

Fall 2020 Course Descriptions as of 04/05/2020 08:11 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: http://rcs.registrar.arizona.edu/course_descriptions_key.

Engineering Mechanics (EM)

EM 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 99 times.

Enrollment requirement: Adv Stdg: Engineering.

EM 493: Internship (1 - 5 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 99 times.

Enrollment requirement: Adv Stdg: Engineering.

EM 499: Independent Study (1 - 5 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 99 times.

Enrollment requirement: Adv Stdg: Engineering.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

Description: Theory and formulation procedures: energy and residual. One-dimensional problems: stress analysis in axial structures, steady and transient fluid and heat flow, consolidation, wave-propagation, beam-column. Two-dimensional problems: field and plane/axisymmetric, use of computer codes for solution to typical problems. Graduate-level requirements include research on a single aspect of the finite element method.

Career: Graduate

Equivalent to: EM 502

Also offered as: CE 502

Course typically offered:

Main Campus: Fall, Spring

EM 504: Elasticity Theory and Application (3 units)

Description: General three-dimensional equations of elasticity; problems in plane stress, plane strain, extension, torsion; energy, residual and other solution methods; applications to rings, beams, plates, torsion and other problems.

Grading basis: Regular Grades

Career: Graduate

Course Components:	Lecture	Required
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Course typically offered:

Main Campus: Fall, Spring

Description: Modes of fracture; crack propagation; Griffith energy balance; crack tip plasticity; J-integral; fatigue cracks; analytical and numerical techniques; constitutive models for damaged materials.

Grading basis: Regular Grades

Career: Graduate

Course Components:	Lecture	Required
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Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: EM 504 or AME 564A.

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

EM 593: Internship (1 - 5 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: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

EM 596A: Research Topics (1 unit)

Description: For CE and EM majors, research presentation only.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Seminar Required

Repeatable: Course can be repeated a maximum of 2 times.

Equivalent to: EM 596A

Also offered as: CE 596A

Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: May be repeated one time for credit when enrolled in the Ph.D. program.

Home department: Civil and Architectural Engineering and Mechanics

EM 599: Independent Study (1 - 5 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

EM 605: Mechanical Behavior of Materials II - Special Topics (3 units)

Description: Some of the following topic areas are covered in this class: theory of elasticity, plasticity, numerical methods, constitutive modeling, advanced structural mechanics, wave propagation, fracture. The detailed course content varies from semester to semester and could have interdisciplinary components; students should contact the department for details.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: EM 504 or AME 564A or equivalent.

EM 606: Wave Propagation in Solids (3 units)

Description: [Usually offered every other Spring beginning 2003] Stress (acoustic wave propagation and dispersion in infinite solids and finite wave guides), application of wave propagation theory in destructive and nondestructive evaluation of materials and structures; dynamic failure behavior of materials.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: AME 606, AME 660, CE 660, EM 606, EM 660

Also offered as: AME 606, CE 606

Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: AME 564A or AME 564B.

Home department: Civil and Architectural Engineering and Mechanics

EM 633: Structural Dynamics and Earthquake Engineering (3 units)

Description: Vibrations and dynamic response of structural systems to periodic and arbitrary loadings and support motion; response spectrum and step-by-step formulations for seismic analysis and design.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Fall, Spring

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May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

EM 634: Advanced Structural Dynamics (3 units)

Description: This graduate-level course is designed to give student an in-depth understanding of the advanced concepts in structural dynamics. Topics include modal analysis theory and implementation, data acquisition and analysis, digital signal processing, random vibration concepts, system identification, structural health monitoring and damage detection, advanced sensor technologies, and smart structure technologies. A big portion of the course will be devoted to the fundamentals of numerical simulations and experimental methods in structural dynamics, exposing students to state-of-the-art simulation software and dynamic testing equipment and providing practical laboratory experience. For many problems, such simulation and testing is essential to validate new structural concepts, as well as to understand structural responses and failures that are not readily explained by intuition, analytical models, or previous experience.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$50

Course Components: Lecture Required

Course typically offered:

Main Campus: Fall, Spring

Recommendations and additional information: EM 633 or knowledge of Structural Dynamics.

Field trip: 1-2 field trips for modal testing of bridge structures in campus or Tucson area.

EM 900: Research (1 - 3 units)

Description: Individual research, not related to thesis or dissertation preparation, by graduate students.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

EM 909: Master's Report (1 - 12 units)

Description: Individual study or special project or formal report thereof submitted in lieu of thesis for certain master's degrees.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

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EM 910: Thesis (1 - 12 units)

Description: Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

EM 920: Dissertation (1 - 12 units)

Description: Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing).

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

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