

**Faculty of Engineering & Technology**

**Production Engineering 1**

**Information :**

**Course Code :** MAN 221

**Level :** Undergraduate

**Course Hours :** 2.00- Hours

**Department :** Department of Petroleum Engineering

**Instructor Information :**

Title	Name	Office hours
Professor	Maher Mohamed Aboelhassan Nofal	1
Lecturer	SAMAH ELSAYED ELMETWALLY ELKHATIB	7
Teaching Assistant	Mostafa Hesham Mahmoud Naim	
Teaching Assistant	Ahmed Ibrahim Sadek Mostafa Elgindy	

**Area Of Study :**

Prepare students to get a basic idea of machining processes, Cutting elements, cutting with single edge cutting tools, Cutting tool materials and its characteristics.

Programme(s) on which the course is given: B.Sc. in Petroleum Engineering

Major or minor element of programmes: (Not Applicable)

Department offering the programme: Petroleum Engineering

Department offering the course: Petroleum Engineering

Academic year/Level: Level Two

Date of specification approval: September 2019

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Develop the students' knowledge about the different machining operations and different Cutting tools for turning, shaping, drilling, Cutting with multi-edge, milling, grinding operation

Prepare students to calculate Machining time allowances, Machining Cost and Machining elements cost and Determination Break-even point.

**Description :**

Introduction to machining processes, Cutting elements, Cutting with single edge cutting tools, Cutting tool materials and its characteristics, Cutting velocity and feed, Machining time, Power consumption in cutting, Practical machining operations: turning, shaping, drilling, Cutting with multi-edge, Cutting tools: milling, grinding, lapping, Simple dividing and dividing head, Basic elements of machine tools and specifications, Work fixation, Tool fixation, Process sheet, Machining time allowances, Cost elements, Breakeven point.

**Course outcomes :**

**a. Knowledge and Understanding: :**

1 -	Explain the different tool angles for single point cutting tool
2 -	Generalize the different motions occur while machining in all machining operation

3 -	distinguish the differences between all common machining processes (turning, milling, shaping, planning and grinding)
4 -	identify a basic idea of machining process and fundamental of metal cutting
<b>b. Intellectual Skills: :</b>	
1 -	Apply mathematical calculations to define relations control chip geometry in turning and milling operations
2 -	Calculate the force analysis of metal cutting process in orthogonal cutting condition
3 -	Determine machining parameters to get the estimate of machining time and tool life
4 -	Modify machining parameters to find the best cutting speed to reach min machining cost or min machine time
<b>c. Professional and Practical Skills: :</b>	
1 -	Classify all cutting forces in orthogonal cutting conditions
2 -	Perform mathematical calculations to estimate the required power to machining certain material under given cutting conditions in orthogonal cutting
3 -	Analyse the sources affecting tool life and wear mechanisms
<b>d. General and Transferable Skills: :</b>	
1 -	Communicate effectively.
2 -	Effectively manage tasks, time, and resources.
3 -	Acquire entrepreneurial skills.

### **Course Topic And Contents :**

<b>Topic</b>	<b>No. of hours</b>	<b>Lecture</b>	<b>Tutorial / Practical</b>
Introduction to Machining Operations	6	4	2
Fundamentals of Machining	3	2	1
Cutting Elements, Cutting With single Edge Cutting Tools, Chip Formation, Mechanics of Cutting and Power Consumption	5	4	1
Cutting-Tools: Materials and Characteristics and Tool Wear	6	4	2
Cutting Fluids	3	2	1
Machining Processes: Turing, Shaping and Hole Making	9	6	3
Machining Processes: Milling, Broaching, Sawing, Filling, and Gear Manufacturing	6	4	2
Machining Time, and Machining Economics Break-even point	6	4	2

### **Teaching And Learning Methodologies :**

Interactive Lecture
Discussion
Problem-based Learning
Report
Experiential learning

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	5.00		
Final Exam	40.00		
Lab Exper.	5.00		
Mid- Exam I	20.00		
Mid- Exam II	20.00		
Quizzes	5.00		

**Recommended books :**

- Journal of Metals, ASM, USA
- Websites on machining operation and machining economies