

School of

MATHEMATICS AND NATURAL SCIENCES

MAJORS

- Chemistry (ACS-Certified Chemistry) BS
- Chemistry (Biochemistry) BS
- Chemistry (Chemistry Education) BS
- Medicinal and Pharmaceutical Chemistry BA
- Mathematics (Mathematics Education) BS
- Mathematics BS
- Physics (Physics Education) BS
- Physics BS

MINORS

- Chemistry Minor
- Mathematics Minor
- Physics Minor

CONTACT US

 6601.266.4934

 usm.edu/mathematics-natural-sciences

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Post-secondary students in the State of Mississippi often choose to attend a Mississippi community college (MS CC) and earn an associate degree before transferring to The University of Southern Mississippi to complete their bachelor's degree. To make this transition as smooth as possible and to ensure no credits are lost, we have created this transfer guide. In most, but not all, cases, students may complete a bachelor's degree in what we refer to as a '2+2' format:

2 years at a MS CC for an associate degree, which includes general education coursework

+

2 years at USM to complete the bachelor's degree

Please use the key below to determine which courses you must, should, or could take at a Mississippi community college before transferring to Southern Miss.

KEY



 MUST	Students who do not complete these requirements at a MS CC cannot complete their bachelor's degree in the 2+2 format.
 SHOULD	Students should complete these requirements at a MS CC in order to have the smoothest transition to Southern Miss. It may still be possible to complete a bachelor's degree in the 2+2 format without taking these courses, but it will be challenging.
 COULD	Students could complete these requirements at a MS CC if they desire. Not taking these courses prior to transferring will not affect a student's ability to complete their bachelor's degree in the 2+2 format.
 CALCULUS READINESS	Calculus is required on this degree plan. Students should arrive at Southern Miss ready to take Calculus I, which means they must have completed Trigonometry or have a Math ACT subscore ≥ 26 . Students may complete Calculus I prior to transferring if they desire.



NOTE: *This document is intended as a guide; it does not guarantee graduation in the 2+2 format. Degree requirements are subject to change. Please consult the school of your desired major for up-to-date requirements.*

Additional majors are available from the other Southern Miss colleges.

College of Education & Human Sciences

Hattiesburg 601.266.4568

Gulf Park 228.214.3340

College of Nursing & Health Professions

Hattiesburg 601.266.5445

AskCNHP@usm.edu

College of Business & Economic Development

Hattiesburg 601.266.4659

Gulf Park 228.214.3447

business@usm.edu



THE UNIVERSITY OF
SOUTHERN
MISSISSIPPI

CHEMISTRY

CHEMISTRY (ACS-CERTIFIED), CHEMISTRY EDUCATION, BIOCHEMISTRY,
MEDICINAL AND PHARMACEUTICAL CHEMISTRY



PROGRAM INFO

Chemistry helps us understand what things are made of and how they work—whether they're living, non-living, natural, or man-made. It also leads to exciting careers in medicine, environmental science, the military, and industries like food, cosmetics, and pharmaceuticals.

Students explore five main areas of chemistry:

- Analytical Chemistry – how we identify and measure substances
- Biochemistry – the chemistry of living things
- Inorganic Chemistry – reactions of elements and minerals
- Organic Chemistry – chemistry of life and making new materials
- Physical Chemistry – how and why chemical reactions happen

Those studying Chemistry Education also learn how to teach science in effective ways.

CAREER OUTLOOK

According to the U.S. Bureau of Labor Statistics, jobs for chemists are expected to grow by 7% from 2020 to 2030. Chemistry majors often pursue careers in research, environmental science, healthcare, and education.

Many work for government agencies like the EPA, FDA, or Department of Defense. A chemistry degree is also a strong foundation for medical, dental, or pharmacy school.



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RESEARCH AT USM

In addition to classroom learning, chemistry students perform cutting-edge research. USM faculty invite students to obtain valuable experience by participating in their research agendas, which helps students advance their future careers.



SCHOLARSHIPS

There are more than a dozen program-specific scholarships available each year. Students should apply through the "Golden Opportunities" GO System.

