

## MEC 3203: Product Design and Development

Hours per semester				Weighted total mark	Weighted exam mark	Weighted continuous assessment mark	Credit unit
LH	PH	TH	CH				CU
60	00	60	60	100	60	40	4

### Brief Description of Course:

#### *Requirement*

Course work Final examination **Total**

This course introduces the concepts and techniques employed in the design and development of products. It covers design basics, methods, approaches and tools. It involves students working in groups to go through the process of designing a product.

### Objectives of the Course:

The objectives of this course are:

- To give a broad introduction theory and application of design principles to any new product development
- Familiarize the students with the concepts, techniques, tools, general approach to a design problem.
- To obtain an understanding of the relationship between materials selection and designing for optimum performance.
- Equip students with the skills required to produce documentation pertaining to a product design
- To enable students appreciate the use of computer technologies in product design.

### Expected Outcomes:

At the end of this course, a student should be able:

- Describe the basic concepts of design
- Explain the various approaches to selecting the characteristics of a design
- Demonstrate the ability to work as a group and work from societal need to a product design

**(2 Hours)**

**(4 Hours)**

(4 Hours)

(2 Hours)

(2 Hours) (2 Hours)

(4 hours)

(2 Hours)

(4 hours)

- Produce documentation pertaining to a product design

#### **Course Content:**

##### **Introduction**

- Definition of terms
- Basics, who designs, who develops, innovations. **Product development processes/design process**
- Concept generation and selection
- Design in the context of engineering **Design methods**

##### **Concurrent engineering**

##### **Product architecture Quality engineering**

##### **Modeling and simulation**

##### **Integrated design for optimization**

##### **Materials selection, material processing in design**

- Design for manufacture
- Design for assembly
- Prototype production

## **Product development costing**

### **Group Design project (90 Hours)**

#### **Delivery Methods:**

The course will be taught by using lectures and tutorials **Assessment Methods:**

Course work (assignments and tests) and final examination and their relative contributions to final grade are shown as follows:

#### **Requirement Percentage contribution**

Course work 40%

Final examination 60%

**Total 100%**

#### **References**

- Product Design and Development. Karl T. Ulrich & Steven D. Eppinger. Publisher McGraw-Hill Higher Education, ISBN 0-07-229647-X (2000)
- Design Methods in Engineering and Product Design. Ian Wright. Publisher, McGraw- Hill Education-Europe ISBN 0077093763 (1997)
- Product Design. Kevin Otto & Kristini Wood. Publisher, Printice Hall ISBN 0130212717 (2000)
- Mechanical Assemblies: their design, manufacture and role of Product design. Daniel E. Whitney. Publisher Oxford University Press. ISBN 0195157826 (2004)
- Different Website sources

