Fall 2020 Course Descriptions as of 04/05/2020 08:10 PM

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Architectural Engineering (ARCE)

ARCE 210: Building Information Modeling for Engineers (3 units)
Description: This course focuses on the role of Building Information Modeling (BIM) in Architecture and Engineering. Students will learn the fundamental processes of BIM based on 3D computer drafting, including site analysis and data extraction, basic model building, dimensioning, planning, and elevations, parametric modeling, documentation, and 3D rendering.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ARC 210
Course typically offered:
Main Campus: Spring

Home department: School of Architecture
Enrollment requirement: (ENGR 102A and ENGR 102B) or ENGR 102. College of Engineering students only.

ARCE 222: Building Technologies I (3 units)
Description: This course introduces fundamentals of structural and environmental forces and flows in building design for environmentally adaptive systems.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Workshop Required
Also offered as: ARC 222
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ARC 221. Open to majors only.
Home department: School of Architecture

ARCE 223: Building Technology III, EAS I (3 units)
Description: This course introduces fundamentals of environmentally adaptive architectural design, including bioclimatics, electromagnetics, fluid physics, and the related interactions with materials, form, and spatial composition.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Lecture Required
Also offered as: ARC 223
Course typically offered:
Main Campus: Spring

Home department: School of Architecture

ARCE 293: INTERNSHIP (1 - 3 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Field trip: None

ARCE 295: Introduction to Architectural Engineering (1 unit)
Description: The main course objective is to familiarize students with the possible careers in the architectural engineering field. The course is provided in colloquium style and designed to help students understand the Architectural Engineers (ARCE) roles responsibilities, and career opportunities. Students will interact with invited speakers and explore various ARCE roles in designing and constructing building systems including structural, heating/ventilation and air conditioning, plumbing and electrical systems.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Colloquium Required
Course typically offered:
Main Campus: Fall

Enrollment requirement: Math 122A/B or Math 124 or Math 125. All engineering degree disciplines including no major selected or consent of Civil Engineering department are required to register for the course.

ARCE 299: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer 1 and 2

Field trip: None

ARCE 320: Power system Engineering (3 units)
Description: The main course objective is to introduce students to the requirements, analysis and design of electrical and power systems for residential and commercial buildings. The course is provided in lecture format electrical systems.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Enrollment requirement: Adv Stdg: Engineering. ENGR 211M.

ARCE 330: On Light and Lighting (3 units)
Description: This course focuses on Light and Lighting in its various forms from Technology and Science, via the Human Condition to the Built Environment. The Students will hear about Theory, History and Culture; Physics and Optics; Science and Technology. Hands on design exercises will enable the Students a basic knowledge for documentation, to develop channels of communication and language, tools to evaluate data and synthesize the information.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ARC 330
Course typically offered:
Main Campus: Spring

Field trip: Site Visit 1 : Biosphere II Transportation Cost varies (Shared $10-50)Site Visit 2 : SMOCA Transportation Cost Varies (Shared $15-60)Site Visit 3 : Kitt Peak Transportation Cost Varies (Shared $10-50)
Home department: School of Architecture
Enrollment requirement: Adv Stdg: Engineering and ENGR 211M .College of Engineering students only.

ARCE 340: Introduction to Mechanical Systems in Building Design (3 units)
Description: This course introduces students to a comprehensive list of mechanical systems and system options encountered in the wide range of building use types encompassed in building sciences. The ideal relationship of these mechanical systems to other building systems and design disciplines will be explored. Coordination needs and responsibilities during design, construction and commissioning phases for both new and retrofit projects will be examined. A framework for system selection based on defensible engineering and/or construction practices will be developed and mechanical systems and system options with potential for energy and/or sustainability impacts will be emphasized. Basic codes, standards and guidelines will be introduced. Basic design skills including options and compromises for sizing and routing of duct, pipe and drainage systems will be developed. Students will tour one or more buildings on or near campus with the intent of identifying mechanical systems, visualizing the spatial requirements of those systems and recognizing their impacts to adjacent building systems. A team project will be utilized to apply and reinforce various concepts including source system location, duct, pipe and drainage distribution system sizing and routing. Various communicating documents (plans, sections, details, equipment schedules, specifications, submittals, RFIs) and their use with various intended audiences (owner/developer, design team, constructor, commissioning agent) will be analyzed.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Enrollment requirement: Adv Stdg: Engineering. Pre-requisite: ARCE 210 and ARCE 295

ARCE 393: Internship (1 - 3 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Field trip: None
Enrollment requirement: Adv Stdg: Engineering.

ARCE 399: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer 1 and 2

Field trip: None
Enrollment requirement: Adv Stdg: Engineering.

ARCE 400B: Senior Engineering Design (3 units)
Description: Students will use the architectural building they designed in ARC/ARCE 400A as a framework to engineer building systems including mechanical HVAC, electrical power and lighting, structural, plumbing, and fire protection. Students will apply their knowledge of architectural engineering using visioning, conceptualization, quantitative analysis, value engineering, and presenting solutions.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Studio Required
Repeatable: Course can be repeated a maximum of 2 times.
Course typically offered:
Main Campus: Spring

Field trip: Depending on projects available to visit

ARCE 408A: Issue in Professional Practice (1 unit)
Description: Introduction to non-technical issues impacting the practice of design professionals in the private and public sectors including: types of organizations; income, expenses, and profit; quality-based selection for obtaining and performing work; contracts; dispute resolution methods; professional ethics.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall

Field trip: None
Enrollment requirement: Engineering Advance Standing. At least two (2) of ARCE 320, ARCE 340, CE 333, CE 381. Co-requisites: CE 301 and ARC 400A.

ARCE 408B: Issues In Professional Practice II (1 unit)
Description: Introduction to non-technical issues impacting the practice of design professionals in the private and public sectors including: design phases and documentation; errors, omissions, insurance; types of delivery methods; building and material life-cycles; diversity; types of organizations; roles of an architectural engineer; professional development.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Spring

Field trip: None
Enrollment requirement: Adv Stdg: Engineering.Co-Requisite ARCE 400BPre-Requisites CE 301, ARC 400A, ARCE 408A and at least three (3) of the following courses: ARCE 320, ACRE 340, CE 333, CE 381

ARCE 493: Internship (1 - 3 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

Field trip: None

ARCE 499: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring, Summer 1 and 2

Field trip: None
Enrollment requirement: Adv Stdg: Engineering.