DEPARTMENT OF CHEMISTRY

Dr. Hongtao Yu
Associate Professor and Department Chair
OFFICE: John A. Peoples Science Building 414

FACULTY:

Full-Professors:	Ken S. Lee, Jerzy Leszczynski, Eric Noe, Hiroyasu Tachikawa, John Watts, Jeff Zubkowski
Associate Professors:	Naomi Campbell, Ming-Ju Huang, Yinming Liu, Ramaiyer Venkatraman, Hongtao Yu
Assistant Professors:	Zikri Arslan, Ruomei Gao, Glake Hill, Ashton Hamme, Alamgir Hossain, Paresh Ray
Instruction Personnel:	Drs. Leonid Gorb, Troy Milliken, Elizabeth Milner, Dorothy Wood

OBJECTIVES

To provide students with high quality educational programs with knowledge necessary for success in graduate schools, professional schools, industrial or government laboratories.

1. To prepare students for graduate study and research.
2. To maintain excellent research programs.
3. To provide services to the community and the state.
4. To promote the professional growth and development of the faculty.

The Department of Chemistry offers the Bachelor of Science degree with and without American Chemical Society Certification, and 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.

CURRICULUM OPTIONS AND REQUIREMENTS:

Bachelor of Science in Chemistry

Certified by the American Chemical Society (129 hours)

FRESHMAN YEAR		**F**	**S**
CHEM 141,142	General Chemistry + Lab	3+1	3+1
ENG 104,105	Composition	3	3
BIO 111	General Biology + Lab	3+1	
CSC 115	Digital Computer Principles		3
UNIV 100	University Success	2	

MATH 231	Calculus I + Lab		3+1
HIST 101,102	History of Civilization	3	3
(Freshman Year Total: 33 Hours)		16	17

SOPHOMORE YEAR

CHEM 241,242	Organic Chemistry + Lab	4	4
MATH 232	Calculus II + Lab	4	
PHY 211,212	General Physics + Lab	4+1	4+1
ENG 205	World Literature	3	
CHEM 243	Qualitative Org. Analysis + Lab		2+1
ENG xxx	English Option		3
PE xxx	Physical Education Options	1	1
(Sophomore Year Total: 33 Hours)		17	16

JUNIOR YEAR

CHEM 320	Analytical Chemistry + Lab	3+1	
CHEM 341, 342	Physical Chemistry + Lab	3+1	3+1
CHEM 340	Inorganic Chemistry I	2	
CHEM 381,382	Chemistry Seminar	.5	.5
MFL 101,102	Modern Foreign Language	3	3
MATH 233	Calculus III + Lab	3+1	
PSY 201	General Psychology		3
CORE II	Core II Option	3	
(Junior Year Total: 31 Hours)		15.5	15.5

SENIOR YEAR

CHEM 380	Independent Study	1	1
CHEM 441	Inorganic Chemistry II + Lab	3+1	
CHEM 421	Instrumentation + Lab		3+1
CHEM 431	Biochemistry	3	
CHEM 481,482	Chemistry Seminar	.5	.5
CHEM xxx	Advanced Chemistry Course	3	
SPCH xxx	Speech Option	3	
CORE II	Core II Option (A)	3	3
PHIL xxx	Philosophy Option		3
Elective	Elective Option	3	
(Senior Year Total: 32 Hours)		17.5	14.5

Advanced Chemistry Courses: One (1) of the following courses: CHEM 736 (Physical Organic), CHEM 738 (Organic Synthesis), CHEM 758(Quantum Chemistry),
ENV 701(Environmental Chemistry)

CORE II OPTIONS: (All students must complete)

A. Social/Behavioral Science or Fine Arts/Humanities–One (1) of the following: SS 201, 202, SOC 214, 325, PS 334, 335, 336, GEO 105, 209, ECO 211, or 212.
Two (2) of the following: ART 206, DR 201, MUS 205, ENG 201H, or 309, PHIL 416.

