

Course 2

GAMEDGetting Around the
Mechanical Engineering Department



GAMED

GETTING AROUND THE MECHANICAL ENGINEERING DEPARTMENT

Academic Year 2019-2020

A guide to your undergraduate education at MIT's
Department of Mechanical Engineering.

*Keep this guide to the ME Undergraduate Program throughout your education.
It has content useful to sophomores, juniors and seniors alike.*

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MechE Undergraduate Office

The mission of the MechE Undergraduate Office is to support the department's undergraduate programs and to help serve the academic needs of MechE undergraduate students. At our office you can get information, forms, and advice. The UG office is staffed by:

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Mechanical Engineering Undergraduate Office

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Bachelor of Science in Mechanical Engineering/Course 2

The program in mechanical engineering provides a broad intellectual foundation in the field of mechanical engineering. The program develops the relevant engineering fundamentals, includes various experiences in their application, and introduces the important methods and techniques of engineering practice.

This program has been accredited by the Accreditation Commission of ABET, <http://www.abet.org>, as a mechanical engineering degree.

Requirements

Bachelor of Science in Mechanical Engineering/Course 2

General Institute Requirements (GIRs)	Subjects
Science Requirement (Calculus I & II, Physics I & II, Chemistry, Biology)	6
Humanities, Arts, and Social Sciences Requirement	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 2.001 and 18.03 in the Departmental Program]	2
Laboratory Requirement [can be satisfied by 2.671 in the Departmental Program]	1
Total GIR Subjects Required for SB Degree	17

Communication Requirement

The program includes a Communication Requirement of 4 subjects: 2 subjects designated as Communication Intensive in Humanities, Arts, and Social Sciences (CI-H); and 2 subjects designated as Communication Intensive in the Major (CI-M) [satisfied by 2.009 and 2.671 in the Departmental Program].

PLUS Departmental Program

Subject names are followed by units, and prerequisites if any (corequisites in italics).

Required Departmental Core Subjects	Units
2.001 Mechanics and Materials I, 12, REST; Calculus II, Physics I, <i>18.03</i>	153
2.002 Mechanics and Materials II, 12; Chemistry, 2.001	
2.003J Dynamics and Control I, 12, REST; Physics I, <i>18.03*</i>	
2.004 Dynamics and Control II, 12; Physics II, 2.003J	
2.005 Thermal-Fluids Engineering I, 12; Calculus II, Physics II, 2.086*	
2.006 Thermal-Fluids Engineering II, 12; 2.005	
2.008 Design and Manufacturing II, 12, 1/2 LAB; 2.005; 2.007 or 2.017J	
2.009 The Product Engineering Process, 12, CI-M; 2.001, 2.003J, 2.005; 2.670, 2.00B or 2.678; senior standing or permission of instructor*	

- 2.086 Numerical Computation for Mechanical Engineers, 12, REST; Calculus II, Physics I, 18.03*
- 2.670 Mechanical Engineering Tools, 3 ⁽²⁾
- 2.671 Measurement and Instrumentation, 12, LAB, CI-M; Physics II, 2.001, 2.003J, 2.086*
- 18.03 Differential Equations, 12, REST; *Calculus II**
- 2.ThU Undergraduate Thesis, 6⁽¹⁾
- and*
- 2.007 Design and Manufacturing I, 12; 2.001, 2.670, 2.086
- or*
- 2.017J Design of Electromechanical Robotic Systems, 12, 1/2 LAB; 2.003J; 2.005 or 2.016; 2.671

Restricted Elective Subjects

24

Students are required to take two of the following elective subjects (substitutions may be requested by petition to the ME Undergraduate Office, 1-110):

- 2.016 Hydrodynamics, 12; 2.005
- 2.017J Design of Electromechanical Robotic Systems, 12, 1/2 LAB; 2.003J, 2.016, 2.678; 2.671
- 2.019 Design of Ocean Systems, 12, CI-M; 2.003J, 2.016 and 2.678; 2.671
- 2.050J Nonlinear Dynamics I: Chaos, 12; Physics II; 18.03 or 18.04
- 2.092 Computer Methods in Dynamics, 12; 2.001, 2.003J
- 2.12 Introduction to Robotics, 12; 2.004
- 2.14 Analysis and Design of Feedback Control Systems, 12; 2.004
- 2.184 Biomechanics and Neural Control of Movement, 12; 2.004 or permission of instructor
- 2.370 Fundamentals of Nanoengineering, 12; Chemistry, 2.001
- 2.51 Intermediate Heat and Mass Transfer, 12; 2.006*
- 2.60J Fundamentals of Advanced Energy Conversion, 12; 2.006*
- 2.650 Introduction to Sustainable Energy, 12;
- 2.676 Micro/Nano Engineering Lab, 12; 2.001, 2.003, 2.671; 2.005, or 2.051 & 2.06
- 2.71 Optics, 12; Physics II, 18.03, 2.004*
- 2.72 Elements of Mechanical Design, 12; 2.005, 2.008, 2.671
- 2.744 Product Design, 12; 2.009
- 2.782[J] Molecular, Cellular, and Tissue Biomechanics, 12; 2.370, 18.03
- 2.797J Molecular, Cellular, and Tissue Biomechanics, 12; 18.03 or 3.016; 7.012, 7.013, 7.014, or 7.105; 2.370 or 2.772J
- 2.813 Environmentally Benign Design and Manufacturing, 12; 2.008 or permission of instructor
- 2.853 Introduction to Manufacturing Systems, 12; 2.008
- 2.96 Management in Engineering, 12

See **Allowed Substitutions** for more options (by petition).

