

ENGINEERING LEADERSHIP

Contact Information

Engineering Leadership
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The mission of the Rice Center for Engineering Leadership (RCEL) is to educate and develop and inspire Rice Engineers to become ethical leaders in technology who will excel in research, industry, enabling (non-engineering) career paths, or bold entrepreneurship. RCEL programming enhances traditional undergraduate education by developing skills that are not expressly covered by the traditional curricula from the School of Engineering. Ultimately, the goal of the Certificate in Engineering Leadership is to equip engineering students with the critical technical, communication, and leadership skills necessary to succeed and excel professionally.

The Certificate in Engineering Leadership is designed to familiarize undergraduate students with key leadership concepts and allow them to practice the skills necessary to function effectively in a variety of leadership roles in a global and national economy within a workplace, which is often increasingly diverse and multi-cultural. Through coursework, extracurricular activities, internship support, and community events, the Certificate in Engineering Leadership lays a foundation for leadership advancement within 3-5 years of graduation while also teaching students to envision their career impact beyond the 10-year horizon. RCEL programming covers a range of important competency domains, including such topics as creative problem solving, conflict resolution, developing self-awareness, setting goals, project management, oral/written communication, teamwork, and ethics.

Certificate

- [Certificate in Engineering Leadership \(https://ga.rice.edu/programs-study/departments-programs/engineering/engineering-leadership/engineering-leadership-certificate/\)](https://ga.rice.edu/programs-study/departments-programs/engineering/engineering-leadership/engineering-leadership-certificate/)

Engineering Leadership does not currently offer an academic program at the graduate level.

Faculty Director

C. Fred Higgs, III, *John and Ann Doerr Professor of Mechanical Engineering*

Executive Director

Kazimir I. Karwowski

Professors in the Practice

James P. Hennessy
 Sergio D. Kapusta

Tom Phalen
 David A. Van Kleeck

Lecturers

Kazimir I. Karwowski
 Jerlyn Mardis
 Gayle M. Moran
 Elizabeth O'Sullivan
 Germaine Porche
 George Webb

For Rice University degree-granting programs:

To view the list of official course offerings, please see [Rice's Course Catalog \(https://courses.rice.edu/admweb!/SWKSCAT.cat?p_action=cata\)](https://courses.rice.edu/admweb!/SWKSCAT.cat?p_action=cata)

To view the most recent semester's course schedule, please see [Rice's Course Schedule \(https://courses.rice.edu/admweb!/SWKSCAT.cat\)](https://courses.rice.edu/admweb!/SWKSCAT.cat)

Rice Center for Engineering Leadership (RCEL)

RCEL 100 - SELF-AWARENESS AND THE ENGINEERING LEADER

Short Title: SELF-AWARENESS & THE ENGINEER

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hours: 2

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Lower-Level

Description: The purpose of this course is to prepare students to become future leaders. Engineering leadership is an emerging innovation in both education and practice and our course will prepare students to being their development journey toward this goal. Mutually Exclusive: Cannot register for RCEL 100 if student has credit for ENGI 140/ENGI 218.

RCEL 200 - PERSONAL DEVELOPMENT FOR THE ENGINEERING LEADER

Short Title: PERSONAL DEVELOPMENT ENG LEADR

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hours: 2

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Lower-Level

Prerequisite(s): RCEL 100

Description: The purpose of this course is to prepare students to become future leaders. Engineering leadership is an emerging innovation in both education and practice and our course will prepare students to being their development journey toward this end. This is the second half of the initial RCEL leadership course. Mutually Exclusive: Cannot register for RCEL 200 if student has credit for ENGI 140/ENGI 218.

RCEL 238 - SPECIAL TOPICS

Short Title: SPECIAL TOPICS

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Laboratory, Seminar, Lecture, Internship/Practicum

Credit Hours: 1-4

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Lower-Level

Description: Topics and credit hours may vary each semester. Contact department for current semester's topic(s). Repeatable for Credit.

