Engineering & Computing (CEC)

CEC 101. Computing, Engineering & Society. (1)
This course is designed for first-year students with majors in the College of Engineering and Computing. Its goal is to facilitate student transition to college by introducing key information, resources, and skills needed to succeed. It will also introduce students to the curriculum and fields in engineering and computing and provide opportunities to connect with faculty, staff, and other students. This course facilitates opportunities for open discussion and individual advising; addresses issues including information literacy, academic integrity, personal responsibility and career development; and identifies key campus resources to enhance academic success.

CEC 102. Problem Solving and Design. (3)
This course introduces an approach to problem solving for engineering students. The students will learn systematic approaches to problem solving. Topics covered include: problem identification, requirement analysis, research on existing and alternative solutions, and quantitative analysis of solutions, synthesis and evaluation of data, prototyping, and testing. Students will also develop their oral and written communication skills as well as team work skills. Credit will be given for only one of CPB 102, CSE 102, ECE 102, MME 102, CEC 102.

CEC 111. Imagination, Ingenuity and Impact I. (2)
This course is for first-year students interested in exploring engineering and computing. Students engage in hands-on, interdisciplinary design that addresses societal and environmental challenges. Students work in teams to design innovative solutions and develop communications skills. The course facilitates student transition to college by introducing key information, resources, and skills needed to succeed. It addresses issues including information literacy, academic integrity, personal responsibility and career development; and identifies key campus resources to enhance academic success. SI-02, SI-03.

CEC 112. Imagination, Ingenuity, and Impact II. (2)
Students engage in hands-on interdisciplinary design that addresses societal and environmental challenges. Students work in teams to apply design thinking principles and computing to solve open-ended problems related to socio-environmental issues. Students acquire computational and engineering skills and develop their communication abilities. SI-01, SI-03.

CEC 130. Special Topics and Student Projects I. (1-3; maximum 6)
Introductory level course focused on a special topic and/or interdisciplinary student project.
Cross-listed with ESP.

CEC 140. Grand Challenge Scholars Experience. (1; maximum 6)
This course is restricted to students in the Grand Challenge Scholars Program (GCSP). It will ensure that students meet particular GCSP requirements such as submission of progress reports, submission of reflections, participation in the Grand Challenge Scholar in Residence program, and participation in the peer mentor program. Students are required to enroll in this course each semester (fall and spring) that they participate in the GCSP with a minimum of three semesters of participation.
Prerequisite: Admission to the Grand Challenge Scholars Program.

CEC 150. CEC Scholars Seminar. (0)
This seminar for Engineering and Computing Scholars will bring in weekly guest speakers from across Miami to introduce the Scholars to valuable people, centers, and opportunities. It will also help the students build a core community for future networking.

CEC 177. Independent Studies. (0-6; maximum 10)

CEC 222. Socio-Environmental Responsibility in Engineering and Computing. (3)
Students explore the first two phases of the design thinking process -- empathizing with a community and defining a problem -- by engaging with a local community and actively listening to community stakeholders. Students practice civic engagement and service to others by proposing an engineering and/or computing design solution to the identified problem. The design solution is required to take into account interdisciplinary research and multiple considerations, including societal, environmental, cultural, historical, ethical, and economic factors. Students reflect on their experience with the early steps of the design thinking process and present their initial design. Students analyze and facilitate discussions on interdisciplinary readings and case studies exemplifying existing solutions and their impact on communities. SI-01, SI-02.

CEC 230. Special Topics and Student Projects II. (1-3; maximum 6)
Fundamental activities in the research and implementation of a special topic and/or interdisciplinary student project.
Prerequisite: permission of instructor.
Cross-listed with ESP.

CEC 266. Globalization and Engineering in Heavy Metal Music. (3)
This course addresses the linkages among heavy metal music, global culture and engineering developments. Heavy metal is a truly global popular music with major impacts from Europe, Asia, the Americas and beyond. Advances in various technologies have extensively influenced heavy metal, enabling some of its most defining characteristics. This course explores the interplays of technology, music and culture by integrating the powerful history of metal with an overview of the engineering impacts. Students will engage in demonstrations and discussions of the musical breadth along with the engineering technologies. IC, IIIB. PA-4C.

CEC 277. Independent Studies. (0-6; maximum 10)

CEC 291. Personal Leadership I. (2)
The 200 level courses are designed for the CEC Leadership Institute sophomore cohort. They introduce the various dimensions of personal leadership to assist students in understanding the traits for becoming a better leader in their professional and personal lives. These courses span an academic year and serve as a dynamic, integrative and practical introduction to a leadership development program. Students will explore emotional intelligence, teamwork, crucial conversations and group dynamics. The activities in these courses will help students define individual personality preferences, strengths and areas of development and understand how to utilize the self-awareness to become more effective leaders. With the guidance of advisors, students will create their individual leadership plans. Students will also interact with a variety of executives and professionals from diverse industries.

CEC 292. Personal Leadership II. (1-2)
Continuation of CEC 291.
Prerequisite: CEC 291.

CEC 330. Special Topics and Student Projects III. (1-3; maximum 6)
Intermediate-level activities in the research, management and implementation of a special topic or project in engineering and computing with a focus on innovation.
Prerequisite: CEC 230.

CEC 340. Internship. (0-20)

CEC 377. Independent Studies. (0-6; maximum 10)

CEC 391. People Leadership I. (2)
The 300 level courses are designed for the CEC Leadership Institute junior cohort. They focus on various dimensions of leading others, and assist students in becoming better leaders in their professional and personal lives. These courses span the second year of a dynamic, integrative and practical leadership development program. Students will explore creativity (brainstorming, creative conflict, storyboarding), negotiation, listening and speaking skills, conducting meetings, diversity (cultural, gender, age awareness), how others perceive them (360 reviews), and related topics. Students will continue to implement and revise their personal leadership development plans created in the first year, and deepen their relationships with executive mentors and peers.
Prerequisite: CEC 292.

CEC 392. People Leadership II. (1-2)
Continuation of CEC 391.
Prerequisite: CEC 391.

CEC 460. Special Topics in Engineering and Computing. (1-3; maximum 6)
Topics in engineering and/or computing beyond the technical requirements of a major. These topics and activities may be of an interdisciplinary nature, not restricted to a specific department.

CEC 477. Independent Studies. (0-6; maximum 10)

CEC 491. Strategic Leadership I. (1-2; maximum 2)
The 400 level courses are designed for the CEC Leadership Institute senior cohort. These courses span the third and final year of a dynamic, integrative and practical leadership development program and focus on various dimensions of strategic leadership and the transition from college to future careers. Topics to be explored include strategic planning, customer focus, decision analysis, ethics/values, global and diversity perspectives, innovation, and the language of business.
Prerequisite: CEC 392.

CEC 492. Strategic Leadership II. (1-2; maximum 2)