Departmental Program Units That Also Satisfy the GIRs

(36)

Unrestricted Electives

48

Notes

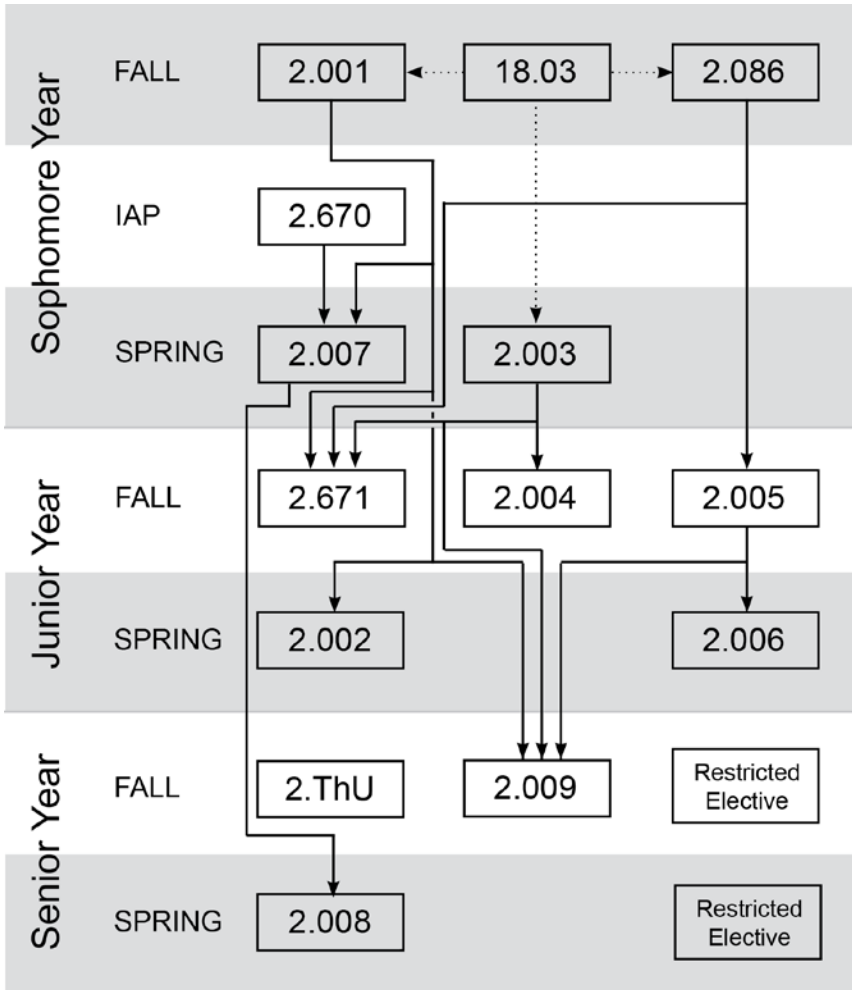
*Alternate prerequisites are listed in the subject description.

(1) For thesis substitutions, please refer to <https://meundergrad.mit.edu/substitutions>

(2) 2.670 is offered during the fall & spring semesters, in addition to IAP.

Typical Course 2 Flow Chart

HASS subjects and the four unrestricted electives are not shown.



Scheduling Comments

- 2.001** Fundamental M.E. subject which should be taken as early as possible (often taken in the second semester of the first year).
- 2.002** Should be taken following 2.001.
- 2.003** Fundamental M.E. subject which should be taken as early as possible.
- 2.004*** Should be taken the semester following 2.003J.
- 2.005** Should be taken first semester junior year.
- 2.006** Should be taken the semester following 2.005.
- 2.007*** Important to take this second semester sophomore year, immediately following 2.670. Students may alternatively take 2.017J*.
- 2.008*** Should be taken in the junior or senior year.
- 2.009** Must be taken first semester of the senior year (fulfills half of CI-M requirement). Students may alternatively take 2.013*, 2.014*, 2.019* 2.750* or 2.760*.
- 2.086** Should be taken Sophomore year.
- 2.670** Must be taken before 2.007.
- 2.671*** Fulfills half of the CI-M requirement.

* Laboratory subject in which enrollment may be limited by facilities available.

Sample Schedules for Course 2

Typical Mainstream Schedule

First Year	Fall		IAP		Spring	
	3.091	12			8.02	12
	8.01	12			18.02	12
	18.01	12			Elective	12
	HASS	12			HASS	12
Total Units	48				48	

Sophomore	Fall		IAP		Spring	
	2.001	12	2.670	3	2.003J	12
	2.086	12			2.007	12
	18.03	12			7.013/4	12
	HASS	12			HASS	12
Total Units	48		3		48	

Junior	Fall		IAP		Spring	
	2.004	12			2.002	12
	2.005	12			2.006	12
	2.671	12			Elective	12
	HASS	12			HASS	12
Total Units	48				48	

Senior	Fall		IAP		Spring	
	2.009	12	2.ThU	3-6	2.008	12
	Restricted Elective	12			Restricted Elective	12
	Elective	12			Elective	12
	HASS	12			HASS	12
					2.ThU	3-6
Total Units	48		3-6		51-54	

Late Entry Schedule for Course 2

First Year	Fall		IAP		Spring	
	3.091	12			8.02	12
	8.01	12			18.02	12
	18.01	12			Elective	12
	HASS	12			HASS	12
Total Units	48				48	

Sophomore	Fall		IAP		Spring	
	18.03	12			2.001	12
	7.012	12			Elective	12
	Elective	12			Elective	12
	HASS	12			HASS	12
Total Units	48				48	

Junior	Fall		IAP		Spring	
	2.003J	12	2.670	3	2.004	12
	2.005	12			2.006	12
	2.086	12			2.007	12
	HASS	12			HASS	12
Total Units	48		3		48	