KNOWLEDGE & SKILLS

Coursework in Chemistry fosters an understanding of matter and its properties.

Chemists are skilled in:

- Analysis
- Problem-solving
- Oral and written communication
- Collaboration
- Laboratory techniques

Chemistry has applications in many fields, including medicine, engineering, environmental science, and material science. Studying chemistry creates a solid foundation in these interdisciplinary areas and prepares students for a wide range of experiences after graduation.

CHEMISTRY BS **2+2** (Page 1/2)

(ACS Certified, Biochemistry, or Chemistry Education)

usm.edu/admissions/apply

Complete all requirements for a MS community college associate degree, including general education coursework, and...

 **MUST**

Take Chemistry I & II and Organic Chemistry I & II to ensure Junior standing after transfer.

 **CALCULUS
READINESS**

Pass MAT 1323 Trigonometry (MAT 103 at Southern Miss) or have a Math ACT subscore ≥ 26 .

 **SHOULD**

Take the emphasis-specific courses on page two if selecting an emphasis area.

 **COULD**

Take Calculus I & II. Complete a Physics I & II sequence either with or without calculus.

CHECKLIST

COURSES

Updated August 2025

	Courses at Community College	Equivalent Courses at Southern Miss
☐	 CHE 1213 and CHE 1211 (or CHE 1214)	CHE 106/L General Chemistry I Lecture and Laboratory
☐	 CHE 1223 and CHE 1221 (or CHE 1224)	CHE 107/L General Chemistry II Lecture and Laboratory
☐	 CHE 2423 and CHE 2421 (or CHE 2424)	CHE 255/L Organic Chemistry I Lecture and Laboratory
☐	 CHE 2433 and CHE 2431 (or CHE 2434)	CHE 256/L Organic Chemistry II Lecture and Laboratory
☐	 MAT 1613 or MAT 1815	MAT 167 Calculus I
☐	 MAT 1623 or MAT 1825	MAT 168 Calculus II
☐	 PHYSICS I & II (Select 1 sequence) Algebra & Trigonometry-based PHY 2413 and PHY 2411 (or PHY 2414) and PHY 2423 and PHY 2421 (or PHY 2424) OR Calculus-based PHY 2513 and PHY 2511 (or PHY 2514) and PHY 2523 and PHY 2521 (or PHY 2524)	PHY 111/L General Physics I Lecture and Laboratory PHY 112/L General Physics II Lecture and Laboratory PHY 201/L General Physics I w/ Calculus Lecture and Lab PHY 202/L General Physics II w/ Calculus Lecture and Lab



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CHEMISTRY BS

2+2

(Page 2/2)

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(ACS Certified, Biochemistry, or Chemistry Education)

Complete all requirements for a MS community college associate degree, including general education coursework, and...



*** MUST**

Take Chemistry I & II and Organic Chemistry I & II to ensure Junior standing after transfer.

**fx CALCULUS
READINESS**

Pass MAT 1323 Trigonometry (MAT 103 at Southern Miss) or have a Math ACT subscore ≥ 26 .

👍 SHOULD

Take the emphasis-specific courses below if selecting an emphasis area.

💡 COULD

Take Calculus I & II. Complete a Physics I & II sequence either with or without calculus.

CHECKLIST

COURSES

Updated August 2025

	Courses at Community College	Equivalent Courses at Southern Miss
☐	BIOCHEMISTRY	
☐	BIO 1133 and BIO 1131 (or BIO 1134)	BSC 110/L Principles of Biological Science I Lecture and Lab
☐	BIO 1143 and BIO 1141 (or BIO 1144)	BSC 111/L Principles of Biological Science II Lecture and Lab
☐	BIO 2923 and BIO 2921 (or BIO 2924)	BSC 282/L General Microbiology Lecture and Laboratory
☐	CHEMISTRY EDUCATION	
☐	BIO 1133 and BIO 1131 (or BIO 1134)	BSC 110/L Principles of Biological Science I Lecture and Lab
☐	BIO 1143 and BIO 1141 (or BIO 1144)	BSC 111/L Principles of Biological Science II Lecture and Lab
☐	HIS 1113 or HIS 1163	HIS 101 World Civilizations: Beginnings to 1500 C.E.
☐	HIS 1123 or HIS 1173	HIS 102 World Civilizations: 1500 to the Present
☐	PSY 1513 General Psychology	PSY 110 General Psychology



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MEDICINAL AND PHARMACEUTICAL CHEMISTRY **2+2** (Page 1/2)



*** MUST**

Take General Chemistry I and II, Organic Chemistry I, as well as General Psychology and Principles of Sociology for GEC 05.

