electromagnetic Theory I	3	
PHY 422 Quantum Mechanics	3	
PHY 431 Atomic and Nuclear Physics		3

SS/SOC xxx Social Science Option	3
ELECT Free Electives	3
ELECT Physics Elective	3
*OPT 5 Career Option Course iV	3
*OPT 6 Career Option Course V	3
PHY 498S,499S Physics Seminar	.5 .5
(Senior Year Total: 25 Hours)	12.5 12.5

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**TOTAL HOURS** **124**

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(Minimum Credit Hours required for degree: 122)

**NOTE:** Students must satisfactorily pass the English Proficiency Examination.

a. Students with "MEDICINE" as career choice:

Option:	Hours:
OPT 1 BIO 112 & BIOL 112 (General Biology II and Lab)	4
OPT 2 BIO 218 & BIOL 218 (Comparative Anatomy and Lab)	4
OPT 3 CHEM 241 & CHML 241 (Organic Chemistry I and Lab)	4
OPT 4 CHEM 242 & CHML 242 (Organic Chemistry II and Lab)	4
OPT 5 CHEM 431 & CHML 431 (Biochemistry and Lab)	4

b. Student with "MBA/MANAGEMENT" as career choice:

Option:	Hours:
OPT 1 MNGT 330 (Management to Organizatns)	3
OPT 2 ECO 211 (Principles of Macroeconomics)	3
OPT 3 ECO 212 (Principles of Microeconomics)	3
OPT 4 MNGT 333 (Quantitative Bus. Analysis)	3
OPT 5 MNGT 350 (Data Base Mngmt Syst Appl)	3
OPT 6 MNGT 460 (Management Info Systems)	3

c. Students with "PHYSICS TEACHING IN HIGH SCHOOL" as career choice:

Option:	Hours:
OPT 1 EDCI 100 (Introduction to Education)	3
OPT 2 EDFL 203 (Foundations of Education)	3
OPT 3 GUID 215 (Human Development Lrng)	3
OPT 4 SCI 205 and SCIL 205 (Earth Science for Teachers and Lab)	3
OPT 5 EDFL 367 (Assessment, Measurements & Evaluation)	3
OPT 6 EDCI 401 (Research in Classroom Mngmnt)	3

d. Students with other career choices than mentioned above should consult with his/her advisor. Other possible career choice could be:

- Atmospheric Physics
- Medical Physics/Biophysics
- Computational Sciences
- Nano-Science and Technology
- Earth and Space Science
- Electrical Engineering
- Computer Engineering
- Materials Science and Engineering
- Physics Education, Physical Science Education

\* OPT course will be sequenced following prerequisites and as courses offered by the respective departments.

**Bachelor of Science: Meteorology Major**

FRESHMAN YEAR	F	S
ENG 104, 105 Composition and Literature I & II	3	3
HIST 101, 102 History of Civilization I & II	3	3
UNIV 100 University Success	2	
MATH 231 Calculus I with Lab		3
CSC 117 FORTRAN		3
HE 101 Concepts of Health	3	
MET 200 Introduction to Meteorology	3	
MET 210 Climatology		3
MET 200L Atmospheric Processes & Patterns	1	
MET 219L Weat. Analysis/Forecasting Lab I		1
(Freshman Year Total: 31 Hours)	15	16

SOPHOMORE YEAR	F	S
MATH 232 Calculus II with Lab	3	
MATH 233 Calculus III with Lab		3
PHY 211, 212 General Physics I and II	4	4
PHYL 211, 212 General Physics I and II Lab	1	1
CHEM 141, 142 General Chemistry I and II	3	3
CHML 141, 142 General Chemistry I and II Lab	1	1
MET 303 Measurements and Observations	3	
MET 303L Meas and Observations Lab	1	
MET 311 General Meteorology		3
MET 299L Weat. Analysis/Forecasting Lab II		1
(Sophomore Year Total: 32 Hours)	16	16