Senior	Fall		IAP		Spring	
	2.009	12	2.ThU	3-6	2.002	12
	2.671	12			2.008	12
	Restricted Elective	12			2.ThU	3-6
	HASS	12			Restricted Elective	12
					HASS	12
Total Units	48		3-6		51-54	

Bachelor of Science in Engineering as Recommended by the Department of Mechanical Engineering/Course 2-A

Course 2-A is designed for students whose academic and career goals demand greater breadth and flexibility than are allowed under the mechanical engineering program, Course 2. To a large extent, the 2-A program allows students an opportunity to tailor a curriculum to their own needs, starting from a solid mechanical engineering base. The program combines a rigorous grounding in core mechanical engineering subjects with an individualized course of study focused on a second area that the student designs with the help and approval of the 2-A faculty advisor. The program leads to the degree Bachelor of Science in Engineering as recommended by the Department of Mechanical Engineering.

This program has been accredited by the Accreditation Commission of ABET, <http://www.abet.org>, as an engineering degree.

A significant part of the 2-A curriculum consists of electives chosen by the student to provide in-depth study of a field of the student's choosing. A wide variety of popular concentrations are possible, in which well-selected academic subjects complement a foundation in mechanical engineering and general Institute requirements.

The self-designed concentration must form an engineering topic and include at least 72 units. Coursework for this degree program **requires approval** from the MechE Undergraduate Office. The online form for the proposed coursework must be submitted by the start of the term following a student's enrollment in Course 2-A. Approval of this form guarantees that the Course 2-A degree requirements will be fulfilled if the proposed coursework is completed. Changes to the coursework can be made by re-submission of the form and its re-approval.

Online Enrollment form: <https://meche-res.mit.edu/resources/new2A/>

2-A Concentrations

Many different concentrations are possible, and a student's particular program may be unique. To aid students in choosing their concentrations, the faculty have developed specific program recommendations in the following areas.

- Biomechanics and Biomedical Devices
- Computation
- Control, Instrumentation and Robotics
- Energy
- Engineering Management
- Entrepreneurship
- Environmental Mechanics
- Industrial Design
- Machine Learning & Physical Systems
- Manufacturing
- Mechanics
- Nano/Micro Engineering
- Product Development
- Sustainable and Global Development

For more information, see track descriptions on the 2-A website: <https://meundergrad.mit.edu/2-degree/choosing-2-concentration>

Concentrations are not limited to those listed above. Students are encouraged to design and propose technically oriented concentrations that reflect their own needs and those of society.

Resources for 2-A concentration planning:

2-A Website: <https://meundergrad.mit.edu/2A-degree>

Choosing a concentration: <https://meundergrad.mit.edu/2A-degree/choosing-2A-concentration>

2-A Enrollment Form: <https://meche-res.mit.edu/resources/new2A/>

Engineering Units: <https://meundergrad.mit.edu/2A-degree/engineering-units-concentration-requirements>

Double Majors with Course 2-A

To apply for a double major, students submit a petition to the Committee on Curricula after completing at least three terms at MIT, including at least one in the department of one of the majors.

For more information:

http://web.mit.edu/registrar/subjects/cmtes/coc/petitions_doublemajor.html

In the case of Course 2-A, no more than 24 units counted in fulfillment for another major may be used to fulfill the 72-unit concentration requirement of Course 2-A. Other subjects may overlap (for example, 2.005 and 18.03 are

required for both the Course 2-A and Course 22, and each would count toward both majors

Choosing a Concentration

<https://meundergrad.mit.edu/2A-degree/choosing-2A-concentration>

A concentration is 6-8 subjects (72 units or more) that form a topic within the field of engineering. Your concentration should make up a **single cohesive topic** (not a group of topics), and the relationship between your topic and subjects should be logical and obvious. Your topic should be simple enough that you can describe it easily in a short paragraph (as part of your 2-A enrollment form: <https://meche-res.mit.edu/resources/new2A/>). Most of the concentration should be advanced subjects (except for one REST or introductory subject).

If you aren't sure what you'd like to do for your concentration, it can be helpful to look at the Tracks section of the 2-A website. Your concentration does not have to be in one of the listed tracks; the tracks are simply concentrations that are popular enough to have a description. If you choose one of these tracks, you are not limited to taking the specific subjects that are listed in the description.

Once you have a concentration, then you just need to select subjects (72 units or more) that fit within your selected topic, from any department. Guidelines for the 2A degree can be found on the main Tracks webpage. After you submit your form, the engineering content will be assessed by the 2A Coordinator. If a subject that you have selected is not an engineering subject, then the "engineering units" associated with the subject may be zero, or a portion of the total number of units (see link below for more on engineering units). In this case, you may need to include extra engineering subjects in order to make sure that you have the required number of engineering units. For example, if your concentration includes 60 units of engineering subjects and 12 units of a science subject, you will need to take 12 units of engineering (which can come from your unrestricted electives). Engineering Units: <https://meundergrad.mit.edu/2-degree/engineering-units-concentration-requirements>

If you have any questions, you can email the 2-A Coordinator, Prof. Seth Lloyd, sllloyd@mit.edu. You are also welcome to talk to Jared Embelton in 1-110, jarede@mit.edu. If you already know what subjects you are going to take for your concentration, then you can simply submit the online form for review.

