ENGS102P Design and Professional Skills

Aims

To be successful engineers, our students need to be able to identify and analyse problems, conceive and design potential solutions, liaise with and present to clients, and work with and direct colleagues. They need to do these things efficiently, ethically, professionally, and competently, and, often, they need to do them quickly. Although it is possible to learn these skills ‘by osmosis’, this can take years—even decades—of trial and error. Our goal is to provide the students with tools at the start of their degrees that will make them more effective during their university career and, crucially, enable them to work as competent professionals not just when they graduate, but when they do projects and internships.

Intended Learning Outcomes

Upon completion of this module students should be able to:

• Outline the basic elements of the design cycle and be able to use these to begin to tackle real engineering problems;
• Give examples of ethical and sustainability issues related to engineering and be able to analyze future problems as they arise;
• Describe an engineering problem and its constraints in a concise written or spoken report;
• Understand and use basic concepts of teamwork and leadership and be able to scaffold effective work in teams;
• Have understanding of several tools for critical and creative thinking and use these to tackle real problems, whether engineering or otherwise;
• Identify and describe the utility of important structural features in writing and presentation (such as introductions, conclusions, and topic sentences), use these effectively, and evaluate their use in others’ work;
• Analyze the audience for a given communication (report or talk) and determine the appropriate point of view, level of detail, and jargon;
• Understand the source and meaning of technical diagrams, and to be able to create simple pictures and visualizations to assist in brainstorming, explanation, and design;
• Describe basic concepts in entrepreneurship, and recall the facilities available to them to develop their abilities in this area;
• Recognize the level of conduct expected of them by the body governing their profession, and understand why such codes of conduct are necessary;

Syllabus

• Introduction to Engineering/Course/Time Management
- Team working
- Design Cycle (3 classes)
- Creative thinking and ideation
- Critical thinking and information sources
- Ethics
- Professional conduct
- Introduction to Engineering Drawing
- Entrepreneurship
- Leadership
- Technical argument
- Presentation/Visualization
- Writing
- Matlab (5 classes)

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>None</th>
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<tbody>
<tr>
<td>Core for</td>
<td>All</td>
</tr>
<tr>
<td>Taught by</td>
<td>Sunny Bains, Tony Kenyon, Sally Day</td>
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<tr>
<td>Assessment</td>
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<tr>
<td>Weighting</td>
<td>40% Practical Assessment 60% Coursework</td>
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<tr>
<td>Coursework</td>
<td>Online Quizzes, E-mail, Video, Technical Reports, Presentation, Practical Assessment.</td>
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