

MASTER OF ENGINEERING MANAGEMENT AND LEADERSHIP (MEML) DEGREE, ONLINE PROGRAM

Program Learning Outcomes for the MEML Degree

Upon completing the MEML degree, students will be able to:

1. *Employ ethical-technical decision making*; understand the susceptibility of engineering teams and organizations to ethical failure and devise creative technical solutions that are constrained by ethics-based boundaries.
2. *Lead and manage engineering teams*; excel at hybrid communications (i.e. to both technical and non-technical persons), managing projects, leading engineering teams, and inspiring people.
3. *Evaluate the economic viability of technology products and ideas*; apply key principles of engineering entrepreneurship to determine if a technical product or idea is valuable and economically viable.
4. *Solve advanced engineering problems*; have a graduate-level understanding of key disciplinary engineering courses. Engineering leaders will lead teams of engineers in a way that leverages the varying degrees of engineering training, from the undergraduate to graduate level. They should have a fundamental understanding and appreciation for the deeper technical skills that graduate-level engineers add to a team.

Requirements for the MEML Degree, Online Program

The MEML degree is a non-thesis master's degree. For general university requirements, please see [Non-Thesis Master's Degrees \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see [All Graduate Students \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/). Students pursuing the MEML degree must complete:

- A minimum of 10 courses (30-32 credit hours, depending on course selection) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (graduate semester credit hours, coursework at the 500-level or above).
- A minimum of 24 graduate semester credit hours must be taken at Rice University.
- A minimum of 24 graduate semester credit hours must be taken in standard or traditional courses (with a course type of lecture, seminar, laboratory, lecture/laboratory).
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- A maximum of 2 courses (6 graduate semester credit hours) from transfer credit. For additional program guidelines regarding transfer credit, see the [Policies](#) (p. 3) tab.

- The requirements for one area of specialization (see below for areas of specialization). The MEML degree program offers twelve areas of specialization:
 - [Bioengineering](#) (p. 2), *or*
 - [Chemical and Biomolecular Engineering](#) (p.), *or*
 - [Civil and Environmental Engineering](#) (p.), *or*
 - [Computational Applied Mathematics and Operations Research](#) (p. 2), *or*
 - [Computer Science](#) (p.), *or*
 - [Data Science](#) (p.), *or*
 - [Electrical and Computer Engineering](#) (p.), *or*
 - [Financial Engineering](#) (p. 3), *or*
 - [Industrial Engineering](#) (p. 3), *or*
 - [Materials Science and Nanoengineering](#) (p.), *or*
 - [Mechanical Engineering](#) (p.), *or*
 - [Statistics](#) (p. 3).
- A minimum of 2 semesters of participation in the Professional Master's Seminar Requirement (RCEL 698 and RCEL 699).³
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 3.00 or higher in all Rice coursework that satisfies requirements for the non-thesis master's degree.

Students in the MEML degree program and in either of the two cohorts (online or on-campus) will be allowed to take up to 3 courses (9 credit hours) in the other modality (on-campus or online) with permission from the Engineering Management and Leadership Program Advisor.

The courses listed below satisfy the requirements for this degree program. In certain instances, courses not on this official list may be substituted upon approval of the program's academic advisor, or where applicable, the department or program's Director of Graduate Studies. Course substitutions must be formally applied and entered into Degree Works by the department or program's [Official Certifier \(https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/\)](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). Additionally, these must be approved by the Office of Graduate and Postdoctoral Studies. 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 MEML Degree		30-32

Degree Requirements

Code	Title	Credit Hours
Core Requirements ¹		
RCEL 501	ENGINEERING MANAGEMENT & LEADERSHIP THEORY AND APPLICATION	3
RCEL 502	ENGINEERING PROJECT MANAGEMENT	3
RCEL 503	ENGINEERING PRODUCT MANAGEMENT IN INDUSTRY 4.0	3
RCEL 504	ETHICAL-TECHNICAL LEADERSHIP	3
RCEL 505	ENGINEERING ECONOMICS FOR ENGINEERING LEADERS	3
RCEL 506 / STAT 550	APPLIED STATISTICS AND DATA SCIENCE FOR ENGINEERING LEADERS	3
Area of Specialization		