JUNIOR YEAR	F	S
MATH 244 Calculus with Lab	3	
MET 321 Atmospheric Thermodynamics	3	
MET 341 Dynamic Meteorology		3
MET 399L Weat. Analysis/Forecasting Lab III		1
SPCH 201 Speech Arts Option		3
FR, GR, CHI or SP 101, 102 Foreign Language Option	3	3
ENG 205 World Literature		3
PHIL 301 Intro to Philosophy	3	
ELECT Free Electives	3	3
(Junior Year Total: 31 Hours)	15	16



<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
MATH 361 Differential Equations	3	
MATH 355 Statistics		3
SS/SOC Social Science Option	3	
MET 411W Physical Meteorology	3	
MET 421 Synoptic Meteorology	2	
MET 421L Synoptic Meteorology Lab	2	
MET 472 Research Methods	1	
ELECT Free Electives		3
MUS 205 or Music Appreciation or ART 206 Art Appreciation		3
MET 431 Numerical Methods		3
MET 499S Meteorology Seminar		1
ELECT Free Electives	<u>3</u>	
(Senior Year Total: 27 Hours)	14	13

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**TOTAL HOURS** **124**

(Minimum Credit Hours required for degree: 122)

**NOTE:** Students must satisfactorily pass the English Proficiency Examination.

**Bachelor of Science: Earth System Science Major**

<b>FRESHMAN YEAR</b>	<b>F</b>	<b>S</b>
ENG 104, 105 Composition and Literature I & II	3	3
HIST 101, 102 History of Civilization I & II	3	3
UNIV 100 University Success	2	
MATH 118 College Algebra & Trigonometry	3	
MATH 231 Calculus I with Lab		3
HE 101 Concepts of Health	3	
CHEM 141, 142 General Chemistry I and II	3	3
CHML 141, 142 General Chemistry I and II Lab	1	1
BIO 114 Marine Environments		<u>3</u>
(Freshman Year Total: 34 Hours)	18	16

<b>SOPHOMORE YEAR</b>	<b>F</b>	<b>S</b>
BIO 101 Introduction to Biology	3	
BIOL 101 Biology Lab	1	
MATH 232 Calculus II with Lab	3	
MET 200 Introduction to Meteorology	3	
PHY 211, 212 General Physics I and II	3	3
PHYL 211, 212 General Physics I and II Lab	1	1
SCI 205 Earth & Space Science		3
SCIL 205 Earth & Space Science Lab		1
CSC 118 Computer Programming		3
SCI 215 Global Change	3	
SPCH 201 Speech Arts		3
ENG 205 World Literature		<u>3</u>
(Sophomore Year Total: 34 Hours)	17	17

<b>JUNIOR YEAR</b>	<b>F</b>	<b>S</b>
MET 210 Climatology	3	
SCI 310 Earth History	3	

SCIL 310 Earth History Lab	1	
FR, GR, CHI or SP 101, 102		
Foreign Language I & II	3	3
PHY 241 Introduction to Astronomy	3	
PHIL 301 Introduction to Philosophy		3
GEOG 103 Physical Geography		3
SCI 320 Sedimentary Environments		3
SCI 325 Mineralogy - Petrology		<u>3</u>
(Junior Year Total: 28 Hours)	13	15

<b>SENIOR YEAR</b>	<b>F</b>	<b>S</b>
SCI 410 Oceanography	3	
SCI 415 Geochemistry	2	
SCI 420 Structural Geology	3	
SCI 440 Environments of Africa	3	
SCI 430 Geographic Info. System/RemoteSensing (GIS/RS)		3
MUS 205 or ART 206 Music or Art Appreciation	3	
SCI 425 Environmental Geology		2
SCI 480 Earth Science Seminar		1
SCI 441 Environmental Health in Africa		3
SCI 432 Hydrology		<u>3</u>
(Senior Year Total: 26 Hours)	14	12

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**TOTAL HOURS** **124**

(Minimum Credit Hours required for degree: 122)

**NOTE:** Students must satisfactorily pass the English Proficiency Examination.

**Details of Rationale and Course for Alternate Career Choice Options**

Course options for students who wish to go to medical school:

