MECHANICAL ENGINEERING (MECH)

See Course Description Symbols and Terms (https://catalog.csuchico.edu/academic-standards-policies/course-description-symbols-terms/) for an explanation of course description terminology and symbols, the course numbering system, and course credit units.

<table>
<thead>
<tr>
<th>Course</th>
<th>Type</th>
<th>Units</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 100</td>
<td>Graphics I</td>
<td>1</td>
<td>Corequisites: MECH 100L.</td>
</tr>
<tr>
<td>MECH 100L</td>
<td>Graphics I Laboratory</td>
<td>1</td>
<td>Corequisites: MECH 100.</td>
</tr>
<tr>
<td>MECH 140</td>
<td>Introduction to Design and Automation</td>
<td>2</td>
<td>Prerequisite: MATH 119 or GE Mathematics/Quantitative Reasoning Ready, first-year freshmen who successfully completed trigonometry and precalculus in high school can meet this prerequisite by achieving a score that meets department guidelines on the calculus readiness exam.</td>
</tr>
<tr>
<td>MECH 198</td>
<td>Special Topic</td>
<td>1-3</td>
<td>Typically Offered: Inquire at department</td>
</tr>
</tbody>
</table>

Typically Offered:
Fall and spring

MECH 200 Graphics II
Prerequisite: MECH 100 and MECH 100L.
Typically Offered: Fall and spring
A study of advanced topics in Engineering Graphics. Concepts include drawing standards, geometric dimensioning and tolerancing, working drawings, model based definition, intermediate to advanced solid modeling, advanced assemblies, renderings, animations, equations, and design considerations. Preparation for advanced certifications in Engineering Graphics. 3 hours laboratory, 1 hour lecture. (015854) Grade Basis: Graded Repeatability: You may take this course for a maximum of 2 units Course Attributes: Lower Division

MECH 208 Introduction to Technical Computing
Prerequisite: MATH 121. Recommended: PHYS 204A.
Typically Offered: Fall and spring
A foundation course in technical computing for engineering. Introduces commercial software commonly used in the solution of engineering problems. Application areas include kinematics and kinetics, fluid flow, thermal systems, and machine design. 3 hours laboratory, 1 hour lecture. (021113)
Grade Basis: Graded Repeatability: You may take this course for a maximum of 2 units Course Attributes: Lower Division

MECH 210 Materials Science and Engineering
Prerequisite: CHEM 107 or CHEM 111, PHYS 202A or PHYS 204A.
Corequisites: MECH 210L for MECA, MECH, and AMAR majors only.
Typically Offered: Fall and spring
Processing, structure, properties, and performance of engineering materials. Applied knowledge of material properties as engineering design parameters. Advanced manufacturing processes, including microfabrication are discussed. 3 hours discussion. (005402)
Grade Basis: Graded Repeatability: You may take this course for a maximum of 3 units Course Attributes: Lower Division

MECH 210L Materials Science and Engineering Laboratory
Corequisites: MECH 210 for AMAR, MECA, and MECH majors only.
Typically Offered: Fall and spring
Standards and procedures for materials testing. Hands-on experience with commonly used equipment for materials testing. Test data acquisition and integration for material properties. Presentation of test data and findings in technical reports. 3 hours laboratory. (021645)
Grade Basis: Graded Repeatability: You may take this course for a maximum of 1 unit Course Attributes: Lower Division

MECH 298 Special Topic
Prerequisite: To be established when course is formulated.
Typically Offered: Inquire at department
Special topic generally offered one time only. Different sections may have different topics. See the Class Schedule for specific topic being offered. 3 hours lecture. (015855)
Grade Basis: Graded Repeatability: You may take this course more than once Course Attributes: Lower Division

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<tr>
<td>MECH 306</td>
<td>Equation Solving Techniques</td>
<td>3</td>
<td>MATH 260, MECH 208. Recommended: PHYS 204A.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
<td>Credit/No Credit</td>
</tr>
<tr>
<td>MECH 308</td>
<td>Finite Element Analysis</td>
<td>3</td>
<td>CIVL 311 with a grade of C- or higher, MECH 306.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
<td>Credit/No Credit</td>
</tr>
<tr>
<td>MECH 320</td>
<td>Dynamics</td>
<td>3</td>
<td>CIVL 211 with a grade of C- or higher, MATH 260.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
<td>Credit/No Credit</td>
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<tr>
<td>MECH 332</td>
<td>Thermodynamics</td>
<td>3</td>
<td>PHYS 204A.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
<td>Credit/No Credit</td>
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<tr>
<td>MECH 338</td>
<td>Heat Transfer</td>
<td>4</td>
<td>CIVL 321, MATH 260, MECH 332. Recommended: MECH 306.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
<td>Credit/No Credit</td>
</tr>
<tr>
<td>MECH 340</td>
<td>Mechanical Engineering Design</td>
<td>4</td>
<td>CIVL 311 with a grade of C- or higher, MECH 100, MECH 100L, MECH 140, MECH 210, AMAR 160. Recommended: MECH 320.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>Graded</td>
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<tr>
<td>MECH 398</td>
<td>Special Topic</td>
<td>1-3</td>
<td>To be established when course is formulated.</td>
<td>Fall and spring</td>
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<td>You may take this course more than once</td>
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<td>MECH 399</td>
<td>Special Problems</td>
<td>1-3</td>
<td>Approval of supervising faculty member.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>You may take this course for a maximum of 6 units</td>
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<tr>
<td>MECH 408</td>
<td>Modeling and Simulation</td>
<td>3</td>
<td>MECH 200, MECH 308, MECH 338, MECH 340.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
<td>You may take this course for a maximum of 3 units</td>
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</table>
MECH 410  Advanced Materials Science and Engineering  3 Units  
Prerequisite: MATH 260, MECH 210. Recommended: CIVL 311. 
Typically Offered: Inquire at department 
This course introduces students to the interdisciplinary field of nanoscale science and engineering including the areas of engineering, materials science, chemistry, and physics. The topics covered include advanced materials, synthesis and modification of nanomaterials, properties of nanomaterials, materials characterization, nanofabrication methods, and applications. It has three modules which are formal lectures, guest speakers, and projects. For the projects student learn to conduct a literature search on a given topic and are asked to present their project. They further have a chance to propose their own ideas for potential applications and are asked to give detailed methodology to execute the project. 3 hours discussion. (005437) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 9 units 
Course Attributes: Upper Division

