

DEPARTMENT OF PRODUCTION ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Sustainable Manufacturing		
Course Code	PR671	No. of Credits	3
Course Code of Pre-requisite subject(s)	PR666		
Session	Jan. 2018	Section (if, applicable)	
Name of Faculty	Dr S Vinodh	Department	Production Engg
Email	vinodh@nitt.edu	Telephone No.	0431-2503520
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>Concepts of sustainability and sustainable development – Need for sustainable development - Components of sustainability- Social, Economic, Environmental dimensions - Linkages between technology and sustainability - Sustainable Manufacturing –Scope, Need and Benefits.</p> <p>Tools and Techniques of Sustainable Manufacturing – Environmental Conscious Quality Function Deployment, Life cycle assessment, Design for Environment, R3 and R6 cycles, Design for Disassembly -Sustainable Product Development – Various Phases.</p> <p>EIA Methods –CML, EI 95 and 99, ISO 14001 EMS and PAS 2050 standards, Environmental Impact parameters - Interactions between energy and technology and their implications for environment and sustainable development.</p> <p>Design for recycling – Eco friendly product design methods – Methods to infuse sustainability in early product design phases – Multi-Criteria Decision Making in Sustainability.</p> <p>Frameworks for measuring sustainability- Indicators of sustainability – Environmental, Economic, Societal and Business indicators - Concept Models and Various Approaches, Product Sustainability and Risk/Benefit assessment– Corporate Social Responsibility.</p>			

COURSE OBJECTIVES	
1. This course aims at enabling the students to recognize the scope and principles of sustainable manufacturing	
2. This course provides insights to students on tools/techniques of sustainable manufacturing	
3. This course provides hands on experience for application of sustainable manufacturing concepts	
COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
1. Competence to recognize the importance of sustainable manufacturing	2,3,5
2. Understand and apply appropriate sustainability tools/techniques	1,2,3,5,6,9
3. Recognize applications of sustainability concepts in various domains	2,5,6,9,10,11

COURSE PLAN – PART II			
COURSE OVERVIEW			
This course starts with discussing the scope, benefits and importance of Sustainable manufacturing detailing the Triple Bottom Line approach. Tools/techniques of sustainable manufacturing will be discussed with appropriate examples. Standards and Environmental Impact Assessment methods will be illustrated with sustainable product development approach and sustainability measurement. Hands on training on Sustainability analysis module and Life Cycle Assessment will be provided.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/ Contact Hours	Topic	Mode of Delivery
1	1	Concepts of sustainability and sustainable development	C&T
2	1	Need for sustainable development	PPT
3	2	Components of sustainability- Social, Economic, Environmental dimensions	PPT
4	2	Linkages between technology and sustainability	C&T

5	2	Sustainable Manufacturing –Scope, Need and Benefits	PPT
6	3	Tools and Techniques of Sustainable Manufacturing	PPT
7	3	Environmental Conscious Quality Function Deployment	C&T
8	3	Life cycle assessment	C&T
9	4	Design for Environment	PPT
10	4	R3 and R6 cycles	PPT, C&T
11	4	Design for Disassembly	PPT, C&T
12	5	Sustainable Product Development – Various Phases	PPT
13	5	Assignment/Tutorial I	Tutorial
14	5	EIA Methods –CML	PPT
15	6	EI 95 and 99	PPT
16	6	ISO 14001 EMS	PPT
17	6	PAS 2050 standards	C&T
18	7	Environmental Impact parameters	C&T
19	7	Interactions between energy and technology and their implications for environment and sustainable development	Tutorial
20	8	Design for recycling	PPT
21	8	Eco friendly product design methods	PPT
22	9	Methods to infuse sustainability in early product design phases	PPT
23	9	Multi-Criteria Decision Making in Sustainability	PPT
24	10	Assignment/Tutorial II	Tutorial
25	10	Frameworks for measuring sustainability	PPT
26	11	Indicators of sustainability	PPT
27	11	Environmental, Economic, Societal and	PPT

		Business indicators	
28	12	Product Sustainability and Risk/Benefit assessment	C&T
29	12	Corporate Social Responsibility	C&T
30	13	Case studies on Sustainable Manufacturing	PPT
31	13	Laboratory Demonstration	PPT
32	14	Field activity /Industry visit	Activity

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test I	6	1 Hour	20
2	Cycle Test II	10	1 Hour	20
3	Assignments/Tutorials/Quizzes /Activity	5,10	1 Hour	20
CPA	Compensation Assessment*	14	1 Hour	20
4	Final Assessment *	15	2 Hours	40

*mandatory; refer to guidelines on page 4

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

At the end of the semester students will give feedback online (MIS) as well feedback will be gathered during class committee meetings. Also, mid semester feedback will be obtained through questionnaire.

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

Students need to interact with faculty during class hours and over email

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. All the students are expected to attend all the contact hours.
2. Every student should maintain minimum 75% attendance in these contact hours.

3. Any student, who fails to maintain 75% attendance need to score more than 50% marks in the assessments 1 to 4 (in total) for attending the final assessment. Students fail to satisfy this criteria will have to REDO the course

4. However students fail to maintain 50% attendance will have to REDO the course.

COMPENSATION ASSESSMENT

1. Attending all the assessments are MANDATORY for every student.
2. One compensation assessment (CPA) will be conducted for those students who are being physically absent for the assessment 1 and 2.
3. At any case, CPA will not be considered as an improvement test.
4. Relative grading will be adopted for the course.

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using material in any form (paper, mobile phone etc.,) for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.

ADDITIONAL INFORMATION

FOR APPROVAL

Course Faculty

Sharon
11.1.2018

CC-Chairperson

[Signature]
11/1/18

HOD

[Signature]