RCEL 241 - INTERNSHIP PRACTICUM FOR ENGINEERING LEADERSHIP

Short Title: INTERNSHIP PRACTICUM FOR ENGI

Department: Center Engineering Leadership

Grade Mode: Satisfactory/Unsatisfactory

Course Type: Internship/Practicum

Credit Hour: 1

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Lower-Level

Description: RCEL 241 is an applied practicum and internship course that provides guided career and professional development for engineering students in a real-world industrial, academic, research, or other professional context. It prepares students to assimilate quickly and to exceed employer expectations during their internships. This course offers variable credit (0 or 1 credit). If you choose to take the course for 1 credit, you must indicate your intent with the instructor upon registration. Mutually Exclusive: Cannot register for RCEL 241 if student has credit for ENGI 241. Repeatable for Credit.

RCEL 300 - DEVELOPMENT OF HIGH PERFORMING ENGINEERING TEAMS

Short Title: DEVELOPMENT OF HIGH PERFORMING

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hours: 2

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Upper-Level

Prerequisite(s): RCEL 200

Description: The purpose of this course is to prepare students for engineering leadership and followership roles in engineering contexts. This course is required for our school's certificate engineering leadership and includes a focus on practical skills and how these skills can be learned, developed, and applied in team situations. Mutually Exclusive: Cannot register for RCEL 300 if student has credit for ENGI 219/ENGI 315.

RCEL 400 - LEADING HIGH PERFORMING ENGINEERING TEAMS

Short Title: LEADING HIGH PERFORMING ENGINE

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hours: 2

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Upper-Level

Prerequisite(s): RCEL 300

Description: This course develops skills that are required for enterprise wide leadership positions. Topics include: managing and leveraging diversity, creative problem solving through intersectional thinking, ethical issue identification and resolution, risk management, performance management, development and communication of an enterprise wide vision, and development of a change management plan. Mutually Exclusive: Cannot register for RCEL 400 if student has credit for ENGI 219/ENGI 315.

RCEL 410 - ENGINEERING LAUNCH PAD-RESEARCH

Short Title: ENG LAUNCH PAD-RESEARCH

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hour: 1

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Upper-Level

Prerequisite(s): ENGI 100

Description: RCEL 410 is one of four RCEL courses intended to jump-start the next steps for aspiring engineering leaders. The other courses deal with industry, Alternative Pathways, and Entrepreneurship, while RCEL 410 is focused on developing an understanding of leadership principles applicable in a Research environment. Students will gain insights into managing ethical dilemmas, developing communication strategies, creating a vision and goals, and project management in either an undergraduate or graduate student level engineering discipline. Research in academia, government labs, and industry will be compared and contrasted.

RCEL 420 - ENGINEERING LAUNCH PAD-INDUSTRY

Short Title: ENGINEERING LAUNCH PAD-INDUST

Department: Center Engineering Leadership

Grade Mode: Standard Letter

Course Type: Lecture/Laboratory

Credit Hours: 2

Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.