B. Philosophy Options: One (1) of the following: PHIL 301, 308, 309, or 416.

C. Speech Options: One (1) of the following: SPCH 201, 216, 300, 334, 335, or 430.

Bachelor of Science in Chemistry

Pre-Medical, Pre-Dental, Pre-Pharmacy (129 Hours)

FRESHMAN YEAR		**F**	**S**
CHEM 141, 142	General Chemistry + Lab	3+1	3+1
ENG 104,105	Composition & Literature	3	3
BIO 111,112	General Biology + Lab	3+1	3+1
HIST 101,102	History of Civilization	3	3
UNIV 100	University Success	2	
	Core II Option		3
(Freshman Year Total: 33 Hours)		16	17

SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
MATH 231	Calculus I + Lab	3+1	
CHEM 243	Qual. Organic Analysis + Lab		2+1
SPCH xxx	Speech Option	3	
ENG 205	World Literature	3	
ENG xxx	English Option		3
CORE II	Core II Option		3
PE xxx	Physical Education Option	1	
CSC 115	Digital Computer Principles		3
(Sophomore Year Total: 31 Hours)		15	16

JUNIOR YEAR		**F**	**S**
CHEM 320	Analytical Chemistry+ Lab	3+1	
CHEM 340	Inorganic Chemistry I		2
CHEM 381, 382	Chemistry Seminar	.5	.5
PHY 201,202	Basic Physics + Lab	3+1	3+1
MFL 101,102	German of French	3	3
CHEM xxx	Chemistry Options	3	3
CHEM 380	Independent Study	1	1
PSY 201	General Psychology		3
PE xxx	Physical Education Option	1	
(Junior Year Total: 33 Hours)		16.5	16.5

SENIOR YEAR		**F**	**S**
CHEM 341	Physical Chemistry + Lab	3+1	
BIO 313	Microbiology		3
CHEM 431	Biochemistry	3	
CHEM 481, 482	Chemistry Seminar	.5	.5
CHEM xxx	Chemistry Option		3
	Core II Option	3	
	Electives	6	6
PHIL	Philosophy Option		3
(Senior Year Total: 32 Hours)		16.5	15.5

Chemistry Options: At least one (1) of the following:
CHEM 342, Physical Chemistry; CHEM 421, Instrumentation; CHEM 441, Inorganic Chemistry II
Pre-Medicine: At least two (2) of the following courses: BIO 218, 318, 440, 441, and 470.
Pre-Pharmacy: BIO 318 and BIO 470.

Bachelor of Science in Chemistry

Biomedical Science Concentration (132 hrs)

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

SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
MATH 231	Calculus I + Lab	3+1	
CHEM 243	Qual. Organic Analysis + Lab		2+1
PHIL	Philosophy Option		3
SPCH	Speech Option	3	
ENG 205	World Literature	3	
ENG	English Option		3
	Physical Education		1
	CORE II Option	3	3
(Sophomore Year Total: 34 Hours)		17	17

JUNIOR YEAR		**F**	**S**
CHEM 320	Analytical Chemistry + Lab	3+1	
PHY 201, 202	Basic Physics + Lab	3+1	3+1
MFL 101, 102	Language	3	3
CHEM 381, 382	Chemistry Seminar	.5	.5
PE	Physical Education	1	
CHEM 341	Physical Chemistry + Lab	3+1	
CHEM 340	Inorganic Chemistry I		2
CHEM 310	Introduction to Research		2
CHEM 380	Independent Study	1	
BIO	Biomed Option + Lab		3+1
(Junior Year Total: 33 Hours)		16.5	16.5

SENIOR YEAR		**F**	**S**
CHEM 431,432	Biochemistry + Lab	3+1	3+1
CHEM 481, 482	Chemistry Seminar	.5	.5

CHEM 421	Instrumentation + Lab		3+1
BIO	Biomed Option + Lab		3+1
PSY 201	General Psychology	3	
BIO	Biomed Option	3	
	CORE II Option	3	
	Elective	6	
(Senior Year Total: 32.0 Hours)		17.5	14.5

Biomedical Science Option (three of the following, two of which must have labs): BIO 234 (Human Anatomy & Physiology), BIO 313 & BIOL 313 (Intro Microbiology), BIO 318& BIOL 318 (Intro Genetics), BIO 440 & BIOL 440 (Cell Biology), BIO 409 (General Genetics).