BIO 112 & BIOL 112 General Biology II and Lab  
 BIO 218 & BIOL 218 Comparative Anatomy and Lab  
 CHEM 241 & CHML 241 Organic Chemistry I and Lab  
 CHEM 242 & CHML 242 Organic Chemistry II and Lab  
 CHEM 431 & CHML 431 Biochemistry

(NOTE: The five (5) courses—20 credit hours—will be recommended for students preparing themselves for medical school. They will take the courses in their junior and senior years. These five (5) courses along with physics and mathematics courses recommended in the curriculum will prepare them well for admission into medical schools in the United States of America.)

Course options for students wishing to go to MBA/ Management as alternate career option: Students will take the following:

MNGT 330 Management of Organization  
 (during fall of junior year)

ECO 211 Macroeconomics  
(during spring of junior year)

ECO 212 Microeconomics  
(during senior year)

MNGT 333 Quantitative Business Analysis  
(during senior year)

MNGT 350 Data Base Management Systems Application  
(during senior year)

MNGT 460 Management Information Systems  
(during senior year)

These six (6) courses along with mathematics and physics courses will prepare them well for MBA degree and management positions in this complicated management and financial world.

Course options for students wishing to go for Physics Teaching in High Schools:

Mississippi and the nation seriously lack physics teachers in high school systems. The education degree programs in universities do not prepare students to take a job as physics teachers in high schools. Mississippi State Department of Education has designed Alternate Route to secure license for teaching in high school. In this career choice option, courses are chosen to meet that requirement. Students will receive a B.S. degree in physics and they will be eligible to secure a teaching license while keeping the option for higher education in physics or in education. The in-depth knowledge that will be gained by the students through mathematics and physics courses in the curriculum will enable them to inspire high school students towards physics and engineering careers in the future. A sound understanding of physics will translate into an innovative and stimulating environment in physics classes in high schools (instead of offering a passive physics course in high schools) in Mississippi. Students will take the following as needed for the alternate route during their junior and senior year:

- EDCI 100 Introduction to Education
- EDFL 203 Foundation of Education
- GUID 215 Human Development Learning
- EDFL 367 Assessment, Measurement, and Evaluation
- EDCI 401 Classroom Management

They may take SCI 205–Earth Science for Teachers –as their sixth (6th) course or may opt to take RE 455 Diagnostic Reading Instruction – or may opt for an internship during their final semester.

All courses listed for students opting for alternate career choices are offered by other departments at Jackson State University. There is no additional cost involved in this revised curriculum. This curriculum will increase bilateral communication between our department and other departments (from which our students will take upper level courses).

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## DEPARTMENT OF TECHNOLOGY

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Dr. Mahmoud Manzoul, Professor and Interim Chair

OFFICE: J. Y. Woodard Building

FACULTY:

Professors H. Shih, P. Yuan; Associate Professor M. Ali, J. L. Buck, J. Ejiwale, M. Omoregie, F. Tuluri; Visiting Faculty Doris McPherson

### OBJECTIVES

The objectives of the Department of Technology are as follows:

- To produce competent technologists with specialized educational experiences that will enable them to become capable of ascertaining managerial, supervisory and production positions in areas such as business, industry, and government.
- To produce students with the capability to perform quality research in the area of technology.
- To produce students with the ability to perform and take leadership roles in local, state, and national arenas.

### Overall Degree Competencies

Upon the completion of the Industrial Technology program, the student will be able to perform the following overall competencies:

- Demonstrate a broad-based general education, with particular strengths in oral and written technical communications, science and math. Display knowledge and skills related to the contemporary technological systems of production and communications.
- Demonstrate knowledge and skills in entry-level technical management, with special emphasis on business organization and management, production planning, quality assurance, industrial organization and industrial safety.
- Exhibit competencies in applying and using technology within a selected technical specialization.
- Apply technological concepts and practices in solving problems related to industry,

within both individual and cooperative team environments.