Requirements

Bachelor of Science in Engineering as recommended by the Department of Mechanical Engineering/Course 2-A

General Institute Requirements (GIRs)	Subjects
Science Requirement (Calculus I & II, Physics I & II, Chemistry, Biology)	6
Humanities, Arts, and Social Sciences Requirement	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 2.001 & 18.03]	2
Laboratory Requirement [satisfied by 2.671 in the Departmental Program]	1
Total GIR Subjects Required for SB Degree	17

Communication Requirement

2 subjects designated as Communication Intensive in Humanities, Arts, and Social Sciences (CI-H); and 2 subjects designated as Communication Intensive in the Major (CI-M) [satisfied by 2.009 and 2.671 in the Departmental Program].

PLUS Departmental Program

Units

Subject names are followed by units, and prerequisites if any (corequisites in italics).

Required Departmental Core Subjects 96

2.00	Introduction to Design, 6 ⁽¹⁾ ; <i>meets second half of the term, Fall</i>
2.001	Elements of Structures, 6; Calculus II, Physics I, 18.03 ⁽³⁾
2.003J	Dynamics and Control I, 12, REST; Physics I, 18.03*
2.005	Thermal Fluids Engineering I, 12; 18.02, 8.02, 2.086
2.086	Numerical Computation for Mechanical Engineers, 12, REST; Calculus II, Physics I, 18.03 ⁽³⁾
2.009	The Product Engineering Process, 12, CI-M; 2.001, 2.003, 2.051; 2.670, 2.678 or 2.00B; senior standing or permission of instructor*
2.671	Measurement and Instrumentation, 12, LAB, CI-M; Physics II, 2.001, 2.003, 2.086*
2.678	Electronics for Mechanical Systems, 6; Physics II
or	
2.674	Micro/Nano Engineering Laboratory, 6; Physics II
18.03	Differential Equations, 12, REST; 18.02

Elective Subjects with Engineering Content 72

Departmental Program Units That Also Satisfy the GIRs (36)

Unrestricted Electives 48

Total Units Beyond the GIRs Required for SB Degree 180

No subject can be counted both as part of the 17-subject GIRs and as part of the 180 units required beyond the GIRs. Every subject in the student's departmental program will count toward one or the other, but not both.

Notes

* Alternate prerequisites are listed in the subject description.

(1) 2.00A, 2.00B + 2.00C are alternatives to 2.00 and will fulfill this requirement. (No petition needed.)

Allowed substitutions: <https://meundergrad.mit.edu/2A-degree/engineering-units-concentration-requirements>