Course Level: Undergraduate Upper-Level

RCEL 430 - ENGINEERING LAUNCH PAD-NON-ENGINEERING PATHWAYS**Short Title:** ENGINEERING LAUNCH PAD-PATHWAY**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Lecture/Laboratory**Credit Hour:** 1**Restrictions:** Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.**Course Level:** Undergraduate Upper-Level**Description:** Engineering students explore alternative professional paths, including policy, law, medicine, industry consulting, and other viable career options beyond industry and research. Students will identify a focus career track and complete a series of assignments designed to increase familiarity and competency in that discipline.**RCEL 440 - ENGINEERING LAUNCH PAD-ENTREPRENEURSHIP****Short Title:** ENGINEERING LAUNCH PAD-ENTREPR**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Lecture/Laboratory**Credit Hour:** 1**Restrictions:** Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.**Course Level:** Undergraduate Upper-Level**Description:** This course will focus on identifying the value proposition a potential venture has for a specific customer segment, and who those customers are and why. Students will be forced to “get out of the building” and interview potential customers to help refine their assumptions based on data. The goal is to help the teams create a scalable and repeatable business model for their venture.**RCEL 450 - ENGINEERING PROJECT MANAGEMENT AND LEADERSHIP ACTION LEARNING****Short Title:** PROJECT MANAGEMENT AND LEADERS**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Lecture/Laboratory**Credit Hours:** 2**Restrictions:** Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.**Course Level:** Undergraduate Upper-Level**Description:** RCEL 450 combines project management and a practicum experience allowing students to practice leadership skills in an applied context utilizing a project. During the semester, each student will serve in a primary leadership capacity for a project. In addition to facilitating the project management of the project, each student will participate in an individualized action learning based model of leadership. Instructor Permission Required. Mutually Exclusive: Cannot register for RCEL 450 if student has credit for ENGI 317.**RCEL 477 - SPECIAL TOPICS****Short Title:** SPECIAL TOPICS**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Internship/Practicum, Seminar, Lecture, Laboratory**Credit Hours:** 1-4**Restrictions:** Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.**Course Level:** Undergraduate Upper-Level**Description:** Topics and credit hours may vary each semester. Contact department for current semester's topic(s). Repeatable for Credit.**RCEL 530 - ENGINEERING LAUNCH PAD-NON-ENGINEERING PATHWAYS****Short Title:** ENGINEERING LAUNCH PAD-PATHWAY**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Lecture/Laboratory**Credit Hour:** 1**Restrictions:** Enrollment is limited to Graduate level students.**Course Level:** Graduate**Description:** Engineering students explore alternative professional paths, including policy, law, medicine, industry consulting, and other viable career options beyond industry and research. Students will identify a focus career track and complete a series of assignments designed to increase familiarity and competency in that discipline.**RCEL 610 - ETHICS FOR ENGINEERS****Short Title:** ETHICS FOR ENGINEERS**Department:** Center Engineering Leadership**Grade Mode:** Standard Letter**Course Type:** Lecture**Credit Hours:** 3**Restrictions:** Enrollment is limited to students with a major in Applied Physics/Bioengineering, App Phys/Chem-Biomolecular Eng, Applied Physics/Electrical Eng, Applied Physics/Mechanical Eng, Appl Phys/Materials Sci NanoEn, Applied Physics/Statistics, Bioengineering, Computational & Applied Math, Chemical Engineering, Civil Engineering, Computer Science, Computational Science & Eng, Electrical & Computer Eng., Electrical Engineering, Environmental Engineering, Industrial Engineering, Mechanical Engineering, Materials Science & NanoEng, Systems/Synthetic/Phys Biology or Statistics. Enrollment is limited to Graduate level students.**Course Level:** Graduate**Description:** Engineers can encounter a variety of ethical issues and dilemmas in fulfilling their professional responsibilities. Ethical problems can be considered somewhat analogous to engineering design problems: both involve significant complexities, high degrees of uncertainty, a number of boundary conditions and constraints, conformance with criteria, identification and evaluation of alternatives responses, and deciding on the best solution or action. This course will prepare engineering students to understand the ethical issues related to their profession, analyze the various options and alternative course of actions, and implement the solutions to their ethical problems.

Description and Code Legend

Note: Internally, the university uses the following descriptions, codes, and abbreviations for this academic program. The following is a quick reference:

Course Catalog/Schedule

- Course offerings/subject code: RCEL

Center Description and Code

- Rice Center for Engineering Leadership: RCEL

Undergraduate Certificate Description and Code

- Certificate in Engineering Leadership: CEL

CIP Code and Description ¹

- CEL Certificate: CIP Code/Title: 52.0213 - Organizational Leadership

¹ Classification of Instructional Programs (CIP) 2020 Codes and Descriptions from the National Center for Education Statistics: <https://nces.ed.gov/ipeds/cipcode/>