- Access, evaluate and manage technical and managerial information.
- Interpret the evolution of technology and assess its impacts on contemporary industry and society.

### **Technological Literacy Core Competencies**

Upon the completion of the Industrial Technology program, the student will be able to perform the following technological literacy core competencies:

- Demonstrate a general understanding of technology-its structure, organization, systems, terminology, career opportunities and related professional organizations.
- Apply mathematics and science principles in production and communications systems.
- Describe typical applications and their impact on society of processes used in production and communications systems.
- Demonstrate knowledge of basic computer systems, including identity of typical microcomputer system components as well as potential applications, benefits and limitations.
- Communicate information electronically by encoding, transmitting, channeling, receiving and decoding processes.
- Design and produce effective two-dimensional and three-dimensional messages that use a variety of graphic reproduction processes.
- Perform safely common manufacturing techniques used to cast, form, separate, condition, assemble and finish a variety of production materials.

### **Technology Management Core Competencies**

The technology management option is designed to provide students with both theoretical knowledge and practical skills in management that are essential in the 21st century. Courses included in this option provide experiences in plant layout and materials handling, quality control, motion and time study, inventory control, and labor relationships. Typical entry-level professions include production managers, technical managers, supervisors, and field service representatives.

Upon the completion of the technology management option, the students will be able to:

- Exhibit knowledge of federal and state

safety legislation and identify the role of management in an industrial safety program.

- Recognize, evaluate and control varied industrial health and safety hazards.
- Demonstrate knowledge of traditional management functions and practices, including applications and limitations of various management schemes.
- Perform production scheduling, develop and monitor an inventory control system, utilize appropriate production planning techniques, and identify and exhibit key factors in project management.
- Solve problems in typical industrial organizations, work effectively in teams, and demonstrate knowledge of the managed area of an industrial enterprise.
- Use appropriate statistical techniques in variable and attribute control charts and in sampling tables for continuous improvement.
- Evaluate and/or implement total quality systems in industry.
- Apply business, marketing and economic principles to solve problems.
- Identify responsibility of supervision and management within various industries.
- Demonstrate communication skills, safe and efficient individual and group work habits, leadership within groups and an attitude of cooperation and tolerance.

### **Manufacturing & Design Technology Core Competencies**

The manufacturing & design technology option is designed to provide students with both theoretical knowledge and practical skills in manufacturing systems that are essential in the 21st century. Courses included in this option provide experiences in fundamentals of manufacturing, robotics, programmable logic control (PLC), statistical process control (SPC), and computer integrated manufacturing (CIM). Typical entry-level professions include plant managers, technical managers, supervisors, team leaders and field service representatives.

Upon the completion of the manufacturing & design technology option, the student will be able to:

- analyze, select and use industrial materials for production including polymers, ceramics, metals, woods and composites.
- demonstrate proficiency in the manufacturing processes of casting, forming, separating, conditioning, assembling and finishing.

- program and operate computer numerically controlled (CNC) machine tools that utilized appropriate statistical techniques in variable and attribute control charts with sampling tables.
- employ computer-aided design and computer-aided manufacturing (CAD/CAM) for the design, development and production of manufactured goods.
- demonstrate behavioral patterns that include communication skills, safe and efficient individual and group work habits, leadership within groups, and an attitude of cooperation and tolerance.
- recognize, evaluate and control varied industrial health and safety hazards.
- demonstrate knowledge of traditional management functions and practices, including applications and limitations of various management schemes.
- perform production scheduling, develop and monitor an inventory control system, utilize appropriate production planning techniques, and identify and exhibit key factors in project management.
- analyze, design and specify mechanical, hydraulic and pneumatic operations and their components for specific applications.
- describe the impact of various manufacturing systems on society today.

### **Electronics Technology Core Competencies**

The electronics systems technology option is designed to provide students with both theoretical knowledge and practical skills in electronics/airway systems that are essential in the 21st century. Courses included in this option provide experiences in devices and circuits, digital and instrumentation. Typical entry-level professions include electronics technologists, circuit designers, and electronic systems maintenance supervisors.