Select 1 from the following Areas of Specialization (see Areas of Specialization below): ^{1, 2} 9-11

Bioengineering		
Chemical and Biomolecular Engineering		
Civil and Environmental Engineering		
Computational Applied Mathematics and Operations Research		
Computer Science		
Data Science		
Electrical and Computer Engineering		
Financial Engineering		
Industrial Engineering		
Materials Science and Nanoengineering		
Mechanical Engineering		
Statistics		
Capstone Requirement ¹		
RCEL 507	MASTER'S IN ENGINEERING MANAGEMENT AND LEADERSHIP CAPSTONE	3
Professional Master's Seminar		
RCEL 698	MEML PROFESSIONAL MASTERS SEMINAR SERIES I ³	0
RCEL 699	MEML PROFESSIONAL MASTERS SEMINAR SERIES II ³	0
Total Credit Hours		30-32

Footnotes and Additional Information

¹ Students admitted into either program (online or on-campus) will be allowed to take up to 9 credit hours in the other modality (on-campus or online) with permission from the program advisors.

² Select 3 courses (9-11 credit hours, depending on course selection) from courses offered by the George R. Brown School of Engineering (or from an engineering-centered focus area) as an Area of Specialization to provide technical depth. Courses offered by the George R. Brown School of Engineering include the following: BIOE, CEVE, CHBE, CMOR, COMP, DSCI, ELEC, ENGI, GLHT, INDE, MECH, MSNE, RCEL, SSPB, or STAT. Engineering-centered focus areas (such as Data Science) or student-designed areas of specialization may also be approved. Departmental approval is required for areas of specialization. See below for typically approved areas of specialization.

³ Students must participate in a minimum of 8 RCEL-sponsored or faculty advisor pre-approved enhancement activities over the course of two semesters (RCEL 698 and RCEL 699) to complete the MEML degree. Examples of acceptable activities include the Rice Engineering Leader Panel/Speaker Series, or other School of Engineering department seminars or presentations (with prior approval).

Areas of Specialization

Students must complete a minimum of 3 courses (9-11 credit hours, depending on course selection) from one of the following typically approved Areas of Specialization or from a student-designed Area of Specialization. Department approval is required for areas of specialization.

Please Note the Following:

- The area of specialization courses shown below are examples of paths to completion for the MEML Degree. MEML degree program guidelines allow area of specialization courses which are at the engineering graduate level, i.e., 500-level or greater. MEML students should work with their Program Advisor to identify and clearly document their Area of Specialization courses. Where applicable, the Program Advisor and Official Certifier can submit course substitutions to individualize student MEML degree plans.
- Students admitted into the MEML degree program and in either of the two cohorts (online or on-campus) will be allowed to take up to 3 courses (9 credit hours) in the other modality (on-campus or online) with permission from the Engineering Management and Leadership Program Advisor. Certain restrictions apply for international students:
 - Online MEML students that are international students living outside of the U.S. may not take on-campus (and in-person) courses.
 - On-campus MEML students that are international students must be sure to meet the full-time semester 9 credit hour minimum for on-campus instruction to meet visa requirements.

Area of Specialization: Bioengineering

Code	Title	Credit Hours
BIOE 508 / SSPB 503	SYNTHETIC BIOLOGY	3
BIOE 536	FRONTIERS IN IMMUNOENGINEERING	3
BIOE 539	APPLIED STATISTICS FOR BIOENGINEERING AND BIOTECHNOLOGY	3
Total Credit Hours		9

Area of Specialization: Chemical and Biomolecular Engineering

Code	Title	Credit Hours
CHBE 501	FLUID MECHANICS AND TRANSPORT PROCESSES	3
CHBE 560 / MSNE 560	COLLOIDAL AND INTERFACIAL PHENOMENA	3
CHBE 590	KINETICS, CATALYSIS, AND REACTION ENGINEERING	3
Total Credit Hours		9

Area of Specialization: Civil and Environmental Engineering

Code	Title	Credit Hours
CEVE 500 / MECH 500	ADVANCED MECHANICS OF MATERIALS	3
CEVE 503 / MECH 520	NONLINEAR FINITE ELEMENT ANALYSIS	3
CEVE 527 / MECH 527	PHYSICS GUIDED MACHINE LEARNING & DATA DRIVEN MODELING FEM	3
Total Credit Hours		9

Area of Specialization: Computational Applied Mathematics and Operations Research

Code	Title	Credit Hours
CMOR 520	COMPUTATIONAL SCIENCE	3
CMOR 522	NUMERICAL ANALYSIS	3

CMOR 530	ITERATIVE METHODS FOR SYSTEMS OF EQUATIONS AND UNCONSTRAINED OPTIMIZATION	3
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Total Credit Hours 9

Area of Specialization: Computer Science

Code	Title	Credit Hours
COMP 614	COMPUTER PROGRAMMING FOR DATA SCIENCE ¹	3
COMP 643	BIG DATA	3
COMP 665	DATA VISUALIZATION	3
Total Credit Hours		9

¹ It is highly recommended that students who are not proficient in Python take RCEL 506 prior to taking COMP 614

Area of Specialization: Data Science

Code	Title	Credit Hours
COMP 614	COMPUTER PROGRAMMING FOR DATA SCIENCE ¹	3
COMP 642	MACHINE LEARNING	3
COMP 680	STATISTICS FOR COMPUTING AND DATA SCIENCE	3
Total Credit Hours		9

Footnotes and Additional Information

¹ It is highly recommended that students who are not proficient in Python take RCEL 506 prior to taking COMP 614.

Area of Specialization: Electrical and Computer Engineering

Code	Title	Credit Hours
ELEC 519	DATA SCIENCE AND DYNAMICAL SYSTEMS	3
ELEC 520 / COMP 520	DISTRIBUTED SYSTEMS	4
ELEC 524 / COMP 524	MOBILE AND WIRELESS NETWORKING	4
Total Credit Hours		11

Area of Specialization: Financial Engineering

Code	Title	Credit Hours
STAT 621	APPLIED TIME SERIES AND FORECASTING	3
STAT 649	QUANTITATIVE FINANCIAL RISK MANAGEMENT	3
STAT 686	MARKET MODELS	3
Total Credit Hours		9

Area of Specialization: Industrial Engineering

Code	Title	Credit Hours
INDE 501	FUNDAMENTALS OF INDUSTRIAL ENGINEERING	3
INDE 545	PRESCRIPTIVE ANALYTICS	3

INDE 571	PROBABILITY AND STATISTICAL INFERENCE	3
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Total Credit Hours 9

Area of Specialization: Materials Science and Nanoengineering

Code	Title	Credit Hours
MSNE 510	SCALING CONCEPTS IN 2D MATERIALS AND POLYMER PHYSICS	3
MSNE 511	MATERIALS CHARACTERIZATION FROM NANO TO MACRO	3
MSNE 513	3D PRINTING AND ADDITIVE MANUFACTURING: THEORY AND APPLICATIONS	3

Total Credit Hours 9

Area of Specialization: Mechanical Engineering

Code	Title	Credit Hours
MECH 505	NUMERICAL METHODS FOR ENGINEERS	3
MECH 517 / CEVE 517	FINITE ELEMENT ANALYSIS	3
MECH 554 / BIOE 554 / CEVE 554	COMPUTATIONAL FLUID MECHANICS	3

Total Credit Hours 9

Area of Specialization: Statistics

Code	Title	Credit Hours
STAT 518	PROBABILITY	3
STAT 519	STATISTICAL INFERENCE	3
STAT 542	SIMULATION	3

Total Credit Hours 9

Policies for the MEML Degree, Online Program

Engineering Management and Leadership Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the Rice Center for Engineering Leadership (RCEL) publishes a graduate program handbook, which can be found here: https://gradhandbooks.rice.edu/2023_24/Master_Engineering_Management_Leadership_Online_Handbook.pdf

Admission

Admission to graduate study in Engineering Management and Leadership is open to qualified students holding a BS or a BA degree in a quantitative field from an accredited institution. The MEML degree governing committee will evaluate the previous academic record and credentials of each applicant individually, and will make all admissions decisions.

The MEML degree program exists as two distinct offerings, with both an on-campus and online option. Students must apply to either the on-campus or online MEML degree program and are admitted into one program cohort or the other. The admission standards are the same for both programs.

