UNIVERSITI TEKNOLOGI MARA

IDE461: WORKSHOP TECHNOLOGY

Course Name (English)	WORKSHOP TECHNOLOGY APPROVED
Course Code	IDE461
MQF Credit	3
Course Description	The course is designed to expose and explain the knowledge of manufacturing practices for all designers in familiarizing themselves with modern concepts of manufacturing technologies. The basic need is to provide theoretical and practical knowledge of manufacturing processes and workshop technology to all the design students. Manufacturing and workshop practices have been become important in the industrial design environment to produce products for the service of mankind. This course deals with the knowledge and understanding of basic elements and principles of workshop technology where emphasis is given to problem solving and practical exercises.
Transferable Skills	Student will able to follows the rule in workshop, know the safety guide in workshop and handling machine safely.
Teaching Methodologies	Lectures, Studio, Demonstrations, Practical Classes, Tutorial, Simulation Activity, Workshop, Supervision
CLO	CLO1 Describe and perform general rule and safety procedures during workshop practice CLO2 Identify the suitable techniques with proper hand tools and power tools for model making process CLO3 Demonstrate and competent in handling variable types of materials, tools and machineries
Pre-Requisite Courses	No course recommendations

Topics
1. INTRODUCTION WORKSHOP TECHNOLOGY & SAFETY 1.1) WORKSHOP SAFETY AND HEALTH MANAGEMENT 1.2) • General Safety 1.3) • Housekeeping
2. INTRODUCTION TO HAND TOOLS 2.1) • Measuring & marking 2.2) • Sawing 2.3) • Chopping 2.4) • Clamping 2.5) • Workshop materials
3. INTRODUCTION TO POWER TOOLS 3.1) • Power drills and driver 3.2) • Portable power saws and jointers 3.3) • Planner and routers 3.4) • Sanders Automatic pin drivers
4. INTRODUCTION TO MACHINERIES 4.1) • General machineries safety 4.2) • Planner, shaper and slotter 4.3) • Drilling machine and milling machine 4.4) • Grinding, broaching, boring and jig boring 4.5) • Automatic Lathes, Jigs and fixture 4.6) 4.7) MATERIAL CUTTING 4.8) • Wood 4.9) • Metal

4.10) • Plastic
4.11) • Composite
4.12) Assignment 1- Material Cutting
4.13) Study on the basic cutting techniques, tools and materials to understand the process of the model making that using wood, metal, plastic and composite as a medium. (15%)

5. INTRODUCTION TO JOINTING & FIXING
5.1) • Jointing (wood)
5.2) • Halving Joint
5.3) • Lap joint
5.4) • Mortice & Tenon joint
5.5) • Housing Joint
5.6) • Edge Joint
5.7) • Dovetail Joint
5.8) • Mitre Joint
5.9) • Dowel Joint
5.10) • Domino Jointing
5.11) Assignment 2- Material & Jointing
5.12) Study on the basic jointing and fixing techniques, tools and materials to understand the process of the model making that using wood and metal as a medium.
5.13) (15%)

6. INTRODUCTION TO AUTOMOTIVE MODEL MAKING CONSTRUCTION
6.1) • Vehicle Ontology – Basic Line
6.2) • Base platform
6.3) • Wheelbase

7. INTRODUCTION TO ALTERNATIVE CONSTRUCTIONS
7.1) • Metal - welding
7.2) • Material Construction
7.3) • Plastic – vacuuming forming
7.4) Assignment 3- Alternative Constructions
7.5) Study on the basic technique for welding and to understand the process of model making that using plastic etc.
7.6) (15%)

8. MODEL MAKING AUTOMOTIVE CONSTRUCTION
8.1) • Model making process.
8.2) • Form shaping

9. FINISHING & MATERIAL
9.1) • Finishing preparation
9.2) • Staining
9.3) • Upholstery
9.4) • Veneers
9.5) • Final painting
9.6) Assignment 4-Primer & Coating
9.7) Study on the basic technique, tool and material to understand the process of the furniture model making finishing.
9.8) (15%)

10. AUTOMOTIVE FINISHING & DETAILING
10.1) • Finishing preparation
10.2) • Detailing and lining

11. SUBMISSION OF FINAL PROJECT WORK
11.1) Project construction based on workshop material and lesson techniques :
11.2)
11.3) Final Transport Models (20%)
11.4)
11.5) Final Furniture Models (20%)

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Assignment 1 (Material Cutting) - Study on the basic technique, tool and material to understand the process of the model making that using wood, metal, plastic and composite as a medium.	15%	CLO1
Assignment	Assignment 2 (Material Jointings) - Study on the basic technique, tool and material to understand the process of the model making that using wood and metal as a medium.	15%	CLO2
Assignment	Assignment 3 (Material Constructions) - Study on the basic technique, tool and material to understand the process of the model making that using plastic and composite as a medium.	15%	CLO2
Assignment	Assignment 4 (Primer & Coating) - Study on the basic technique, tool and material to understand the process of the model making that using metal as a medium.	15%	CLO2
Final Project	Furniture final prototype	20%	CLO3
Final Project	Transport final prototype	20%	CLO3

Reading List

Reference Book Resources

- **Larry Jeffus 2012, *Welding and Metal Fabrication*, Delmar, Clifton Park**
- **Rajender Singh 2006, *Introduction To Basic Manufacturing Processes*, New Age International (P) Ltd., Publishers**
- **Albert Jackson, David Day & Simon Jennings 2006, *The Complete Manual Of Woodworking*, Alfred A. Knopf, Inc.**
- **Rob Thompson 2009, *Manufacturing Processes For Design Profession*, Thames & Hudson Ltd, 181A**
- **Jim Lesko 2008, *Industrial Design Materials and Manufacturing*, John Wiley & Sons, Inc., Hoboken**
- **A.K. Chitale and R.C. Gupta 2008, *Product Design And Manufacturing*, Prentice-Hall of India Private Limited**
- **Hudson, J 2011, *Process: 50 Product Design From Concept to Ma*, Laurence King Ltd.**
- **Retrieve Boucharenc, C. 2013, *A Design and Innovation Consulting Firm*, National University of Singapore.**
- **Yoshiharu Shimizu 1991, *Models & Prototypes*, Graphi-sha Publishing Co.,Ltd. Kudan-kita**
- **James Garratt 1995, *Design And Technology*, Cambridge University Press**

Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources