TEACHING PLAN: ADVANCED MANUFACTURING PROCESSES B.Tech. 8th SEM.

SCHOOL: SOET		ACADEMIC SESSION 2022-23	FOR STUDENTS' BATCH: 2019-2023
1	Course code	PEC – ME- 409	
2	Course Title	ADVANCED MANUFACTURING PROCESSES.	
3	Credits	3	
4	Learning Hours	Contact Hours: 3 Practical Teaching: 0 Project, Tutorial and Assessment: 0 Total hours: 3	
5	Course Objective	I. Understand the need and importance of advanced manufacturing process and selection of process. II. Gain the knowledge to Ultrasonic machining and abrasive water jet machining. III. Gain the knowledge to remove material by chemical and thermal machining. IV. Gain the knowledge to advance casting processes and advance welding processes. V. Gain the knowledge to advance metal forming processes.	
6	Course Outcomes	1. Compare advanced manufacturing machining, classification, material applications in material removal process, the principle and processes of ultrasonic machining and abrasive jet machining 2. Understand the principle, working and applications of chemical and thermal metal removal processes. 3. Identify the principle, working and applications of advanced casting processes. 4. Understanding the principle, working and applications of advanced welding processes. 5. Understand the principles, working and applications of metal forming process.	
7	Outline syllabus:		

7.01	Paper Code	Unit	Introduction	Reference number	Teaching methods
7.02	PEC – ME-409	I	ADVANCE MECHANICAL MACHINING PROCESSES: Classification of AMPs-process selection; Ultrasonic machining; machining setup; mechanics of cutting; parameter analysis; process capability; application. Abrasive water jet machining	Manufacturing Science by ghosh and mallik.	PPT, Seminar, Chalk & Talk
7.03		II	ADVANCE CHEMICAL AND THERMAL MACHINING PROCESSES: Electrochemical machining; electrochemical grinding; electrochemical honing; chemical machining; electric discharge machining; wire cut EDM; electron beam machining; laser beam machining.	Manufacturing Science by ghosh and mallik.	PPT, Seminar, Chalk & Talk
7.04		III	ADVANCE CASTING PROCESSES: Metal mold casting: low and high pressure; continuous casting; squeeze casting; vacuum mold casting; evaporative pattern casting; chemical shell casting	Manufacturing Science by ghosh and mallik.	PPT, Seminar, Chalk & Talk

7.05		IV	ADVANCE WELDING PROCESSES: Electron beam welding; laser beam welding; ultrasonic welding	Manufacturing Science by ghosh and mallik.	PPT, Seminar, Chalk & Talk
		V	ADVANCE METAL FORMING PROCESSES: High rate energy forming(HERF) processes; electromagnetic forming; explosive forming; electro-hydraulic forming; stretch forming; contour roll forming.	Manufacturing Science by ghosh and mallik.	PPT, Seminar, Chalk & Talk

8	**Course Evaluation**	
8.10	**CA: 20%**	
8.1	**Attendance**	5%
8.12	**Homework**	-
8.13	**Quizzes**	4 Quizzes, 5%
8.14	**Projects**	1 Project, 5%
8.15	**Presentation**	1 Presentation, 5%
8.16	**Any other**	--
8.2	**MTE(IA)**	20%
8.3	**End-term examination: 60%**	
9	**Text Books & References**	
9.1	**Text books**	1. Manufacturing Engineering & Technology, 7th Edition Serope Kalpakjian, Illinois Institute of Technology Steven Schmid, The University of Notre Dame ©2014 |Pearson 2. Nontraditional Manufacturing Processes Gary F. Benedict CRC Press
9.2	**References**	1. Manufacturing Science by ghosh and mallik ; Prentice hall of India, 8th Edition 2. Pandey P. C., Shah H.S., "Modern Machining Processes", Tata McGraw-Hill, 1st Edition, 2013. 3. K. Jain, "Advanced Machining Processes", Allied Publishers, 1st Edition, 2013. 4. C. Elanchezhian, B. Vijaya Ramnath, M. Vijayan, "Unconventional Machining processes", Anuradha Publication, 1st Edition, 2005. 5. M. K. Singh, "Unconventional Machining processes", New Age International Publishers, 1st Edition, 2010. 6. https://books.google.co.in/books/about/Advanced_Machining_Processes.html?id=duBqhj2OlfAC 7. https://books.google.co.in/books/about/Modern_Machining_Processes.html?id=uC3rHzhogmMC 8. http://nptel.ac.in/courses/112105126/36
9.3	**Video References**	1. https://www.youtube.com/watch?v=dmHv42wda9k 2. https://www.youtube.com/watch?v=5w6szZtOg5w 3. https://www.youtube.com/watch?v=b1nX7WVIN7U 4. https://www.youtube.com/watch?v=2O1TyJGXuWY 5. https://www.youtube.com/watch?v=C0unJVx16Nk 6. https://www.youtube.com/watch?v=xYi2x0o--34 7. https://www.youtube.com/watch?v=GEexf3Fmz9k

Mapping of COs & POs

Course Outcome	Program Outcome												PSO			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
CO1	3	3	3	_	_	2	_	_	2	1	1	2	3	3	2	2
CO2	3	3	3	-	-	2	-	-	2	1	1	2	3	3	2	2
CO3	3	3	3	-	-	2	-	-	2	1	1	3	3	3	2	2
CO4	3	3	3	-	-	2	-	-	2	1	1	2	3	3	2	2
CO 5	3	3	3	-	-	2	-	-	2	1	1	2	3	3	2	2

QUESTION BANK

UNIT I

1. What are the characteristics of unconventional machining process?
2. List four advantages of AJM process?.
3. List the unique benefits offered by WJM process?
4. Explain the classification of Unconventional machining according to major energy source employed?
5. What is meant by advanced Machining Processes?

UNIT II

1. What are the advantages and disadvantages of Laser beam machining?
2. With a neat sketch explain Electro-chemical Machining process (ECM).
3. What is chemical machining? Explain briefly the elements of the process.
4. With a neat sketch explain laser beam machining, generation of laser, equipment and mechanism of metal removal.
5. Explain the mechanism of Metal removal in EDM process.

UNIT III

1. Explain continuous casting.
2. With a neat sketch explain chemical shell casting.
3. Explain squeeze casting.
4. Discuss different types of metal molding process.
5. What is the importance of vacuum mold casting? Explain.

UNIT IV

1. Discuss different types of advanced welding technologies.
2. Explain the ultrasonic welding with the diagram.
3. Compare Electron beam welding and laser beam welding.
4. What is Electron beam welding? Explain.
5. List out the equipments used in ultrasonic welding and explain their function in the welding process.

UNIT V

1. Explain the explosive forming.
2. What is High rate energy forming? Explain.
3. With neat sketch explain stretch forming process.
4. Write short notes on contour roll forming.
5. Describe electro-hydraulic forming