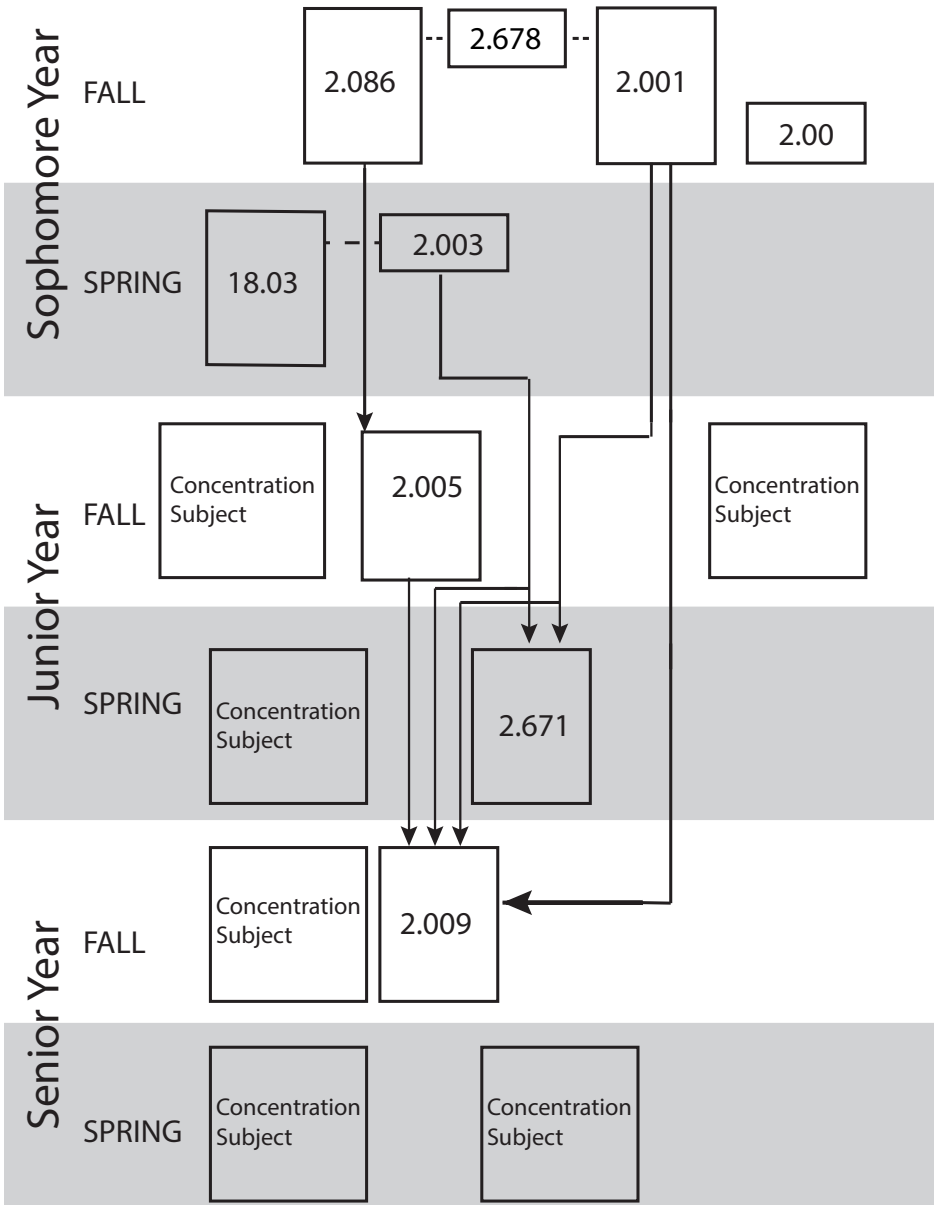
Scheduling Comments

- 2.00*** Should be taken first year or sophomore year. 2.00B may substitute. Fall, second half of term.
- 2.001** Should be taken Fall sophomore year or Spring first year.
- 2.003** Should be taken sophomore year.
- 2.009** Must be taken Fall semester senior year (fulfills half of CI-M requirement). Students may alternatively take 2.013*, 2.750* or 2.760*.
- 2.086** Should be taken sophomore year.
- 2.671*** Must be taken junior year (fulfills half of CI-M requirement).
- 2.678*** Should be taken sophomore year. Full term subject. Students may alternatively take 2.674*.

* Laboratory subject in which enrollment may be limited by facilities available.

Typical Course 2-A Flow Chart

HASS subjects and the four unrestricted electives are not shown.



Sample Schedules for Course 2-A

Typical Mainstream Schedule

First Year	Fall		Spring	
	3.091	12	8.02	12
	8.01	12	18.02	12
	18.01	12	Elective	12
	HASS	12	HASS	12
Total Units		48	48	

Sophomore	Fall			Spring		
	1 st half	2 nd half		1 st half	2 nd half	
		2.00	6	2.003		12
	2.678		6	18.03		12
	2.001		12	Concentration Subject		12
	2.086		12	HASS		12
	HASS		12			
	Total Units			48	48	

Junior	Fall			Spring		
	1 st half	2 nd half		1 st half	2 nd half	
	2.005		12	2.671		12
	Elective		12	Concentration Subject		12
	Concentration subject		12	7.013		12
	HASS		12	HASS		12
	Total Units			48	48	

Senior	Fall		Spring	
	2.009	12	Concentration Subject	12
	Concentration subject	12	Concentration Subject	12
	Elective	12	Elective	12
	HASS	12	HASS	12
Total Units		48	48	

Late Entry Schedule for Course 2-A

First Year	Fall		Spring	
	3.091	12	8.02	12
	8.01	12	18.02	12
	18.01	12	Elective	12
	HASS	12	HASS	12
Total Units	48		48	

Sophomore	Fall		Spring	
	7.012	12	18.03	12
	Elective	12	2.001	12
	Elective	12	2.086	12
	HASS	12	HASS	12
Total Units	48		48	

Junior	Fall			Spring		
	1 st half	2 nd half		1 st half	2 nd half	
	2.003		12	2.671		12
	2.678	2.00	12	Elective		12
	2.005		12	Concentration Subject		12
	HASS		12	HASS		12
			48			48

Senior	Fall			Spring		
	1 st half	2 nd half				
	2.009		12	Concentration Subject		12
	Concentration Subject		12	Concentration Subject		12
	Concentration Subject		12	Concentration Subject		12
	HASS		12	HASS		12
			48	48		

Bachelor of Science in Mechanical and Ocean Engineering/Course 2-OE

This program is intended for students who are interested in combining a firm foundation in mechanical engineering with a specialization in ocean engineering. The program includes engineering aspects of the ocean sciences, ocean exploration and utilization of the oceans for transportation, defense, and extracting resources. Theory, experiment and computation of ocean systems and flows are covered in a number of subjects, complementing a rigorous mechanical engineering program; a hands-on capstone design class allows the student to master the design of advanced marine systems, including autonomous underwater vehicles and smart sensors.

The Mechanical and Ocean Engineering Program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Requirements

Bachelor of Science in Mechanical and Ocean Engineering/Course 2-OE

General Institute Requirements (GIRs)	Subjects
Science Requirement (Calculus I & II, Physics I & II, Chemistry, Biology)	6
Humanities, Arts, and Social Sciences Requirement	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 2.001 and 18.03 in the Departmental Program]	2
Laboratory Requirement [can be satisfied by 2.671 in the Departmental Program]	1
Total GIR Subjects Required for SB Degree	17

Communication Requirement

The program includes a Communication Requirement of 4 subjects: 2 subjects designated as Communication Intensive in Humanities, Arts, and Social Sciences (CI-H); and 2 subjects designated as Communication Intensive in the Major (CI-M) [satisfied by 2.019 and 2.671 in the Departmental Program].

PLUS Departmental Program

Subject names below are followed by credit units, and by prerequisites if any (corequisites in italics).

Units

Required Departmental Subjects**159**

- 2.00A Fundamentals of Eng. Design,9; Calculus I, Physics I,
2.001 Mechanics and Materials I, 12, REST; Calculus II, Physics I, 18.03*⁽¹⁾
2.002 Mechanics and Materials II, 12; Chemistry, 2.001
2.003J Dynamics and Control I, 12, REST; Physics I, 18.03*⁽¹⁾
2.004 Dynamics and Control II, 12; Physics II, 2.003J*
2.005 Thermal-Fluids Engineering I, 12, REST; Calculus II, Physics II, 2.086⁽¹⁾
2.016 Hydrodynamics, 12; 2.005
2.017J Design of Electromechanical Robotic Systems, 12, 1/2 LAB; 2.003J;
2.005 or 2.016; 2.671
2.065 Acoustics and Sensing, 12; 2.003J, 6.003, 8.03, or 16.03
2.086 Numerical Computation for Mechanical Engineers, 12, REST; Calculus II,
Physics I, 18.03*⁽¹⁾
2.612 Marine Power and Propulsion, 12; 2.005
2.677 Design and Experimentation for Ocean Engineering, 6; 2.00A, 2.086; 2.016
2.671 Measurement and Instrumentation, 12, LAB, CI-M; Physics II, 2.001, 2.003J,
2.086*
18.03 Differential Equations, 12, REST; *Calculus II*⁽¹⁾