Applications for the Engineering Management and Leadership degree are due by October 30 for spring admission and April 30 for fall admission. When completing the online application, candidates will be asked to submit the following items electronically to the Graduate Admissions Committee by each program's deadline outlined above.

- Transcripts from all undergraduate and graduate schools attended.
- All student applicants must upload an unofficial transcript to the application and also send an official copy of their transcripts.
- A Statement of Purpose is required for all applicants. This statement should clearly and succinctly summarize the applicant's past academic and professional experience and achievements, discuss their motivation for seeking the MEML degree, and explain or articulate their future goals. The applicant should also briefly discuss any other factors they might want the Admission Committee to consider while reviewing their application (e.g., personal background, work experience, leadership roles, etc.).
- At least three letters of recommendation should be requested from at least three individuals, preferably professors, research advisors, or direct supervisors, who are familiar with the applicant's technical skills in engineering, science, or computer science. An applicant may submit more than three letters of recommendation, but no less than three must be submitted with their application.
- Graduate Record Examination (GRE) scores are optional for all applicants. If an applicant has relevant industrial experience, the Admissions Committee will factor in work experience and the recommendation of the applicant's current supervisor in lieu of any GRE scores when evaluating the application. Furthermore, at least one of the recommendation letters must be from a supervisor and should speak to the applicant's technical and communication promise/ability and any relevant industrial experience should be highlighted in the applicant's resume. If taking the GRE, applicants should have their scores sent directly to Rice University using code: 6609 (GRE subject tests are not required).
- TOEFL/IELTS scores are required for all international students that have not conferred a degree from an English-speaking University. The code to send the electronic scores is: 6609
 - TOEFL score, the minimum is 90 on the iBT and 600 on the paper-based TOEFL.
 - IELTS score, the minimum is 7.
 - This requirement is automatically waived for eligible applicants who upload their transcript from an English-speaking University into this application showing a degree in-progress or conferred.
- CV/Resume - applicants should upload their most current Curriculum Vitae or Resume.
- The application fee of \$85 can be paid either by credit card or electronic check. At this time, the Rice Center for Engineering Leadership considers application fee waiver requests on a case-by-case basis and is typically afforded to students who have attended information sessions about the MEML degree. Payment of the application fee cannot be deferred until time of enrollment. The application will be processed only when the application fee has been received.

Financial Aid

- No financial aid is available from Rice University for students in the MEML degree program.
- Very limited scholarships are available for the MEML degree. To apply for a scholarship, please contact the Rice Center for Engineering

Leadership directly by emailing rcel@rice.edu. Decisions are made by the Center and are final.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer) (<https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer>). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

Program Transfer Credit Guidelines

Students pursuing the MEML degree should be aware of the following program-specific transfer credit guidelines:

- No more than 2 courses (6 credit hours) of credit from another U.S. or international universities of similar standing as Rice may apply towards the degree. Transfer coursework must be comparable in content and depth to the corresponding course at Rice, and must not have counted toward another degree.
- Requests for transfer credit will be considered by the Engineering Management and Leadership Graduate Committee Chair and the instructor of the equivalent Rice course.

Additional Information

For additional information, please see the Engineering Leadership website: <https://www.rice.edu/engineeringleaders> (<https://www.rice.edu/engineeringleaders/>)

Opportunities for the MEML Degree, Online Program

Certificates of Engineering Management and Leadership (CEML)

Additionally, the Center offers two standalone and stackable graduate Certificates of Engineering Management and Leadership (CEML), one in *Engineering Project Management* and the other in *Product Management for Engineering Leaders*. The CEML program allows talented technical professionals to enroll in graduate-level engineering courses and earn a transcripted credential without completing an entire master's degree. Graduate certificate students can gain partial exposure to the high-quality Rice education, yet not make a full commitment to a full graduate degree all at once. However, the two CEML certificates are stackable, and graduate students who pursue a CEML certificate may decide to continue on, or return for a MEML degree.

Additional Information

For additional information, please see the Engineering Leadership website: <https://www.rice.edu/engineeringleaders> (<https://www.rice.edu/engineeringleaders/>)