Upon the completion of the electronics/airway systems option, the student will be able to:

- use a variety of electronic test equipment such as analog and digital meters, oscilloscopes, frequency counters, power supplies, logic pulsers and probes in order to verify proper circuit operation or to troubleshoot and solve electrical and electronic problems.
- demonstrate knowledge related to DC/AC, digital, power conversion and control, and microprocessor circuits.

- design, create and integrate programmed solutions via PLC and PC for problems associated with process control.
- utilize electromechanical and microprocessor-based systems in order to implement designed solutions associated with process control.
- retrieve and assess electronics and control information from journals, periodicals, technical manuals, component substitution manuals, Internet, and other technical sources.
- describe the impact of various electronic and control systems on society today.
- demonstrate the systematic research and development process in learning and applying current contemporary electronics and control systems technologies.

### **Computer Technology Core Competencies**

The computer technology option is designed to provide students with both theoretical knowledge and practical skills in computer and information technologies. Courses included in this option provide experiences in computer components, networking systems, networking installation and troubleshooting, and operating systems software packages. Graduates of this option typically work as process/product analyst, application analyst, networkers, programmers, or managers of computer operations.

Upon the completion of the computer technology option, the student will be able to:

- be familiar with hardware/software functions and troubleshooting.
- be familiar with network administration and the analysis and evaluation of system outputs.
- demonstrate safe and appropriate use of computer technology employed in the work environment.
- understand how a transformer is constructed and how it operates.
- understand the basic structure and characteristics of a capacitor and an inductor.
- apply knowledge of electrical circuits and concepts through testing, troubleshooting, experimentation and problem solving.
- analyze series, parallel and series-parallel RC circuits.
- analyze series, parallel and series-parallel RL circuits.

- analyze series, parallel and series-parallel RLC circuits.
- determine the bandwidth of resonant circuits.

### Emergency Management Technology

#### Core Competencies

The emergency management technology option focuses on disaster prevention, planning, preparedness, response, mitigation, and recovery. The curriculum covers needs and issues, operations management, planning and response, and terrorism and is designed to provide students with a global outlook, interpersonal skills, and emergency management knowledge and skills. Emergency management is the discipline of dealing with and avoiding risks. It is a discipline that involves preparing for disaster before it occurs. This undergraduate specialization provides an overview of public safety research, theory, and principles within an emergency management framework. The curriculum focuses on such topics as emergency planning and decision-making, homeland security, disaster response and recovery, and hazard identification and mitigation.

### Bachelor of Science: Industrial Technology Major (*Electronics Technology Concentration*)

FRESHMAN YEAR	F	S
UNIV 100 University Success	2	
MATH 111 College Algebra	3	
CSC 115 (C) Digital Computer Principles	3	
FLG 101, 102 Foreign Language Options	3	3
HIST 101, 102 History of Civilization	3	3
ENG 104, 105 Composition	3	3
PE Any 100 Level Activity Sport	1	1
MATH 112 Plane Trigonometry		3
CHEM 141 General Chemistry		3
CHML 141 General Chemistry Lab		<u>1</u>
(Freshman Year Total: 35 Hours)	18	17

SOPHOMORE YEAR	F	S
IT 100 Introduction to Technology	1	
ITE 111 Basic Electronics	3	
ITEL 111 Basic Electronics Lab	1	
ENG 205 World Literature	3	
SPCH 201 Speech Arts	3	
ITMA 105 Industrial Safety Management	3	
ITD 114 Computer Aided Design	3	
PHY 201 Basic Physics I		3
PHYL 201 Basic Physics I Lab		1
ENG 213 Professional Writing		3
MATH 221 Calculus I Industrial or Business		3
ITE 112 Intermediate Electronics		3
ITEL 112 Intermediate Electronics Lab		<u>1</u>
(Sophomore Year Total: 31 Hours)	17	14

