|  |  |
| --- | --- |
| **Module code** | TM-4306 |
| **Module Title** | Design of Machine Elements |
| **Degree/Diploma** | Bachelor of Engineering (Manufacturing Systems) |
| **Type of Module** | Major Option |
| **Modular Credits** | 4 | **Total student Workload** | 8 hours/week |
| **Contact hours** | 4 hours/week |
| **Prerequisite** | TM-3302 |
| **Anti-requisite** | None |
| **Aims**The module enables the students to choose the suitable materials with suitable dimensions for machine components and analyse the components under acting loads. Students are required to learn how to design a system to apply the learnt ideas for the assembly of a machine and to design machine systems with definitive components and their arrangement. Students are required to use computers and available software in the design and analysis of machine components.  |
| **Learning Outcomes***On successful completion of this module, a student will be expected to be able to*: |
| Lower order: | 30% | * Identify different types of loads and stresses.
* Understand design of shafts, keys, coupling, gears, belts, pulleys, pressure vessels.
* Understand design of bolts, rivets, and welded joints.
* Understand design of springs and bearings.
 |
| Middle order:  | 30% | * Analyze stresses on different machine elements.
* Solve the problems regarding the failure of machine elements.
* Think creatively towards element design.
 |
| Higher order: | 40% | * Design the different machine elements from stress point of view.
* Test the safety of machine element before failure.
* Design the machine systems.
 |
| **Module Contents*** Design Methodology, Synthesis, Creativity and Conceptualization.
* Failure Theories
* Shaft design based on strength and rigidity.
* Design of Screws and Fasteners.
* Welding, Bonding and Design of Permanent Fasteners
* Bearings Selection.
* Design of Gears
* Belt Drive Design
* Design of Chains and Rope Drives
 |
| **Assessment** | Formative assessment | Monthly online MCQ tests will be used to test and to give feedback for their learning |
| Summative assessment | Examination: 40% |
| Coursework: 60%- 2 class tests (15% each)- 2 Assignments (10%)- 1 group project (10%) |