<table>
<thead>
<tr>
<th>Course Title</th>
<th>Design and Manufacturing</th>
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<tbody>
<tr>
<td>Course Code</td>
<td>MME 347</td>
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<tr>
<td>Course Type</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Level</td>
<td>Undergraduate</td>
</tr>
<tr>
<td>Year / Semester</td>
<td>3rd Year / 5th semester</td>
</tr>
<tr>
<td>Teacher’s Name</td>
<td>Denis Politis</td>
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<tr>
<td>ECTS</td>
<td>6</td>
</tr>
<tr>
<td>Lectures / week</td>
<td>3+1 hours</td>
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<tr>
<td>Laboratories / week</td>
<td>1 hour</td>
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**Course Purpose and Objectives**

Provide an overview of design methods and manufacturing techniques to understand how things are made.

**Learning Outcomes**

- Familiarity with computational design methods
- Description and modelling of manufacturing processes
- Understanding of machining and shaping processes
- Knowledge of rapid prototyping and surface patterning processes
- Description and modelling of integration, metrology, automation and robotics methods
- Familiarity with methods above in the laboratory and practice

**Prerequisites**

<table>
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<tr>
<th>Prerequisites</th>
<th>MME 145</th>
<th>Required</th>
<th>None</th>
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**Course Content**

Introduction to modern Computer-aided Design and Manufacturing Technology, with emphasis on geometrical aspects (material aspects are covered in MME 348). Design by CAD, representation of 2D/3D lines, surfaces and objects, geometric processing by homogeneous transformations. Rapid prototyping with material deposition - technologies, systems and applications. Machining processes, material removal, non-traditional technologies, manufacturing by CAM. Shaping by deformation/flow of foil and bulk material, CAE analysis. Surface patterning by lithography, coating and etching, micro- and nanotechnology. Metrology, microscopy, scanning and machine vision, instruments and image processing. Tolerances, fits, surface quality and defects. Assembly and transportation with automation, robotics and navigation systems. Applications of design and manufacturing systems.

**Laboratory Exercises**

- Metrology
- Screws and thread-generating processes
- Manual turning exercises and project (spinning top competition)

**Teaching Methodology**

- Lectures
- Tutorials
- Laboratory demos and projects in machining shop
- Educational field trips to local industries
- Communicative, Collaborative
During the first week of the semester, the Syllabus of the course is given by the teacher, which includes information on the course content, expected learning outcomes, assessment and office hours.

### Bibliography

### Assessment
- Homework & Labs 30%
- Midterm Exam 30%
- Final Exam 40%

### Language
Greek