JUNIOR YEAR	F	S
ITE 221 Devices and Circuits	3	
ITEL 221 Devices and Circuits Lab	1	
ITMA 325 (W) Industrial Psychology	3	
ART 206 Art Appreciation	3	
MNGT 350 Business Computer Applications	3	
ECO 211 Principles of Macroeconomics	3	
ITE 338 Digital Logic		3
ITEL 338 Digital Logic Lab		1
IT 300 (S) Internship/Industrial Experience		3
ITD 316 Electronics Design		3
PHIL 301 Introduction to Philosophy		3
ELEC Electives		<u>1</u>
(Junior Year Total: 30 Hours)	16	14

SENIOR YEAR	F	S
ITE 438 PLC	3	
ITE 449 Network Theories	3	
ITEL 449 Network Lab	1	
ITE 452 Fiber Optics and Communications	3	
ITC 400 (W) Technical Writing		3
ITE 475 Microprocessor Software/Hardware	3	
ITMA 410 First Line Supervision	3	
ITE 450 Telecomm Systems		3
ITMA 420 (W) Labor & Industrial Relations		3
IT 490 (S) Senior capstone		<u>3</u>
(Senior Year Total: 28 Hours)	19	9

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**TOTAL HOURS** **124**

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### Bachelor of Science: Industrial Technology Major (*Computer Technology Concentration*)

FRESHMAN YEAR	F	S
UNIV 100 University Success	2	
MATH 111 College Algebra	3	
CSC 115 (C) Digital Computer Principles	3	
FLG 101, 102 Foreign Language Options	3	3
HIST 101, 102 History of Civilization	3	3
ENG 104, 105 Composition	3	3
PE Any 100 Level Activity Sport	1	1
MATH 112 Plane Trigonometry		3
CHEM 141 General Chemistry		3
CHML 141 General Chemistry Lab		<u>1</u>
(Freshman Year Total: 35 Hours)	18	17

SOPHOMORE YEAR	F	S
IT 100 Introduction to Technology	1	
ITE 111 Basic Electronics	3	
ITEL 111 Basic Electronics Lab	1	
ENG 205 World Literature	3	
SPCH 201 Speech Arts	3	
ITMA 105 Industrial Safety Management	3	

ITD 114 Computer Aided Design	3	
ITE 112 Intermediate Electronics	3	
ITEL 112 Intermediate Electronics Lab	1	
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
ENG 213 Professional Writing	3	
MATH 221 Calculus I Industrial or Business	<u>3</u>	
(Sophomore Year Total: 31 Hours)	17	14

**JUNIOR YEAR**

	<b>F</b>	<b>S</b>
ITE 221 Devices and Circuits	3	
ITEL 221 Devices and Circuits Lab	1	
ITMA 325 (W) Industrial Psychology	3	
ART 206 Art Appreciation	3	
MNGT 350 Business Computer Applications	3	
ECO 211 Principles of Macroeconomics	3	
ITE 338 Digital Logic	3	
ITEL 338 Digital Logic Lab	1	
IT 300 (S) Internship/Industrial Experience	3	
PHIL 301 Introduction to Philosophy	<u>3</u>	
(Junior Year Total: 26 Hours)	16	10

**SENIOR YEAR**

	<b>F</b>	<b>S</b>
ITE 449 Network Theories	3	
ITEL 449 Network Lab	1	
ITE 452 Fiber Optics and Communications	3	
ITE 465 (W) Microprocessor and Application	3	
ITC 400 (W) Technical Writing	3	
ITE 475 Microprocessor Software/Hardware	3	
ITE 466 Microprocessor and Troubleshooting	3	
ITE 476 Real Time System Design	3	
ITMA 410 First Line Supervision	3	
ITMA 420 (W) Labor & Industrial Relations	3	
IT 490 (S) Senior Capstone	<u>3</u>	
(Senior Year Total: 31 Hours)	19	12

