

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

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech. & Manufacturing Technology and Industrial Engineering and Management, II Semester		
Course Title	Industry 4.0 and Cloud Manufacturing		
Course Code	PRPE668	No. of Credits	03
Course Code of Pre-requisite subject(s)	----	---	---
Session	Jan 2022	Section (if, applicable)	-
Name of Faculty	Dr. A.Evangeline	Department	Production Engineering
Email	evangeline@nitt.edu	Telephone No.	+91 9789179702
Name of Course Coordinator(s) (if, applicable)	-		
E-mail	-	Telephone No.	-
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p style="text-align: center;">PR668 Industry 4.0 and Cloud Mnuufacturing</p> <p>Various Industrial Revolutions, Compelling Forces and Challenges for Industry 4.0, Comparison of Industry 4.0 Factory and Today's Factory, Lean Production Systems.</p> <p>Internet of Things (IoT)- IoT design methods, physical devices and enabling technologies, Industrial Internet of Things (IIoT), Smart Manufacturing.</p>			

Cyberphysical Systems, Support System for Industry 4.0, Cyber Security, Collaborative Platform and Product Lifecycle Management, Artificial Intelligence, Big Data and Predictive analytics.

Introduction to cloud computing and manufacturing- cloud models, cloud manufacturing examples, cloud based manufacturing, Cloud service and platforms for manufacturing.

Industry 4.0 integration with manufacturing systems, Application domains, Case studies on IoT cloud system in manufacturing and other domains

COURSE OBJECTIVES

- To understand trends, innovations and global happenings involved in Industry 4.0

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. To recognize need and trends of Industry 4.0 and Cloud manufacturing	Unit-I, II
2. To understand concepts and technologies supporting Industry 4.0 and Cloud Systems To explore challenges and Industrial applications of Industry 4.0 in manufacturing	Unit-III, IV & V

COURSE PLAN – PART II

COURSE OVERVIEW

The aim of this course is to learn about the essential goal of Industry 4.0 the future of manufacturing – and related industries such as logistics – faster, more efficient and more customer-centric, while at the same time going beyond automation and optimization and detect new business opportunities and models. Cloud Manufacturing transforms traditional manufacturing resources into services using cloud computing, the Internet of Things (IoT) as well as virtualization and makes them available over the Internet.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No	Week/Contact Hours	Topic	Mode of Delivery
1	Week-1	Various Industrial Revolutions.	Online mode of teaching
2	Week-2	Compelling Forces and Challenges for Industry 4.0.	Online mode of teaching
		Comparison of Industry 4.0 Factory and Today's Factory.	
		Lean Production Systems.	
3	Week-3	Internet of Things (IoT)	Online mode of teaching
		IoT design methods.	
		IoT - Physical devices.	
4	Week-4	IoT enabling technologies.	Online mode of teaching
		Industrial Internet of Things (IIoT).	
		Smart Manufacturing.	
5	Week-5	Cyberphysical Systems.	Online mode of teaching
		Support System for Industry 4.0.	
6	Week-6	Cyber Security, Collaborative Platform .	Online mode of teaching
		Product Lifecycle Management.	

7	Week-7	Artificial Intelligence.	Online mode of teaching
		Big Data and Predictive analytics	
8	Week-8	Introduction to cloud computing.	Online mode of teaching
		Manufacturing- cloud models.	
		Cloud manufacturing examples.	
9	Week-9	Cloud based manufacturing.	Online mode of teaching
		Cloud service and platforms for manufacturing.	
10	Week-10	Industry 4.0 integration with manufacturing systems.	Online mode of teaching
11	Week-11	Application domains of Industry 4.0	Online mode of teaching
12	Week-12	Case studies on IoT cloud system in manufacturing and other domains	Online mode of teaching

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment	Week-7	---	10
2	Cycle test -1	Week-7	60 Minutes	30
3	Cycle test -2	Week-10	60 Minutes	30
CPA	Compensation Assessment*	Week-12	60 Minutes	30
4	Final Assessment *	Week-14	180 Minutes	30
	Final Assessment for grading			100

***mandatory; refer to guidelines on page 5**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

- Feedback from the students during class committee meetings

- Anonymous feedback through questionnaire (Mid of the semester & End of the semester) optional

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

- All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes schedule of assessment course material any other information regarding this course) will be done through their webmail only.
- Queries may be emailed to the course coordinator directly at evangeline@nitt.edu.

COMPENSATION ASSESSMENT POLICY

- If any of the students is absent for continuous assessment due to genuine reason, those absentees are allowed to attend the Compensatory assessment.
- In any case, Compensation Assessment* will not be considered as an improvement test.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** 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

Students should refer more books for in-depth knowledge about the course.

FOR APPROVAL

A. Evangelina

Course Faculty _____ **CC-Chairperson** _____ **HOD**

Guidelines:

- a) The number of assessments for a course shall range from 4 to 6.
- b) Every 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.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or class average/2 whichever is greater.		Peak/3 or class average/2 whichever is lower		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.