

### Academic Course Description

BHARATH UNIVERSITY  
 Faculty of Engineering and Technology  
 Department of Mechanical Engineering  
**BME 5L2- MANUFACTURING TECHNOLOGY LAB - II**  
 Fifth Semester, 2015-16 (Odd Semester)

#### Course (catalog) description

To expose students in understanding various metal cutting operations and commonly used machine tools.

**Compulsory/Elective course : Compulsory**

Credit hours : 2

Course Coordinator : **Mr. R. J. Golden Renjith Nimal**

**Instructors :**

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Mr. R. J. Golden Renjith Nimal	3 <sup>rd</sup> Year Mech, Sec 'B'	Machine Shop	9994351938	goldenrenjith.mech@bharathuniv.ac.in	9.50 to 12.30 pm
Mr. V. P. Durairaj	3 <sup>rd</sup> Year Mech, Sec 'C'	Machine Shop	9884906033	durairaj.mech@bharathuniv.ac.in	1.30 to 4.00 pm
Mr. R. Hariharan	3 <sup>rd</sup> Year Mech, Sec 'A'	Machine Shop	9884910167	hariharan.mech@bharathuniv.ac.in	9.50 to 12.30 pm
Mr. Arun V. Rejus Kumar	3 <sup>rd</sup> Year Mech, Sec 'E'	Machine Shop	9789492493	arunrejus.mech@bharathuniv.ac.in	1.30 to 4.00 pm
Mr. S. Thirumavalavan	3 <sup>rd</sup> Year Mech, Sec 'D'	Machine Shop	9445429318	thirumavalavan.mech@bharathuniv.ac.in	1.30 to 4.00 pm

#### Relationship to other courses:

Pre –requisites : Manufacturing Technology

Assumed knowledge : To expose students in understanding various metal cutting operations and commonly used machine tools.

Following courses : Nil

## Syllabus Contents

### LIST OF EXPERIMENTS:

1. Shaper Exercise : Making a square from a round rod
2. Exercise on dovetail cutting
3. Exercise on Plane milling.
4. Exercise on Spur Gear Milling
5. Exercise on Helical Gear Milling
6. Grinding a single point cutting tool in tool and cutter grinder.
7. Slotting and key way cutting in vertical slotting machine.
8. Determination of cutting forces in Milling and drilling using dynamometers.

### Computer usage: Nil

### Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

### Broad area: Engineering

### Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 2 <sup>nd</sup> week	Session 1 to 14	2 Periods
2	Cycle Test-2	September 2 <sup>nd</sup> week	Session 15 to 28	2 Periods
3	Model Test	October 3 <sup>rd</sup> week	Session 1 to 45	3 Hrs
4	University Examination	November	All sessions / Units	3 Hrs.

## Mapping of Instructional Objectives with Program Outcome

To expose students in understanding various metal cutting operations and commonly used machine tools.	Correlates to program outcome		
	H	M	L
1. Upon completion of this course, the students can able to understand and compare the functions and applications of different metal cutting tools	a		
2. Learn operations in metal cutting processes.	b		
3. To demonstrate the programming in CNC machining	i		
4. Upon completion of this course, the students can able to apply the different metal removing ,finishing and super finishing and for component production			j
5. Learn various cutting tool operations using CNC machines.		d	k
6. Upon completion of this course, the students can able to understand		g	l

H: high correlation, M: medium correlation, L: low correlation

### Draft Lecture Schedule

S.NO	Topics	Problem solving (Yes/No)
1.	Shaper Exercise : Making a square from a round rod	No
2.	Exercise on dovetail cutting	No
3.	Exercise on Plane milling	No
4.	Exercise on Spur Gear Milling	No
5.	Exercise on Helical Gear Milling	No
6.	Grinding a single point cutting tool in tool and cutter grinder	No
7.	Slotting and key way cutting in vertical slotting machine	No
8.	Determination of cutting forces in Milling and drilling using dynamometers	No

## Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

## Evaluation Strategies

Cycle Test – I	-	10%
Cycle Test – II	-	10%
Model Test	-	25%
Attendance	-	5%
Final exam	-	50%

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**Prepared by Mr. R. J. Golden Renjith Nimal**  
**Addendum**

### **ABET Outcomes expected of graduates of B.Tech / MECH / program by the time that they graduate:**

- a) The ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) The ability to identify, formulate and solve engineering problems.
- c) The ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) The ability to design and conduct experiments, as well as to analyze and interpret data
- e) The ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) The ability to apply reasoning informed by the knowledge of contemporary issues.
- g) The ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) The ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) The ability to function on multidisciplinary teams.
- j) The ability to communicate effectively with the engineering community and with society at large.
- k) The ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) The ability to recognize the need for, and an ability to engage in life-long learning.

## **Program Educational Objectives**

### **PEO1: PREPARATION:**

Mechanical Engineering graduates are enthusiastic to provide strong foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve engineering problems in the field of Mechanical Engineering.

### **PEO2: CORE COMPETENCE:**

Mechanical Engineering graduates have competence to enhance the skills and experience in defining problems in the field of Mechanical Engineering and Technology design and implement, analyzing the experimental evaluations, and finally making appropriate decisions.

### **PEO3: PROFESSIONALISM:**

Mechanical Engineering graduates made competence to enhance their skills and embrace new thrust areas through self-directed professional development and post-graduate training or education.

### **PEO4: PROFICIENCY:**

Mechanical Engineering graduates became skilled to afford training for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

### **PEO5: ETHICS:**

Mechanical Engineering graduates are morally merged to apply the ethical and social aspects of modern Engineering and Technology innovations to the design, development, and usage of new products, machines, gadgets, devices, etc.

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<b>Course Teacher</b>	<b>Signature</b>
Mr. R. J. Golden Renjith Nimal	
Mr. V. P. Durairaj Mr. R. Hariharan	
Mr. Arun V. Rejus Kumar Mr. S. Thirumavalavan	

**Course Coordinator**  
Mr. R. J. Golden  
Renjith Nimal

**HOD/MECH**