**TOTAL HOURS** 124

**Bachelor of Science: Industrial Technology Major**  
**(Emergency Management Technology Concentration)**

**FRESHMAN YEAR**

	<b>F</b>	<b>S</b>
UNIV 100 University Success	2	
MATH 111 College Algebra	3	
CSC 115 (C) Digital Computer Principles	3	
FLG 101,102 Foreign Language Options	3	3
HIST 101,102 History of Civilization	3	3
ENG 104,105 Composition	3	3
PE Any 100 Level Activity Sport	1	1
MATH 112 Plane Trigonometry	3	
BIO 101 Intro to Biological Science	2	
BIOL 101 Intro to Biological Science Lab	<u>1</u>	
(Freshman Year Total: 34 Hours)	18	16

**SOPHOMORE YEAR**

	<b>F</b>	<b>S</b>
IT 100 Introduction to Technology	1	
ART 206 Art Appreciation		3
ENG 201H Humanities		3
ENG 205 World Literature		3
PSY 201 General Psychology	3	
SPCH 201 Speech Arts	3	
ITMA 105 Industrial Safety Management	3	
ITD 114 Computer Aided Design	3	
CHEM 141 General Chemistry	3	
CHML 141 General Chemistry Lab	1	
ENG 213 Professional Writing		3
MATH 221 Calculus I Industrial or Business		3
PHIL 301 Introduction to Philosophy	<u>3</u>	
(Sophomore Year Total: 35 Hours)	17	18

**JUNIOR YEAR**

	<b>F</b>	<b>S</b>
ECO 211 Principles of Macroeconomics		3
PHY 201 Physics I	3	
PHYL 201 Physics I Lab	1	
ITEM 301 Prin of Emergency Management	3	
ITEM 302 Intro to Incident Management	3	
ITEM 303 Comm Emergency Response Team	3	
ITEM 304 Internship	3	
ITEM 401 Application to EM Technology	3	
ITMA 325 (W) Industrial Psychology	3	
ITHM 300 (S) Principles of HMM	3	
ITHM 301 Regulatory Framework	<u>3</u>	
(Junior Year Total: 31 Hours)	16	15

**SENIOR YEAR**

	<b>F</b>	<b>S</b>
ITEM 402 Basic GIS & Remote Sensing	3	
ITEM 403 Disaster Management	3	
ITEM 404 Special Project	3	
ITMA 420 (W) Labor & Industrial Relations	3	
ITHM 302 Tech Treatment of HM	3	
ITHM 402 Industrial Hygiene	3	
ITHM 405 Risk Assessment	3	
Elective	<u>3</u>	
(Senior Year Total: 24 Hours)	12	12

**TOTAL HOURS** 124

**Bachelor of Science: Industrial Technology Major**  
**(Manufacturing and Design Technology Concentration)**

**FRESHMAN YEAR**

	<b>F</b>	<b>S</b>
UNIV 100 University Success	2	
MATH 111 College Algebra	3	
CSC 115 (C) Digital Computer Principles	3	
FLG 101, 102 Foreign Language Options	3	3
HIST 101, 102 History of Civilization	3	3
ENG 104, 105 Composition	3	3
PE Any 100 Level Activity Sport	1	1

MATH 112 Plane Trigonometry	3
CHEM 141 General Chemistry	3
CHML 141 General Chemistry Lab	<u>1</u>
(Freshman Year Total: 35 Hours)	18 17

**SOPHOMORE YEAR**

	F	S
IT 100 Introduction to Technology	1	
ITD 114 Computer Aided Design	3	
ITMA 105 Industrial Safety Management	3	
ITMF 206 Intro. To Manufacturing Processes	3	
ENG 205 World Literature	3	
ELEC Electives	3	
PHY 201 Basic Physics I		3
PHYL 201 Basic Physics I Lab		1
SPCH 201 Speech Arts		3
ITD 203 Adv. Computer-Aided Design		3
ENG 213 Professional Writing		3
MATH 221 Calculus I Industrial or Business		<u>3</u>
(Sophomore Year Total: 32 Hours)	16	16