Restricted Elective Subjects**12**

Students are required to take one of the following elective subjects

- 2.006 Thermal Fluids Engineering II, 12; 2.005, 18.03
2.008 Design and Manufacturing II, 12, 1/2 LAB; 2.001; 2.005;
2.007 or 2.017J
2.013 Engineering Systems Design, 12; 2.001, 2.033, 2.005
2.014 Engineering Systems Development, 12; 2.001, 2.003, 2.005
2.019 Design of Ocean Systems, 12, CI-M; 2.001; 2.003J; 2.005 or 2.016; senior
standing or permission of instructor
2.092 Computer Methods in Dynamics, 12; 2.001, 2.003J
2.12 Introduction to Robotics, 12; 2.004
2.14 Analysis and Design of Feedback Control Systems, 12; 2.004
2.700 Principles of Naval Architecture, 12; 2.002 or 2.012J
2.96 Management in Engineering, 12
2.ThU Undergraduate Thesis, 12

Departmental Program Units That Also Satisfy the GIRs**(36)****Unrestricted Electives****48****Total Units Beyond the GIRs Required for SB Degree****183**

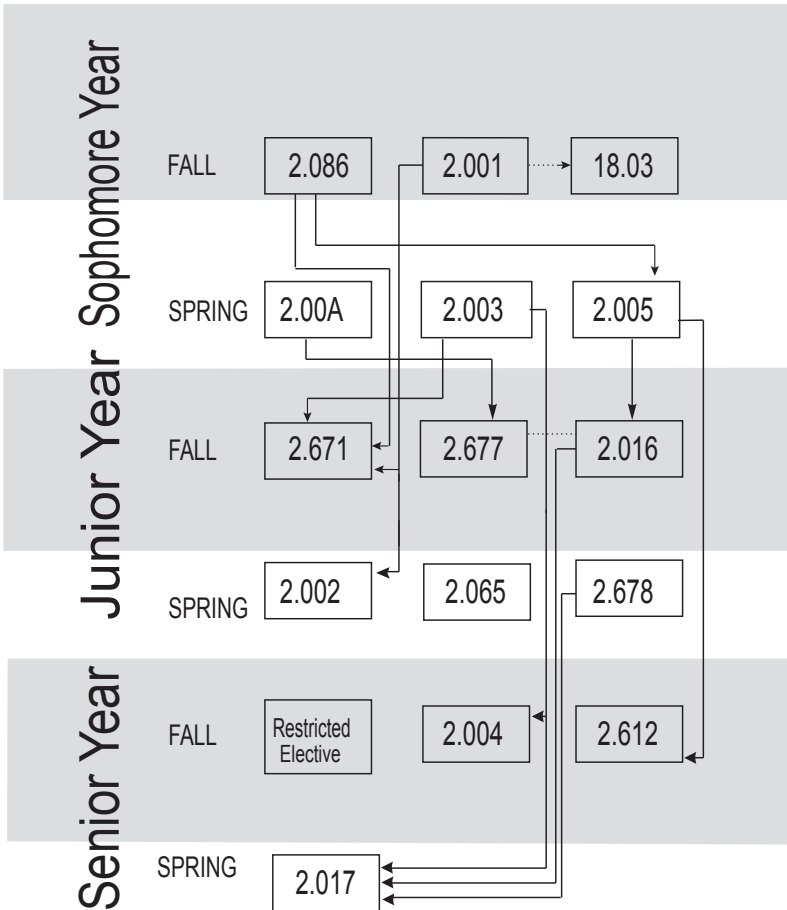
No subject can be counted both as part of the 17-subject GIRs and as part of the 183 units required beyond the GIRs. Every subject in the student's Departmental Program will count toward one or the other, but not both.

Notes

*Alternate prerequisites are listed in the subject description.

Typical Course 2-OE Flow Chart

HASS subjects and the four unrestricted electives are not shown.



Scheduling Comments

2.001	Fundamental M.O.E. subject which should be taken as early as possible.
2.002	Should be taken the semester following 2.001.
2.003	Fundamental M.O.E. subject which should be taken as early as possible.
2.004	Should be taken the semester following 2.003J.
2.005	Should be taken first semester junior year.
2.016*	Should be taken the Fall semester following 2.003J.
2.017*	Senior Capstone course & CI-M requirement.
2.065	Should be taken the Spring semester of junior or senior year.
2.671*	Must be taken junior year (fulfills half of the CI-M requirement).
2.612	Taken in the Fall semester of the senior year.
2.677	Junior-level lab course that should be taken concurrently with 2.016 (6 Units).

* Laboratory subject in which enrollment may be limited by facilities available.

