



**NATIONAL NATIONAL INSTITUTE OF TECHNOLOGY,  
TIRUCHIRAPPALLI  
DEPARTMENT OF PRODUCTION ENGINEERING**

COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	M.Tech. MANUFACTURING TECHNOLOGY / M.S.(by Research) / Ph.D.		
<b>Course Title</b>	ADDITIVE MANUFACTURING		
<b>Course Code</b>	PR628	<b>No. of Credits</b>	3
<b>Course Code of Pre-requisite subject(s)</b>	-		
<b>Session</b>	July 2021	<b>Section (if, applicable)</b>	-
<b>Name of Faculty</b>	Dr. P. Senthil	<b>Department</b>	Production Engineering
<b>Email</b>	senthil@nitt.edu	<b>Telephone No.</b>	3513
<b>Name of Course Coordinator(s)</b>	-		
<b>E-mail</b>	-	<b>Telephone No.</b>	-
<b>Course Type</b>	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
<b>Syllabus (approved in BoS)</b>			
<p>Introduction- Need for the compression in product development, History of rapid prototyping (RP) systems, Survey of applications, Growth of RP industry, Classification of RP systems.</p> <p>Principle, process parameters, process details and applications of various RP processes - Stereo lithography systems, Laser Sintering, Fused Deposition Modeling, Laminated Object Manufacturing.</p> <p>Solid Ground Curing, Laser Engineered Net Shaping, 3D Printing, Laser Melting, Cladding.</p> <p>Rapid Tooling: Indirect rapid tooling Direct rapid tooling, soft tooling Vs hard tooling, Rapid Manufacturing Process Optimization- Factors influencing accuracy, data preparation errors, part building errors, errors in finishing, influence of part build orientation.</p> <p>Software for RP: STL files, overview of solid view, magics, mimics, magics communicator, etc., internet based softwares, collaboration tools.</p> <p>RP Technology selection, Decision Making, Life Cycle Assessment of RP processes, Sustainability issues.</p>			
<b>COURSE OBJECTIVES</b>			
<ul style="list-style-type: none"> <li>To understand the importance of time compression technologies</li> <li>To do selection of appropriate technology for the application</li> <li>To give exposure to RP software packages</li> </ul>			



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<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>			<b>Aligned Programme Outcomes (PO)</b>
1. Understand the importance of time compression technologies			PO1, PO 2, PO3, PO 4, PO 5, PO9, PO11
2. Selection of appropriate technology for the application			
3. Exposure to RP software packages			
<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<p>Additive manufacturing is a group of techniques used to quickly fabricate prototypes, functional parts and end use components using three-dimensional computer aided design (CAD) data. Fabrication of the parts or assembly is usually done using 3D printing or "additive manufacturing" technology. This can also be used for making tools which will reduce overall time for manufacturing.</p> <p>This course enables students to understand various additive manufacturing technologies and select suitable technology for different applications and to do life cycle assessment of additive manufacturing processes</p>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	Week 1	Introduction, Need for the compression in product development, History of RP systems	Online VC / PPT
2	Week 2	Survey of applications, Growth of RP industry, Classification of RP systems.	Online VC / PPT
3	Week 3	Principle, process parameters, process details and applications of Stereo lithography systems, Laser Sintering.	Online VC / PPT
4	Week 4	Fused Deposition Modeling, Laminated Object Manufacturing.	Online VC / PPT
5	Week 5	Solid Ground Curing, Laser Engineered Net Shaping	Online VC / PPT
6	Week 6	3D Printing, Laser Melting, Cladding	Online VC / PPT
Descriptive Assessment - 1			
7	Week 7	Rapid Tooling: Indirect rapid tooling	Online VC / PPT
8	Week 8	Direct rapid tooling , soft tooling Vs hard tooling	Online VC / PPT
9	Week 9	Rapid Manufacturing Process Optimization, Factors influencing accuracy, data preparation errors,	Online VC / PPT



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		part building errors, errors in finishing, influence of part build orientation.		
10	Week 10	Software for RP: STL files, overview of solid view, magics, mimics, magics communicator, etc., internet based softwares, collaboration tools.	Online VC / PPT	
Descriptive Assessment -2				
11	Week 11	RP Technology selection, Decision Making,	Online VC / PPT	
12	Week 12	Life Cycle Assessment of RP processes, Sustainability issues	Online VC / PPT	
Assignment				
Compensation Assessment				
Final Assessment				
<b>COURSE ASSESSMENT METHODS (shall range from 4 to 6)</b>				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Descriptive Assessment – 1	End of 6 Weeks	1 Hr	25%
2	Descriptive Assessment – 2	End of 10 Weeks	1 Hr	25%
3	In class Assessment/ Assignment/ Seminar	End of 12 Weeks		20%
CPA	Compensation Assessment*	End of 12 Weeks	1 Hr	25%
5	Final Assessment *	End of semester	2 Hrs	30%
<b>*mandatory; refer to guidelines on page 4</b>				
<b>COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)</b>				
Course Exit survey will be collected at the end of the semester before the start of semester examination through online. Students can log in their MIS account to give the feedback. Mid-semester anonymous feedback shall be collected to improve the teaching-learning process. Apart from this, students can share feedback during class committee meetings.				
<b>COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)</b>				
<b><u>MODE OF CORRESPONDENCE (email/ phone etc)</u></b>				
senthil@nitt.edu				



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**COMPENSATION ASSESSMENT POLICY**

If any student is not able to attend any of the descriptive assessments (1 or 2, or both) due to genuine reason, student is permitted to attend the compensation assessment with 25 % weightage.

Minimum 40% mark is required for passing the course. Reassessment shall be conducted for failed / absented (in final assessment) in the beginning of next session. Failed (in final assessment) candidates shall get a maximum of E grade in the reassessment.

**ATTENDANCE POLICY**

- As per the NIT, Trichy institute norms
- Students with below minimum attendance as mentioned in NIT, Trichy institute norms shall be prevented from writing the final assessment and shall be awarded 'V' grade.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

**ADDITIONAL INFORMATION, IF ANY**

The Course teacher is available for consultation in the department after class hours. Queries may also be emailed to the Course Coordinator directly at [senthil@nitt.edu](mailto:senthil@nitt.edu)

**FOR APPROVAL**

Course Faculty 

CC-Chairperson 

HOD 

(Dr. P. Senthil)



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**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

<b>B.Tech. Admitted in</b>				<b>P.G.</b>
<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	
35% or (Class average/2) whichever is greater.	(Class average/2) whichever is greater.	(Peak/3) or (Class Average/2) whichever is lower	(Class average/2) whichever is greater.	40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.