**JUNIOR YEAR**

	F	S
ITD 327 Machine Design	3	
ITMF 339 Materials Testing	3	
ITMA 325W Industrial Psychology	3	
ART 206 Art Appreciation	3	
ECO 211 Principles of Macroeconomics	3	
MNGT 350 Business Computer Applications		3
ITMF 340 Hydraulics & Fluid Power Systems		3
IT 300 (S) Internship/Industrial Experience		3
PHIL 301 Introduction to Philosophy		<u>3</u>
(Junior Year Total: 27 Hours)	15	12

**SENIOR YEAR**

	F	S
ITMF 410 Computer Numerical Control	3	
ITC 400 (W) Technical Writing	3	
ITMF 425 Robotics	3	
ETD 361 Statics	3	
ITMA 423 Motion and Time Study	3	
ITMA 410 First Line Supervision	3	
ETD 362 Material Mechanics		3
ITMA 420 (W) Labor & Industrial Relations		3
ITMA 425 Plant Layout		3
IT 490 (S) Senior capstone		<u>3</u>
(Senior Year Total: 30 Hours)	18	12

**TOTAL HOURS** 124

Recommended Electives:	Hours:
ITD 411 Engineering Drawing	3
ITE 438 PLC	3
ITMF 420 Advanced Manufacturing Technology	3
ITMF 430 Factory Automation	3

**Bachelor of Science: Industrial Technology Major  
(Technology Management Concentration)**

**FRESHMAN YEAR**

	F	S
UNIV 100 University Success	2	
MATH 111 College Algebra	3	
CSC 115 (C) Digital Computer Principles	3	
FLG 101, 102 Foreign Language Options	3	3
HIST 101, 102 History of Civilization	3	3
ENG 104, 105 Composition	3	3
PE Any 100 Level Activity Sport	1	1
MATH 112 Plane Trigonometry		3
CHEM 141 General Chemistry		3
CHML 141 General Chemistry Lab		<u>1</u>
(Freshman Year Total: 35 Hours)	18	17

**SOPHOMORE YEAR**

	F	S
IT 100 Introduction to Technology	1	
ITD 114 Computer Aided Design	3	
ITMA 105 Industrial Safety Management	3	
PHY 201 Basic Physics I	3	
PHYL 201 Basic Physics I Lab	1	
ITMF 206 Intro. To Manufacturing Processes	3	
ENG 205 World Literature	3	
SPCH 201 Speech Arts		3
MNGT 350 Business Computer Applications		3
ENG 213 Professional Writing		3
MATH 221 Calculus I Industrial or Business		3
ELEC Electives		<u>3</u>
(Sophomore Year Total: 32 Hours)	17	15

**JUNIOR YEAR**

	F	S
ITMA 328 American Industry	3	
ITMA 325W Industrial Psychology	3	
ART 206 Art Appreciation	3	
ECO 211 Principles of Macroeconomics	3	
ITHM 300 Principles of Hazardous Mat. Mgnt	3	
ITHM 301 Regulatory Framework		3
ITHM 302 Tech. Treatment of Hazardous Matrl		3
IT 300 (S) Internship/Industrial Experience		3
PHIL 301 Introduction to Philosophy		<u>3</u>
(Junior Year Total: 27 Hours)	15	12

**SENIOR YEAR**

	F	S
ITHM 402 Industrial Hygiene	3	
ITHM 405 Rick Assessment	3	
ITMA 411 Production & Inventory Managemnt	3	
ITC 400 (S) Technical Writing	3	
ITMA 423 Motion and Time Study	3	
ITMA 410 First Line Supervision	3	
ITMA 420 (W) Labor & Industrial Relations		3
ITMA 424 Quality Control		3

ITMA 425 Plant Layout	3
IT 490 (S) Senior capstone	<u>3</u>
(Senior Year Total: 30 Hours)	18 12
<b>TOTAL HOURS</b>	<b>124</b>

**Recommended Electives:**

GIS 200 Elementary Surveying & GIS	3
GIS 210 Digital Imaging & Orthography	3
GIS 300 Lidar Mapping	3
GIS 400 Global Positioning Systems	3