**fx CALCULUS
READINESS**

Pass MAT 1313 (College Algebra, MAT 101 at Southern Miss) or MAT 1323 (Trigonometry), (MAT 103 at Southern Miss) or have a Math ACT subscore ≥ 24 .

👍 SHOULD

Take General Biology I and II, one sophomore level Biology (Microbiology or Human Anatomy & Physiology), and Physics I.

💡 COULD

Elementary Organic Chemistry, a macro or microeconomics course, or one foreign language sequence.

CHECKLIST

COURSES

Updated August 2025

	Courses at Community College	Equivalent Courses at Southern Miss
☐	* CHE 1213 and CHE 1211 (or CHE 1214)	CHE 106/L General Chemistry I Lecture and Laboratory
☐	* CHE 1223 and CHE 1221 (or CHE 1224)	CHE 107/L General Chemistry II Lecture and Laboratory
☐	* CHE 2423 and CHE 2421 (or CHE 2424)	CHE 255/L Organic Chemistry I Lecture and Laboratory
☐	* PSY 1513 General Psychology	PSY 110 General Psychology
☐	* SOC 2113 Introduction to Sociology	SOC 101 Understanding Society: Principles of Sociology
☐	👍 BIO 1133 and BIO 1131 (or BIO 1134)	BSC 110/L Principles of Biological Science I: Lecture and Laboratory
☐	👍 BIO 1143 and BIO 1141 (or BIO 1144)	BSC 111/L Principles of Biological Science II: Lecture and Laboratory



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MEDICINAL AND PHARMACEUTICAL CHEMISTRY 2+2

(Page 2/2)



*** MUST**

Take General Chemistry I and II, Organic Chemistry I, as well as General Psychology and Principles of Sociology for GEC 05.

**fx CALCULUS
READINESS**

Pass MAT 1313 (College Algebra, MAT 101 at Southern Miss) or MAT 1323 (Trigonometry), (MAT 103 at Southern Miss) or have a Math ACT subscore ≥ 24 .

👍 SHOULD

Take General Biology I and II, one sophomore level Biology (Microbiology or Human Anatomy & Physiology), and Physics I.

💡 COULD

Elementary Organic Chemistry, a macro or microeconomics course, or one foreign language sequence.

CHECKLIST

COURSES

Updated August 2025

	Courses at Community College	Equivalent Courses at Southern Miss
☐	 BIO 2923 and BIO 2921 (or 2924)	BSC 282/L General Microbiology: Lecture and Laboratory
☐	 BIO 1530 and BIO 1521 (or 1514) Principles of Anatomy and Physiology	BSC 250/L Human Anatomy and Physiology
☐	 PHY 2413 and PHY 2411 (or PHY 2414) Algebra & Trigonometry	PHY 111/L General Physics I: Lecture and Laboratory
☐	 CHE 2414 and CHE 2411 Introductory Organic Chemistry	CHE 251/L Elemental Organic Chemistry: Lecture and Laboratory
☐	 ECO 2113 or 2123	ECO 201 or ECO 202 Principles of Macroeconomics or Principles of Microeconomics
☐	 World Language 6 hours in a single language	Spanish, German, French regularly offered at USM
☐	 MAT 1313	MAT 101 College Algebra
☐	 MAT 1323	MAT 103 Trigonometry



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MATHEMATICS

MATHEMATICS, MATHEMATICS EDUCATION



PROGRAM INFO

The Bachelor of Science in Mathematics is based on a flexible curriculum so that students may tailor their degree to fit specific educational and career objectives. The BS in Mathematics lays a sound foundation for a broad range of careers in education, industry, business, and government.

