

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.

COURSE OUTLINE TEMPLATE			
Course Title	SURFACE ENGINEERING		
Course Code	MT 617	No. of Credits	3
Department	MME	Faculty	Prof. S.NATARAJAN
Pre-requisites Course Code			
Course Coordinator(s) (if, applicable)			
Other Course Teacher(s)/Tutor(s) E-mail	sn@nitt.edu	Telephone No.	9486001136
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
COURSE OVERVIEW			
Introduction about the concepts of Surface Engineering and develop expertise on how to apply the concepts in practical scenarios.			
COURSE OBJECTIVES			
To analyse the various concepts of surface engineering and comprehend the design difficulties.			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes(PO)		
Upon successful completion of this course, the student will be able to understand 1. Define different forms of processing techniques of surface engineering materials 2. Know the types of Pre-treatment methods to be given to surface engineering 3. Select the Type of Deposition and Spraying technique with respect to the application 4. Study of surface degradation of materials 5. Asses the surface testing methods and Comprehend the degradation properties	1 & 2 1, 2 & 9 3 & 5 9 & 10 11		

COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	1 st , 2 nd week	Introduction tribology, surface degradation, wear and corrosion, types of wear, roles of friction and lubrication, overview of different forms of corrosion	Chalk talk and PPT presentations
2	3 rd week	Numerical Problems Practice	Work out
3	4 th , 5 th week	Introduction to surface engineering, importance of substrate, Chemical and electrochemical polishing, significance, specific examples, chemical conversion coatings	Chalk talk and PPT presentations
4	6 th , 7 th week	Phosphating, chromating, chemical colouring, anodizing of aluminium alloys, thermochemical processes - industrial practices	Chalk talk and PPT presentations
5	8 th , 9 th week	Surface pre-treatment, deposition of copper, zinc, nickel and chromium - principles and practices, alloy plating, electrocomposite plating, electroless plating of copper, nickel-phosphorous, nickel-boron.	Chalk talk and PPT presentations
6	10 th , 11 th week	Electroless composite plating; application areas, properties, test standards (ASTM) for assessment of quality deposits, Definitions and concepts, physical vapour deposition (PVD), evaporation, sputtering, ion plating, plasma nitriding, process capabilities & Numerical Problems	Chalk talk and PPT presentations
7	12 th , 13 th week	Chemical vapour deposition (CVD), metal organic CVD, plasma assisted CVD, specific industrial applications, Thermal spraying, techniques, advanced spraying techniques	Chalk talk and PPT presentations

8	14 th , 15 th week	Plasma surfacing, D-Gun and high velocity oxy-fuel processes, laser surface alloying and cladding, specific industrial applications, tests for assessment of wear and corrosion behaviour.	Chalk talk and PPT presentations
9	16 th week	Final Examination	

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment I	8 th week	1 hour	20 %
2	Assessment II	12 th week	1 hour	20 %
3	Assignments			10 %
4	Final Exam	16 th week	3 hours	50 %

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

1. Sudarshan T S, 'Surface modification technologies - An Engineer's guide', Marcel Dekker, Newyork, 1989
2. Varghese C.D, 'Electroplating and Other Surface Treatments - A Practical Guide', TMH, 1993

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept
2. Feedback form issued to students to express their comments about the course before cycle test & after completing the syllabus. Students are requested to give feedback about the course.
3. Student knowledge about the subject covered will be judged through marks obtained in examination

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

1. Examination

- a) Students who have missed the first and second assessment or both can register the re-test examination which shall be conducted after the completion of second cycle test and before the final examination
- b) The re-test shall be conducted for 20 marks comprising the syllabus for both first and second cycle tests
- c) Students should submit assignments before last date of submission in case students fail to submit within the last date, he/she will get zero marks for the same

2. Attendance

- a) The minimum attendance for appearing for the final examination is 50 %
- b) Those students who are having attendance below 50 % should attend additional classes before appearing for final examination
- c) The institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessment of a course will be done on the basis of marks
- d) The passing mark should be $x/2$ or $X_{max}/3$ whichever is less where x is the mean of the class and X_{max} is the maximum mark in the class
- e) The letter grades and the corresponding grade points are as follows:

Letter	S	A	B	C	D	E	F
Grade	10	9	8	7	6	5	0

- 1. Students scoring less than minimum passing mark in the assessments defined in the course plan shall be deemed to have not successfully completed the course and be given an 'F' grade
- 2. Students awarded F grade may appear for re-examination
- 3. All students who earn a minimum of 5 grade points in a course is declared to have successfully completed the course
- 4. If the students fails to appear semester examination due to medical reason can register for special end semester examination after approval from course teacher and HoD. The special end semester examination will be conducted within ten days from reopening of institute for next semester. Students should register their names with course teacher to appear for special end semester examination within three days from reopening institute for next semester. Grade issued as per the guidelines followed for his/her batch students.

ADDITIONAL COURSE INFORMATION

FOR SENATE'S CONSIDERATION

Course Faculty

[Signature]

CC-Chairperson

[Signature]

HOD

[Signature]

06/09/2017

(Prof. S. NATARAJAN)
MME Dept.