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| **Unit Title** | Thermofluids and Turbomachinery |
| **Level** | 6 |
| **Reference No.****(showing level)** | EEA\_6\_114 |
| **Credit Value** | 15 CAT points |
| **Student Study Hours** | Contact hours: 52 Student-managed learning hours: 98 |
| **Pre-requisite learning** | Thermofluids |
| **Co-requisites** | None |
| **Excluded combinations** | None |
| **Unit co-ordinator** | Dr Sandeep Ahuja |
| **Faculty/Department** | ESBE / Engineering & Design |
| **Short Description** | This unit expands student’s knowledge in the broad area of thermofluids and heat and mass transfer.  |
| **Aims** | 1. To increase the student’s understanding of thermodynamics through study of internal combustion engines and air-standard cycles2. To increase the student’s understanding of heat and mass transfer through study of heat exchangers, boiling, condensation and Fick’s law of diffusion.3. To increase the student’s understanding of fluid mechanics through study of the Navier Stokes equation, Euler’s equation, and rotordynamic machines- e.g. pumps, fans and turbines.4. To improve the student’s analytical skills |
| **Learning Outcomes** | **Knowledge and Understanding**Upon successful completion of this unit students will be able to:1. Analyse and solve problems associated with internal combustion engines and turbomachinery, for example, compressors, turbines and fans.2. Analyse the performance of heat transfer equipment such as heat exchangers, condensers, evaporators, etc.3. Differentiate between the analytical approaches to compressible and incompressible flows and the role of the Navier Stokes equations in investigating the relationships between parameters in such flows. **Intellectual Skills**Students will develop the following key intellectual skills:1. Problem solving2. Analysis and data evaluation**Practical Skills**Students will develop practical skills such as:1. Use of library, internet and other sources for collection of information**Transferable Skills**Students will develop transferable skills such as:1. Apply mathematical skills2. Solve problems |
| **Teaching and learning pattern** | Formal lectures, tutorials and demonstrations supported by handouts tutorial sheets and a dedicated module site on Blackboard for additional materials. Audio visual aids, case studies, group discussion seminars and the use laboratory experiments |
| **Indicative content** | 1. Otto and Diesel Air standard cycle
2. Internal Combustion Engines
3. Heat Exchangers
4. Boiling and condensation
5. Governing equations of fluid dynamics
6. Turbomachinery
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| **Assessment****Elements & weightings** | This unit is assessed as follows:- Examination: 70%- Assignment: 30% |
| **Indicative Sources****(Reading lists)** | TBC |