Bachelor of Science in Chemistry

Forensic Science Concentration (126 Hours)

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

SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
MATH 231	Calculus I + Lab	3+1	
MATH 271	Elementary Statistics		3
SPCH	Speech Option	3	
PSY 201	General Psychology		3
ENG 205	World Literature	3	
ENG	English Option		3
	Physical Education		1
	CORE II Option	3	3
(Sophomore Year Total: 34 hours)		17	17

JUNIOR YEAR		**F**	**S**
CHEM 320	Analytical Chemistry + Lab	3+1	
PHY 201, 202	Basic Physics + Lab	3+1	3+1
MFL 101, 102	Foreign Language	3	3
CHEM 381, 382	Chemistry Seminar	.5	.5
PE	Physical Education	1	
CHEM 340	Inorganic Chemistry I		2
CHEM 371	Forensic Chemistry + Lab		3+1
BIO	Microbiology		3
	CORE II Option	3	

(Junior Year Total: 31 Hours)		15.5	15.5
SENIOR YEAR		**F**	**S**
CHEM 341	Physical Chemistry + Lab	3+1	
CHEM 481, 482	Chemistry Seminar	.5	.5
PHIL	Philosophy Option	3	
CJ 324	Intro. Criminal Justice	3	
CHEM 431	Biochemistry I + Lab	3+1	
CHEM 471	Forensic Toxicology		3
CHEM 475	Forensic Practicum		3
CHEM 421	Instrumentation + Lab		3+1
CJ 443	Found. Crim. Investigation		3
(Senior Year Total: 28 Hours)		14.5	13.5

Bachelor of Science in Chemistry

Environmental Sciences Concentration (129 Hours)

FRESHMAN YEAR		**F**	**S**
CHEM 141, 142	General Chemistry + Lab	3+1	3+1
ENG 104, 105	Composition & Literature	3	3
BIO 111, 112	General Biology + Lab	3+1	3+1
HIST 101, 102	History of Civilization	3	3
UNIV 100	University Success	2	
CSC 115	Digital Computer Principles		3
(Freshman Year Total: 33 Hrs.)		16	17
SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
MATH 231	Calculus I + Lab	3+1	
CHEM 243	Qual. Organic Analysis + Lab		2+1
PHIL	Philosophy Option		3
SPCH	Speech Option	3	
ENG 205	World Literature	3	
ENG	English Option		3
	Physical Education		1
	CORE II Option	3	3
(Sophomore Year Total: 34 Hours)		17	17
JUNIOR YEAR		**F**	**S**
CHEM 320	Analytical Chemistry + Lab	3+1	
PHY 201, 202	Basic Physics + Lab	3+1	3+1
MFL 101, 102	Language	3	3
CHEM 381, 382	Chemistry Seminar	.5	.5
PE	Physical Education	1	
CHEM 341	Physical Chemistry + Lab	3+1	

CHEM 340	Inorganic Chemistry I		2
CHEM 310	Introduction to Research		2
BIO	Biology Option + Lab		3+1
(Junior Year Total: 32 Hours)		16.5	15.5

SENIOR YEAR		**F**	**S**
CHEM 431	Biochemistry + Lab	3+1	
CHEM 481, 482	Chemistry Seminar	.5	.5
PSY 201	General Psychology		3
CHEM 410	Environmental Chem. + Lab	3+1	
CHEM 421	Instrumentation + Lab		3+1
BIO	ENV Option + Lab	3+1	
CHEM 470	Introduction to Toxicology		3
CHEM 380	Independent Study		1
	Elective	3	3
(Senior Year Total: 30 Hours)		15.5	14.5

Environmental Science Options (two of the following): BIO 201 & BIOL 201(Intro duction to Environmental Sciences); BIO 403 & BIOL 403 (Human Environments and Natural Systems); BIO 404 & BIOL 404 (Introduction to Environmental Science).

