

BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN MECHANICAL ENGINEERING

Program Learning Outcomes for the BA Degree with a Major in Mechanical Engineering

Upon completing the BA degree with a major in Mechanical Engineering, students will be able to demonstrate:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
6. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Requirements for the BA Degree with a Major in Mechanical Engineering

For general university requirements, see [Graduation Requirements \(https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/\)](https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BA degree with a major in Mechanical Engineering must complete:

- A minimum of 23 courses (64 credit hours) to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 9 courses (28 credit hours) taken at the 300-level or above.

The BA degree with a major in Mechanical Engineering is highly flexible, involves less technical content than the BSME degree, and allows students greater freedom to pursue areas of interest outside of engineering. The BA degree with a major in Mechanical Engineering is not accredited by the Engineering Accreditation Commission of ABET.

Lists of courses, including general university requirements and the usual order in which students take them, are available from the department. The BA degree with a major in Mechanical Engineering mirrors the BSME degree in the freshman and sophomore years, with the exception that the laboratory courses are not required. Specific major requirements are completed in the junior and senior years.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted

upon approval of the major's academic advisor, or where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's [Official Certifier \(https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/\)](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Mechanical Engineering		64
Total Credit Hours Required for the BA Degree with a Major in Mechanical Engineering		120

Degree Requirements

Code	Title	Credit Hours
Basic Math and Science Courses (Prerequisites)		
CHEM 121 or CHEM 111	GENERAL CHEMISTRY I AP/OTH CREDIT IN GENERAL CHEMISTRY I	3
CHEM 123 or CHEM 113	GENERAL CHEMISTRY LABORATORY I AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I	1
MATH 101 or MATH 105	SINGLE VARIABLE CALCULUS I AP/OTH CREDIT IN CALCULUS I	3
MATH 102 or MATH 106	SINGLE VARIABLE CALCULUS II AP/OTH CREDIT IN CALCULUS II	3
MATH 211	ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA	3
MATH 212	MULTIVARIABLE CALCULUS	3
PHYS 101 & PHYS 103	MECHANICS (WITH LAB) and MECHANICS DISCUSSION ¹	4
PHYS 102 & PHYS 104	ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION ²	4

Required Courses for Mechanical Engineering ³

Computational Applied Mathematics and Operations Research Courses		
CMOR 220 or MECH 210	INTRODUCTION TO ENGINEERING COMPUTATION INTRODUCTION TO NUMERICAL METHODS	3
CMOR 302 or MATH 355 or MATH 354	MATRIX ANALYSIS LINEAR ALGEBRA HONORS LINEAR ALGEBRA	3
CMOR 304	DIFFERENTIAL EQUATIONS IN SCIENCE AND ENGINEERING	3
Mechanical Engineering Courses		
MECH 200	CLASSICAL THERMODYNAMICS	3
MECH 202	MECHANICS/STATICS	3
MECH 203	MECHANICAL ENGINEERING DESIGN TOOLS	3
MECH 310	RIGID BODY DYNAMICS	3
MECH 315	STRESS ANALYSIS	3
MECH 343	MODELING OF DYNAMIC SYSTEMS - LECTURE & LAB	4
MECH 350	MECHANICAL ELEMENTS	3

MECH 371	FLUID MECHANICS I	3
MECH 420 / ELEC 436	FUNDAMENTALS OF CONTROL SYSTEMS	3
MECH 481	HEAT TRANSFER	3
Total Credit Hours Required for the Major in Mechanical Engineering		64
Additional Credit Hours to Complete Degree Requirements *		25
University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/) *		31
Total Credit Hours		120

Footnotes and Additional Information

* **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

¹ The Mechanical Engineering department has determined that credit awarded for PHYS 141 *CONCEPTS IN PHYSICS I* is not eligible for meeting the requirements of the Mechanical Engineering major.

² The Mechanical Engineering department has determined that credit awarded for PHYS 142 *CONCEPTS IN PHYSICS II* is not eligible for meeting the requirements of the Mechanical Engineering major.

³ Note that the courses required to complete the major must be taken after the 10 required **Basic Math and Science (Prerequisite) courses** (24 credit hours).

Policies for the BA Degree with a Major in Mechanical Engineering

Program Restrictions and Exclusions

Students pursuing the BA Degree with a Major in Mechanical Engineering should be aware of the following program restriction:

- As noted in Majors, Minors, and Certificates (<https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/>), under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the BA Degree with a Major in Mechanical Engineering may not additionally pursue the Bachelor of Science Degree in Mechanical Engineering (BSME) Degree.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (<https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/>). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university's official list of transfer credit advisors (<https://oaa.rice.edu/advising-network/transfer-credit-advisors/>) on their website: <https://oaa.rice.edu>. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the major in Mechanical Engineering should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

Additional Information

For additional information, please see the Mechanical Engineering website: <https://mech.rice.edu/>

Opportunities for the BA Degree with a Major in Mechanical Engineering

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (<https://ga.rice.edu/undergraduate-students/honors-distinctions/university/>) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (<https://ga.rice.edu/undergraduate-students/honors-distinctions/university/>). Some departments have department-specific Honors awards or designations.

Fifth-Year Master's Degree Option for Rice Undergraduate Students

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this *Undergraduate - Graduate Concurrent Enrollment* opportunity, including specific information on the registration process can be found here (<https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/>).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Mechanical Engineering (MME) degree. For additional information, students should contact their undergraduate major advisor and the MME program director.

Additional Information

For additional information, please see the Mechanical Engineering website: <https://mech.rice.edu/>