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| **Unit Title** | Mechanical Principles (Route Specific Unit) |
| **Level** | 4 |
| **Reference No.*****(showing level)*** | EEC\_4\_976 |
| **Credit Value** | 30 CAT points |
| **Student Study Hours** | Total learning hours: 300 hoursContact hours up to 100 hoursStudent managed learning hours: 200 hours or more |
| **Pre-requisite learning** | None |
| **Co-requisites** | None |
| **Excluded combinations** | None |
| **Unit co-ordinator** | To be advised |
| **Faculty/Department** | ESBE / Engineering & Design |
| **Short Description** | This unit provides a more in depth investigation of the principles covered in Engineering Principles and Design and Practice which are essential to mechanical and mechatronics engineering. Particular attention will be paid to Thermofluids, Applied Mechanics and Engineering Materials |
| **Aims** | To develop the following:* Principles of fluid mechanics, heat transfer and thermodynamics.
* Introduction to the fundamental concepts and basic laws of solid mechanics
* Underlying principles of materials (internal structure, properties and industrial processes) and their application in engineering
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| **Learning Outcomes** | By the end of the unit the student should be able to:**Knowledge and Understanding**1. Describe the structure of the main classes of materials and how their properties relate to performance and manufacturing processes
2. Apply the Laws of Thermodynamics to problems of fluid states
3. Describe convection, conduction and radiation
4. Recognise the need for rigid body or deformable body analysis
5. Determine the stress and strain in a body under varying environmental conditions

**Intellectual Skills**1. Work with technical uncertainty

**Practical Skills**1. Understand the characteristics of particular laboratory equipment and processes

**Transferable Skills** 1. Use numerical and analytical skills to solve problems in physical systems in a systematic manner
2. Apply computing and quantitative skills for the analysis and presentation of complex data
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| **Teaching and learning pattern** | TBC |
| **Indicative content** | Detailed content of this unit will be developed once that of *Engineering Principles* and *Design and Practice* has been confirmed |
| **Assessment*****Elements & weightings*** | TBC |
| **Indicative Sources*****(Reading lists)*** | TBC |