MECH 424  Mechanical Vibrations  3 Units  
Prerequisite: MECH 320. 
Typically Offered: Inquire at department 
Free and forced vibrations of lumped parameter systems, transient vibrations, systems with several degrees-of-freedom. 3 hours discussion. (005437) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 3 units 
Course Attributes: Upper Division

MECH 432  Energy Systems  3 Units  
Prerequisite: MECH 338. 
Typically Offered: Fall and spring 
This course introduces students to the interdisciplinary field of nanoscale science and engineering including the areas of engineering, materials science, chemistry, and physics. The topics covered include advanced materials, synthesis and modification of nanomaterials, properties of nanomaterials, materials characterization, nanofabrication methods, and applications. It has three modules which are formal lectures, guest speakers, and projects. For the projects student learn to conduct a literature search on a given topic and are asked to present their project. They further have a chance to propose their own ideas for potential applications and are asked to give detailed methodology to execute the project. 3 hours discussion. (005437) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 4 units 
Course Attributes: Upper Division; Sustainable Course

MECH 433  Solar Energy Engineering  3 Units  
Prerequisite: CIVL 321; EECE 211 or EECE 215; MECH 338 (may be taken concurrently). 
Typically Offered: Inquire at department 
This introductory course covers the design and operation of solar photovoltaic (PV) and solar thermal systems. Foundational topics include solar radiation characteristics, solar materials, and heat transfer. Solar PV systems include cell operations, I-V characteristics, module design, maximum power-point tracking, charge controllers, batteries, inverters, design of grid-tied and off-grid systems, and system performance evaluation. Solar thermal systems include flat-plate collectors, concentrating collectors, passive and active solar water heating, solar space heating and cooling, and solar thermal power systems. 2 hours activity, 2 hours lecture. (021438) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 3 units 
Course Attributes: Upper Division; Sustainable Course

MECH 435  Low Speed Aerodynamics  3 Units  
Prerequisite: CIVL 321, MATH 260. Recommended: MECH 306. 
Typically Offered: Inquire at department 
Flow around elementary shapes, concepts of flow circulation, lift and drag. Incompressible inviscid flows around thin airfoils and wings of finite span. 3 hours discussion. (005444) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 3 units 
Course Attributes: Upper Division

MECH 440AW  Capstone Design I (W)  3 Units W, GW 
Prerequisite: GE Oral Communication (A1) requirement; GE Written Communication (A2) requirement; MECH 200; MECH 340 with a grade of C- or higher. Recommended: MECA 380, MECH 308, MECH 338. 
Typically Offered: Fall and spring 
Design methods applied to mechanical system in group design projects. Project definition, planning, and management. Design for manufacture, cost considerations, budgets, and teamwork. Oral and written presentation of design results. Initial stage of the capstone design project to be continued in MECH 440B. 2 hours lecture, 3 hours supervision. (005433) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 3 units 
Course Attributes: Upper Division; Writing Course; Graduation Writing Assessment

MECH 440B  Capstone Design II  3 Units 
Prerequisite: MECH 440AW. Recommended: MECA 380, MECH 308, MECH 338. 
Typically Offered: Fall and spring 
Continuation of the capstone design project from MECH 440AW including fabrication, testing, and evaluation of a working prototype. Impact of engineering solutions in global, economic, environmental, and societal context. Ethical and professional responsibilities in engineering including continuing self-education and career development. Must be taken the semester immediately following MECH 440AW. 2 hours lecture, 3 hours supervision. (005434) 
Grade Basis: Graded 
Repeatability: You may take this course for a maximum of 3 units 
Course Attributes: Upper Division
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<tr>
<td>MECH 498</td>
<td>Special Topic</td>
<td>1-3</td>
<td>To be established when course is formulated.</td>
<td>Inquire at department</td>
<td>You may take this course more than once</td>
<td>Graded</td>
<td>Upper Division</td>
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<tr>
<td>MECH 499</td>
<td>Special Problems</td>
<td>1-3</td>
<td>Approval of supervising faculty member.</td>
<td>Inquire at department</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Credit/No Credit</td>
<td>Upper Division</td>
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<tr>
<td>MECH 499H</td>
<td>Honors Project</td>
<td>3</td>
<td>Completion of 12 units of upper-division MECH courses, faculty permission.</td>
<td>Inquire at department</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graded</td>
<td>Upper Division</td>
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<tr>
<td>MECH 697</td>
<td>Independent Study</td>
<td>1-3</td>
<td>Approval of supervising faculty member.</td>
<td>Inquire at department</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Report in Progress: Graded</td>
<td>Graduate Division</td>
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<tr>
<td>MECH 699P</td>
<td>Master's Project</td>
<td>1-6</td>
<td>Approval of supervising faculty member.</td>
<td>Inquire at department</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Report in Progress: CR/NC</td>
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<td>MECH 699T</td>
<td>Master's Thesis</td>
<td>1-6</td>
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