Sample Schedules for Course 2-OE

Typical Mainstream Schedule

First Year	Fall		Spring	
	3.091	12	8.02	12
	8.01	12	18.02	12
	18.01	12	Elective	12
	HASS	12	HASS	12
Total Units		48		48

Sophomore	Fall		Spring	
	2.001	12	2.003J	12
	18.03	12	2.00A	9
	2.086	12	2.005	12
	HASS	12	HASS	12
		2.678	6	
Total Units		48		51

Junior	Fall		Spring	
	2.677	6	2.002	12
	2.016	12	Elective	12
	2.671	12	2.065	12
	HASS	12	HASS	12
	7.013	12		
Total Units		54		48

Senior	Fall		Spring	
	2.004	12	2.017	12
	2.612	12	Elective	12
	Restricted Elective	12	Elective	12
	HASS	12	HASS	12
Total Units		48		48

Late Entry Schedule for Course 2-OE

First Year	Fall		Spring	
	3.091	12	8.02	12
	8.01	12	18.02	12
	18.01	12	Elective	12
	HASS	12	HASS	12
Total Units		48		48

Sophomore	Fall		Spring	
	Elective	12	2.001	12
	7.012	12	18.03	12
	Elective	12	2.00A	9
	HASS	12	HASS	12
Total Units		48		45

Junior	Fall		Spring	
	2.003J	12	2.002	12
	2.016	12	2.005	12
	2.677	6	2.671	12
	2.086	12	HASS	12
	HASS	12		
Total Units		54		48

Senior	Fall		Spring	
	2.004	12	2.017	12
	2.612	12	2.678	6
	2.006	12	2.065	12
	HASS	12	HASS	12
Total Units		48		42

Additional Program Information

Advising

When students enter the Department of Mechanical Engineering, they are assigned a faculty academic advisor. The principal role of the academic advisor is to help individual students plan their academic programs in ways that are consistent with the degree requirements and their career objectives. The faculty academic advisor is only one of many advising resources.

Advising Resources

- **Faculty Academic Advisor** (class selection, career/networking advice, grad school advice, if you are having trouble with academics or have issues affecting academics)
- **UROP supervisors** (research interests, grad school, career/networking advice)
- **Instructors** (class selection for restricted electives/engineering topics, research interests)
- **The Undergraduate Office**, Room 1-110 (degree audits, class selection, navigating bureaucracy, difficulty with coursework, personal or medical issue referrals, or if you don't know where to go)
- **Student Support Services** (personal or medical issues, testing accommodations, general advice and support)

The Department strongly recommends that students reach out to all advising options available, and cultivate an advising network. Students interested in grad school will need 3 letters of recommendation. Students more interested in going into industry may find that faculty have different relationships with industry, and different perspectives regarding career advice, or different networking opportunities.

It is important to speak to your assigned faculty academic advisor regarding all issues pertaining to academic performance, even if they stem from a personal or medical issue. Your faculty academic advisor is your designated advocate to the Committee on Academic Performance, and to the Department, so it is important to keep your advisor updated should you experience difficulty, even if you have reached out to another member of your advising network.

Allowed Substitutions (Course 2, 2-A, 2-OE subjects)

You can always "trade up"!

<u>Degree</u>	<u>Requirement</u>	<u>Allowed substitution</u>
Course 2/2-A	2.009	2.013, 2.014, 2.019, 2.750, or 2.760 with a petition
Course 2-A	2.00	2.00A, 2.00B, 2.00C or 2.007
Course 2/2-OE	Restricted Electives	Advanced 12-unit subjects closely related to mechanical (or ocean) engineering are typically allowed as restricted electives with a petition.
Course 2	2.ThU	2.014, 2.095, SuperUROP. Note: Cannot also counted toward another departmental requirement.

Other substitutions are reviewed on a case-by-case basis; this list represents routine substitutions that have already been reviewed and approved.

Petitions: Room 1-110 or

https://meundergrad.mit.edu/sites/default/files/documents/Petition_to_Substitute_fillable.pdf

Communication Requirement

Engineering work is critically dependent upon communication skills. Engineers must be able to report their ideas and designs clearly and succinctly to their coworkers, supervisors, and customers. The format of engineering communications can vary widely, from complete written reports, to short technical memos, to oral presentations, to visual displays. The MIT Communication Requirement, as implemented in the MechE program, is intended to prepare students to work effectively in all of these formats.

Departmental subjects that involve extensive education in communication include: 2.671, taken in the sophomore or junior year; 2.009, taken in the fall of the senior year; and 2.019, taken in the spring of the senior year. Through this set of classes, students gain experience in technical reporting in written, oral, and visual formats, both as individuals making reports and as members of teams making reports. The MechE faculty regard the development of good communication skills as an essential learning outcome of our programs.

Details of the Communication Requirement follow.

The Sophomore Year

You must complete your second Communication Intensive subject by the end of your sophomore year. You may receive CI credit for only one CI-H subject per semester. Since CI-H subjects may be either part of the HASS Distribution Component (HASS-A/H/S) or HASS Electives, you should carefully consider the most appropriate subject for you. In order to enroll in a CI-H, you must pre-register for it, and use the CI-H lottery tool online, or add yourself to the waitlist and see if there is space in the class. A list of CI-H subjects is online at <http://web.mit.edu/commreq/cih.html>. Instructions for the CI-H lottery system can be found at: <http://enrollmenttools.mit.edu/>

The Junior and Senior Year

You **must** complete one Communication Intensive subject in the major (CI-M) by the end of the junior year and a second one by the end of the senior year. In Course 2 and 2A, the combination 2.671 and 2.009 together satisfy the CI-M component of the Communications Requirement. Generally, 2.671 will be the junior year CI-M and 2.009 will be the senior year CI-M (2.013, 2.019, 2.750 and 2.760 are CI-M subjects that can substitute for 2.009, but not 2.671). In Course 2-OE, the combination 2.671 and 2.017 together satisfy the CI-M requirement, with 2.671 in the junior year and 2.017 in the senior year (no substitutions).

Students who do not fulfill the CI-M requirement cannot graduate from MIT. Further details on CI-M subjects are available at <http://web.mit.edu/commreq/cim.html>.

Double Major Candidates

You must complete two CI-H subjects and the CI-M subjects that fulfill the communication component of each major. Typically, this means that you must take four CI-M subjects, two for each program. However, if a subject is approved as a CI subject in both majors, you may use that subject to fulfill the CI-M component of both programs simultaneously, with the approval of the Subcommittee on the Communication Requirement (SOCR). Contact the Office of the Communication Requirement (35-433; commreq@mit.edu) for more information.