Bachelor of Science in Chemistry

Without ACS Certification (130 Hours)

FRESHMAN YEAR		**F**	**S**
CHEM 141, 142	General Chemistry + Lab	3+1	3+1
ENG 104,105	Composition	3	3
MATH xxx	Mathematics Options	3	3
BIO 111	General Biology + Lab	3+1	
UNIV 100	University Success	2	
SPCH xxx	Speech Option		3
CSC 115	Digital Computer Principles		3
(Freshman Year Total: 32 Hours)		16	16

SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
MATH 231	Calculus I + Lab	3+1	
HIST 101,102	History of Civilization	3	3
ENG 205	World Literature	3	
CORE II	Core II Options	3	3
CHEM 243	Qual. Organic Anal. + Lab		2+1
ENG xxx	English Option		3
PE xxx	Physical Education Option		1
(Sophomore Year Total: 34 Hours)		17	17

JUNIOR YEAR	**F**	**S**

CHEM 320	Analytical Chemistry + Lab	3+1	
CHEM 340	Inorganic Chemistry I		2
CHEM 381, 382	Chemistry Seminar	.5	.5
PHY 201,202	Basics Physics + Lab	3+1	3+1
MFL 101,102	Modern Foreign Language	3	3
PE xxx	Physical Education Option	1	
PHIL xxx	Philosophy Option	3	
PSY 201	General Psychology		3
	Core II Option		3
(Junior Year Total: 31 Hours)		15.5	15.5

SENIOR YEAR		**F**	**S**
CHEM 341	Physical Chemistry + Lab	3+1	
CHEM 421	Instrumentation + Lab		3+1
CHEM 481, 482	Chemistry Seminar	.5	.5
CHEM xxx	Chemistry Opt. (or elective)	3	3
	Elective Options	9	9
(Senior Year Total: 33 Hours)		16.5	16.5

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

Math Options: Two of the following: MATH 111, MATH 112, or MATH 118, MATH 232, MATH 233. 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 231in the freshman year, MATH 111, 112, or 118 are not required, rather, the student can take MATH 232, MATH 233, or other elective courses as options

Bachelor of Science in Chemistry

Pre-Chemical Engineering (101 Hours)

FRESHMAN YEAR		**F**	**S**
CHEM 141, 142	General Chemistry + Lab	3+1	3+1
ENG 104,105	Composition	3	3
MATH 231, 232	Calculus I & II + Lab	3+1	3+1
BIO 111	General Biology + Lab	3+1	
CSC 115	Digital Computer Principles		3
UNIV 100	University Success	2	
PE 100	Physical Education		1
(Freshman Year Total: 33 Hours)		17	15

SOPHOMORE YEAR		**F**	**S**
CHEM 241, 242	Organic Chemistry + Lab	3+1	3+1
PHY 211,212	General Physics + Lab	4+1	4+1
MATH 233	Calculus III + Lab	3+1	
CHEM 243	Qual. Organic Anal. + Lab		2+1
ENG 205	World Literature	3	

ENG xxx	English Option		3
PE xxx	Physical Education	1	
MATH 368	Differential Equations I		3
(Sophomore Year Total: 35 Hours)		17	18

JUNIOR YEAR		**F**	**S**
CHEM 341, 342	Physical Chemistry + Lab	3+1	3+1
CHEM 320	Analytical Chemistry + Lab	3+1	
CHEM 753	Thermodynamics		3
CHEM 381, 382	Chemistry Seminar	.5	.5
HIST 101,102	History of Civilization	3	3
FLG 101,102	Modern Foreign Language	3	3
CORE II	Core II Option		3
PSY 201	General Psychology	3	
(Junior Year Total: 34 Hours)		17.5	16.5

SENIOR YEAR

If the student also wants a B.S. Degree in Chemistry from Jackson State University, courses equivalent to the following must be completed at the collaborating School of Engineering or during a Jackson State Summer Session.

Speech Option	3.0
Philosophy Option	3.0
Social/Behavioral Science Option	6.0