DEPARTMENT OF PRODUCTION ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**B. Tech. & Production Engineering Department, IV Semester**		
Course Title	**INDUSTRY 4.0**		
Course Code	**PRPE24**	**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	☐ **Core course** ☑ **Elective course**		

Syllabus (approved in BoS)

PRPE24 Industry 4.0

Various Industrial Revolutions, Digitalization and the Networked Economy, Drivers, Enablers, Compelling Forces and Challenges for Industry 4.0, Digital twin - Trends of Industrial Big Data and Predictive Analytics for Smart Business Transformation, Lean Production Systems.

Sensing & actuation, Internet of Things (IoT) & Industrial Internet of Things (IIoT) & Internet of Services, Smart Manufacturing, Smart Devices and Products, Smart Logistics, Predictive Analytics

Cyberphysical Systems, Robotic Automation and Collaborative Robots, Support System for Industry 4.0, Cyber Security, Collaborative Platform and Product Lifecycle Management, Augmented Reality and Virtual Reality, Artificial Intelligence, Big Data and Advanced Analysis

Resource-based view of a firm, Data as a new resource for organizations, Harnessing and sharing knowledge in organizations, Cloud Computing Basics, Cloud Computing and Industry 4.0

Industry 4.0 laboratories, IIoT case studies, Application Domains, Business Issues, Opportunities and Challenges, Strategies for competing in an Industry 4.0 world

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. To understand concepts and technologies supporting Industry 4.0.	Unit-I, II, III
2. To explore challenges and industrial applications of Industry 4.0.	Unit-IV & V

COURSE PLAN – PART II

COURSE OVERVIEW

The aim of this course is to learn about the essential goal of Industry 4.0 is to make 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.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week-1	Introduction about Industry 4.0	Online mode of teaching
2	Week-2	Various Industrial Revolutions, Digitalization and the Networked Economy.	Online mode of teaching
		Drivers, Enablers,	
		Compelling Forces and Challenges for Industry 4.0.	
3	Week-3	Digital twin - Trends of Industrial Big Data.	Online mode of teaching
		Predictive Analytics for Smart Business Transformation.	
		Lean Production Systems.	
4	Week-4	Sensing & actuation.	Online mode of teaching
		Internet of Things (IoT) & Industrial Internet of Things (IIoT) .	
		Internet of Services, Smart Manufacturing.	
5	Week-5	Smart Devices and Products.	Online mode of teaching
		Predictive Analytics.	
		Cyberphysical Systems.	
6	Week-6	Robotic Automation and Collaborative Robots.	Online mode of teaching
		Support System for Industry 4.0, Cyber Security.	
		Collaborative Platform.	

7	Week-7	Augmented Reality and Virtual Reality.	Online mode of teaching
		Artificial Intelligence.	
		Resource-based view of a firm.	
8	Week-8	Data as a new resource for organizations.	Online mode of teaching
		Harnessing and sharing knowledge in organizations.	
		Cloud Computing Basics, Cloud Computing.	
9	Week-9	Industry 4.0	Online mode of teaching
		Industry 4.0 laboratories.	
		IIoT case studies.	
10	Week-10	Application Domains.	Online mode of teaching
		Business Issues.	
		Opportunities and Challenges.	
11	Week-11	Strategies for competing in an Industry 4.0 world	Online mode of teaching
		Big Data and Advanced Analysis	
		Product Lifecycle Management.	
12	Week-12	Smart Logistics.	Online mode of teaching
		Case Studies related to current scenario	
		Discussion and Self Evaluation of the understanding of topics regarding Industry 4.0	

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

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.