SB Thesis Requirement

Resources for thesis students: <https://meundergrad.mit.edu/sb-thesis-information>

The SB in Mechanical Engineering requires a thesis with a minimum of 6 units credit. The objective of this requirement is to give students an opportunity to learn about a topic in depth through independent study under the guidance of an advisor who is knowledgeable in the field.

Finding a thesis supervisor

Students have the responsibility to find their own thesis supervisor, and it is best that this be done by the beginning of the senior year. ***Students are strongly encouraged to arrange their thesis in the Fall term of Senior year, even if the majority of the work will occur during IAP or Spring term.***

Many students develop theses from UROP projects that they have had during the junior year or summer between junior and senior years. In that case, the UROP supervisor becomes the thesis supervisor. In other cases, students will contact faculty members whose research is of interest to them, and a thesis project can be developed by discussion between the student and the faculty member. In still other cases, students may have their own clear idea of the subject of their thesis, and the task will be to find a faculty member who is interested in working with the student on that topic.

Resources for finding a thesis supervisor:

- Students may continue UROP research as a thesis topic.
- MIT Faculty Cloud (to match research interests):
<http://meche.mit.edu/people>

Thesis registration and grading

Students may elect to start and/or finish the work in the Fall Term, the Spring Term, or IAP, and they may choose to extend the work over several terms. In the latter case, a progress report is required for each term of registration. If the work in progress is judged satisfactory by the advisor, a grade of "J" will be awarded. Unsatisfactory progress will be awarded the grade "U". Students must be registered for subject 2.ThU for the term in which the thesis is submitted.

In addition to registering for thesis, students must complete the [thesis proposal form](http://web.mit.edu/me-ugoffice/thesis.pdf) (<http://web.mit.edu/me-ugoffice/thesis.pdf>) and attach a brief paragraph summarizing the work planned. ***The form must be signed by the thesis advisor and returned to the MechE Undergraduate Office (Room 1-110) no later than Add Date.***

Drop date is the absolute deadline for adding or dropping 2.ThU to a student's registration. Students may not register for thesis after drop date.

Important Notes regarding the thesis and graduation:

It is the responsibility of the student to maintain contact with the thesis advisor. In the event that thesis progress is reported as unsatisfactory, the student's name will be removed from the Degree List. Students are reminded that graduation also can be delayed by late submission of an acceptable thesis or by submission of a thesis that fails to conform to the current Thesis Specifications. Theses may not be submitted to the Undergraduate Office after 5:00 PM on the Thesis Due Date (mid-January for the February degree list, and early May for the June degree list). *Students should plan to submit the thesis to their thesis supervisor 1-2 weeks prior to the thesis due date, in order to get feedback for the final submitted thesis.*

In lieu of a written thesis, students may complete 2.095 or 2.014 with permission from their advisor. A Petition to Substitute form must also be completed and signed by the Undergraduate Officer. For Course 2 SuperUROPs, your SuperUROP project may count for your SB thesis by completing the fall and spring semesters of the required SuperUROP course, 6.UAR as a substitute for 2.THU and having your faculty supervisor approve your final SuperUROP paper.

International Study

Study abroad offers an opportunity for enrichment that goes beyond formal classroom education. Each semester, MIT students enroll in academic programs at foreign institutions for a one-term or full-year program. Students typically study in the period from the second semester of their sophomore year through the first semester of their senior year. With special permission, it is even possible to spend your last term as an undergraduate studying at another university. Plans for study outside MIT should be worked out by each student with his or her faculty advisor and the MIT Study Abroad Office.

MIT has a number of established programs for international study. These include the University of Tokyo Exchange Program, ETH Zurich Exchange Program, the MISTI program, and a number of additional opportunities. Please see web site of the Study Abroad Office for further information on the various programs available: <http://web.mit.edu/studyabroad/>.

For more information contact:
Heather Theberge
MechE Study Abroad Coordinator
htheberg@mit.edu, Room 1-110

Publications and Forms

Academic Dashboard

<https://meche-ad-portal.mit.edu/>

MechE Undergrad Portal

<https://meundergrad.mit.edu>

Class Registration

- Online Registration: <https://registration.mit.edu/>
- Add/drop forms: <http://web.mit.edu/registrar/reg/add-drop.html>
- CI-H lottery information: <http://enrollmenttools.mit.edu/>
- Check your registration at: <http://student.mit.edu>.

Program Related Forms

- Course 2-A Enrollment Form:
<https://meche-res.mit.edu/resources/new2A/>
- Petition to Substitute:
https://meundergrad.mit.edu/sites/default/files/documents/Petition_to_Substitute_fillable.pdf

MechE Optional Email Lists

Students can sign up for any of the following mailing lists by going to the appropriate URL.

- me-ugresearch: UROP and thesis topic emails will go to this list
<http://mailman.mit.edu/mailman/listinfo/me-ugresearch>
- me-ugemployment: recruiter emails, advertisements for internships, grader openings, etc. will go to this list
<http://mailman.mit.edu/mailman/listinfo/me-ugemployment>

Student Organizations

A number of student groups are associated with the MechE Department. These include:

- Pi Tau Sigma, <http://pts.mit.edu/>
- The American Society of Mechanical Engineers,
<http://asme.scripts.mit.edu/home/>
- Tau Beta Pi, <http://web.mit.edu/tbp/www/>
- MIT MESS (Mechanical Engineering Student Society)
https://www.facebook.com/mitmess/?ref=py_c
- MIT FEMME (Female Empowerment Meets Mechanical Engineering)

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