CAREER OUTLOOK

Mathematical modeling and logic prepare graduates for diverse fields—from aircraft design and robotics to law, medicine, and public health. There's also a continued demand for skilled mathematics teachers.

Many careers today require education beyond a bachelor's degree. A mathematics major offers strong preparation for advanced study in areas such as math, computer science, statistics, management science, actuarial science, education, engineering, and public health. (A 4+1 accelerated MPH program is available in partnership with the School of Health Professions.)



SCHOLARSHIPS

Mathematics Undergraduate Research Scholarships are provided by the Wright W. and Annie Rea Cross Endowment with a stipend of up to \$2,000 for each year.

There is over \$30,000 in student support available through about 20 scholarships.

RESEARCH AT USM

The Wright W. and Annie Rae Cross Endowment for Undergraduate Research in Mathematics supports students with scholarships, travel funding, equipment, and more. Qualified students complete faculty-mentored research projects, either assigned or self-designed.

Recent topics include data analysis of student success, probability in online gaming revenues, celestial mechanics and special orbits, and Allee Effects in food chain models using mathematical biology.

KNOWLEDGE & SKILLS

Every mathematical topic is alluring as well as the foundation for practical work.

- Calculus provides the foundation for modern science and engineering.
- Probability and Statistics are the pillars that support Data Analysis.
- Numerical Analysis uses state of the art technology and algorithms to analyze complex models.
- Proofs teach us to be highly precise when analyzing a subject.
- Pedagogical skills are applicable every day in the classroom.
- Digital manufacturing applies to and enhances all the skills above.

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MATHEMATICS BS AND **2+2** MATHEMATICS (MATHEMATICS EDUCATION) BS

Complete all requirements for a MS community college associate degree, including general education coursework, and...



- * MUST** Take Calculus I and II.
- 👍 SHOULD** Take additional calculus courses.
Take World Civilizations and General Psychology (math ed. majors).
- 💡 COULD** Take Differential Equations.
Select 1 CSC course (non-education majors).

CHECKLIST

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COURSES

Updated August 2025

Courses at Community College

Equivalent Courses at Southern Miss

* MAT 1613 or MAT 1815	MAT 167 Calculus I
* MAT 1623 or MAT 1825	MAT 168 Calculus II
👍 MAT 2613	MAT 169 Calculus III
👍 MAT 2623	MAT 280 Calculus IV
💡 MAT 2913	MAT 285 Introduction to Differential Equations I
💡 COMPUTER SCIENCE (non-education majors only, select 1) CSC 1213 Visual Basic Computer Programming I CSC 1613 Computer Programming I CSC 2134 Programming I with C++	CSC 101/L Computer Science I
LICENSURE REQUIREMENTS (education majors only, may duplicate general education coursework) 👍 HIS 1113 or HIS 1163 👍 HIS 1123 or HIS 1173 👍 PSY 1513 General Psychology	HIS 101 World Civilizations: Beginnings to 1500 C.E. HIS 102 World Civilizations: 1500 to the Present PSY 110 General Psychology



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PHYSICS

PHYSICS, PHYSICS EDUCATION



PROGRAM INFO

All natural laws are laws of physics, making physics the most fundamental of the natural sciences. By studying how these laws can be applied to produce new insights, physics majors become universal problem solvers. Our program boasts small classes and dedicated faculty.

CAREER OUTLOOK

The physics program prepares students for technical positions in the industrial and governmental sectors or graduate study in physics. We train our students to think critically and solve complex problems, making them ideal candidates for research positions in academic, government, and private sector institutions.

Common career paths include computer hardware & software, engineering, data science, education, and medicine.

RESEARCH AT USM

Current faculty research areas include computer simulations of solid-state and polymer systems, nuclear theory, experimental atomic and molecular physics, optics, and computational ocean acoustics. Each student participates in a research project with faculty as part of the curriculum.

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KNOWLEDGE & SKILLS

Fundamental areas of physics:

- **Mechanics:** The study of forces, particles, and their interactions. The foundation for phenomena such as stability of buildings and jet propulsion.
- **Electrodynamics:** The study of electromagnetic fields. The foundation for wireless communication.
- **Quantum mechanics:** The study of the amazing world at the nanoscale and beyond. The final frontier for computer design and approaches to computing.
- **Relativity:** The study of gravity and particles at high speeds. The new frontier for study of the early universe.

Skills learned by physics students:

- Analytical and problem-solving skills
- Mathematical proficiency
- Critical thinking
- Experimental and laboratory techniques
- Data analysis and modeling
- Computational skills
- Communication
- Research
- Ethical and professional responsibility



SCHOLARSHIPS

There are more than 10 program-specific scholarships awarded annually.

PHYSICS BS AND PHYSICS (PHYSICS EDUCATION) BS

2+2 (Page 1/2)



Complete all requirements for a MS community college associate degree, including general education coursework, and...

-  **MUST** Take Physics I and II with Calculus. Calculus I and II to prepare for theoretical Physics courses.
-  **SHOULD** Take chemistry and additional calculus courses. *Physics education emphasis only:* Take additional lab sciences on page two, World Civilizations, and General Psychology courses.
-  **COULD** *Physics non-education majors only:* Take Differential Equations and computer science.

CHECKLIST

COURSES

Updated August 2025

	Courses at Community College	Equivalent Courses at Southern Miss
☐	 PHY 2513 and PHY 2511 (or PHY 2514)	PHY 201/L General Physics I <u>w/ Calculus</u> Lecture and Lab
☐	 PHY 2523 and PHY 2521 (or PHY 2524)	PHY 202/L General Physics II <u>w/ Calculus</u> Lecture and Lab
☐	 MAT 1613 or MAT 1815	MAT 167 Calculus I
☐	 MAT 1623 or MAT 1825	MAT 168 Calculus II
☐	 MAT 2613	MAT 169 Calculus III
☐	 MAT 2623	MAT 280 Calculus IV
☐	 CHE 1213 and CHE 1211 (or CHE 1214)	CHE 106/L General Chemistry I Lecture and Laboratory
☐	 CHE 1223 and CHE 1221 (or CHE 1224)	CHE 107/L General Chemistry II Lecture and Laboratory



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PHYSICS BS AND PHYSICS (PHYSICS EDUCATION) BS

2+2 (Page 2/2)

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Complete all requirements for a MS community college associate degree, including general education coursework, and...



*** MUST**

Take Physics I and II with Calculus. Calculus I and II to prepare for theoretical Physics courses.

👍 SHOULD

Take chemistry and additional calculus courses. *Physics education emphasis only:* Take additional lab sciences below, World Civilizations, and General Psychology courses.

💡 COULD

Physics non-education majors only: Take Differential Equations and computer science.

CHECKLIST

COURSES

Updated August 2025

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Courses at Community College

Equivalent Courses at Southern Miss

PHYSICS EDUCATION

(education emphasis only)



BIO 1133 and BIO 1131
(or **BIO 1134**)



BIO 1143 and BIO 1141
(or **BIO 1144**)



PHY 1113 and PHY 1111
(or **PHY 1114**)



GLY 1113 and GLY 1111
(or **GLY 1114**)



HIS 1113 or HIS 1163



HIS 1123 or HIS 1173



PSY 1513
General Psychology

BSC 110/L

Principles of Biological Science I Lecture and Lab

BSC 111/L

Principles of Biological Science II Lecture and Lab

AST 111/L

General Astronomy I Lecture and Laboratory

GLY 101/L

Physical Geology Lecture and Laboratory

HIS 101

Western Civilizations: Beginnings to 1500 C.E.

HIS 102

Western Civilizations: 1500 to the Present

PSY 110

General Psychology

PHYSICS BS

(non-education only)



MAT 2913
Differential Equations



COMPUTER SCIENCE (Select 1)

CSC 1213
Visual Basic Computer Programming I

CSC 1613
Computer Programming I

CSC 2134
Programming I with C++

MAT 285

Introduction to Differential Equations I

CSC 101/L

Computer Science I Laboratory



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