Course Code: MEC 3201	**Course Title:** Industry 4.0 **Type of Course:** Open Elective	**L- P- C**	3	0	3
Version No.	1.0				
Course Pre-requisites	**Nil**				
Anti-requisites	**NIL**				
Course Description	**This course provides students with an introduction to Industry 4.0, its building blocks, its applications and advantages compared to conventional production techniques. Learners get a deep insight into how intelligent processes, big data, and artificial intelligence can be used to build up the production of the future. Also enabling design principles that support companies in identifying and implementing various Industry 4.0 scenarios and the key technologies for smart factories. The course also discusses the Impact of Industry 4.0 on Society: Impact on Business, Government, People etc & also future framework of Industry 4.0.**				
Course Objective	The objective of the course is to familiarize the learners with the concepts of **Industry 4.0** attain **Entrepreneurship** through E**xperiential Learning** techniques.				
Course Outcomes	**On successful completion of this course the students shall be able to:** **(1) Understand the basic concepts of Industry 4.0 and scope for Indian Industry** **(2) Demonstrate conceptual framework and road map of Industry 4.0** **(3) Apply Industry 4.0 for various fields of application** **(4) Understand the Impact to Industry 4.0 for various fields of application**				
Course Content:					
Module 1	**Introduction to Industry 4.0**	Assignment	Case Study		**10 classes**

Topics:
Introduction, History, core idea of Industry 4.0,origin concept of industry 4.0,Industry 4.0 produ system, current state of industry 4.0, Technologies of Industry 4.0 – Big Data – Artificial Intelligence Industrial Internet of Things - Cyber Security – Cloud – Augmented Reality , How is India preparin Industry 4.0

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Module 2	**Conceptual Framework for Industry 4.0**	Case Study	Simulation and data analysis task	**10 classes**
Topics: Introduction, Main Concepts and Components of Industry 4.0, The Basic Characteristics of Industry 4.0, General framework, The Industry 4.0 Model Framework				
Module 3	**Applications of Industry 4.0**	Assignment	Data Collection and Analysis	**10 classes**
Topics: Manufacturing (Additive Manufacturing & Lean Manufacturing) – Healthcare – Education – Aerospace and Defense – Agriculture – Transportation and Logistics **.**				
Module 4	**Impact of Industry 4.0**	Assignment	Case Study	**10 classes**
Topics: Impact of Industry 4.0 on Society: Impact on Business, Government, People. **.** Education 4.0 – Curriculum 4.0 – Faculty 4.0 – Skills required for Future - Framework for aligning Education with Industry 4.0 – Framework for achieving next ten years vision – Challenges				
Targeted Application & Tools that can be used: **Application Area are wearables (Samsung, Apple), health (GE Healthcare), traffic monitoring (Waze, google maps), fleet management, smart grid and energy saving (PowerGrid), agriculture, hospitality etc.** **Professionally Used Software: Kinoma, Arduino, Device Hive, Riot etc.**				
Project work/Assignment:				
Project Assignment: **Energy harvesting technologies, Linear and Switching regulators, working with Inertial Measurement Units, RFID tags, LiDARs,** **1. Samuel Greengard, "Internet of Things", The MIT Press (20 March 2015)**				
References **1. Alp Ustundag and Emre Cevikcan,"Industry 4.0: Managing the Digital Transformation".** **2. Bartodziej, Christoph Jan,"The Concept Industry 4.0".** **3. Klaus Schwab,"The Fourth Industrial Revolution".** **4. Christian Schröder ,"The Challenges of Industry 4.0 for Small and Medium-sized Enterprises".** **E Resource** **https://presiuniv.knimbus.com/user#/viewDetail?searchResultType=ECATALOGUE_BASED&unique_id=DOAB_1_2964**				
	Topics relevant to "Entrepreneurial Skills": Healthcare – Education – Aerospace and Defense – Agriculture – Transportation and Logistics **for developing Enterpreneurial**			

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

	Skills through Experiential Learning techniques. This is attained through assessment component mentioned in the course handout.
Catalogue prepared by	Dr. Ramachandra C G
Recommended by the Board of Studies on	3rd BOS held on 10th July 2023
Date of Approval by the Academic Council	21st Academic Council dated on _____

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

ACA-2 [2020] COURSE HAND OUT [Revision 01- Nov/2020]

SCHOOL: Engineering **DEPT.:** Mechanical **DATE OF ISSUE:** 19-04-2021

NAME OF THE PROGRAM	M. Tech - Product Design and Development
P.R.C. APPROVAL REF.	PU/AC-10/82/01_2020
SEMESTER/YEAR	**2**nd /3rd
COURSE TITLE & CODE	Marketing Research & MEC 369
COURSE CREDIT STRUCTURE	4-0-0-4
CONTACT HOURS	60 *[ONLINE – MICROSOFT TEAMS]*
COURSE INSTRUCTOR'S	Dr. R. Jothi Basu

PROGRAM OUTCOMES:

Graduates of the M. Tech. Program in M.Tech - Product Design & Development will be able to:

a) **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b) **PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c) **PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d) **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e) **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

activities with an understanding of the limitations.

f) **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g) **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h) **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i) **PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j) **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k) **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

l) **PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

COURSE PREREQUISITES:

1. Fundamental knowledge in Statistical concepts.

COURSE DESCRIPTION:

This course offers both theoretical and practical approaches for the purpose of designing and conducting market research projects. The approach of the course balances the fundamental qualitative methodologies and theoretical structures with practical applications of qualitative and quantitative techniques. In the end, students should to be able to design and implement their own market research projects. This course emphasizes both critical thinking and hands-on application.

COURSE OUTCOMES: On successful completion of the course the students shall be able to:

CO1: Understand the relationship between market research and decision making.

CO2: Construct suitable research design for the problem under taken.

CO3: Appraise the need of sampling in the real business environment.

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

CO4: Solve the real world problem with the help of statistical tools and techniques.

CO5: Apply Structural Equation Modelling techniques to research problems.

MAPPING OF C.O. WITH P.O.

[H-HIGH , M- MODERATE, L-LOW]

	PO1	PO2	PO3	PO04	PO05	PO11
CO1	L	L	H	L	M	H
CO2	H	M	H	H	L	L
CO3	L	H	M	H	L	L
CO4	L	H	H	M	M	H
CO5	M	M	H	H	H	L

COURSE CONTENT (SYLLABUS):

UNIT I INTRODUCTION TO MARKETING

The objective of this module is to "Understand the relationship between market research and decision making"- [CO 1].

The sections covered under this module is as follows:

I. **Theory:** Definition – Classification - The Marketing Research Process - The Role of Marketing Research in Marketing Decision Making - Marketing Research and Competitive Intelligence - Defining the Marketing Research Problem – Importance, The Process of Defining the Problem and Developing an Approach, Components of the Approach. International Marketing Research.

II. **Application:** NIL

III. **Experimentation:** NIL

[8] [Blooms 'level selected: Comprehension level]

UNIT II RESEARCH DESIGN

The objective of this module is to "Construct suitable research design for the problem under taken"- [CO 2].

The sections covered under this module is as follows:

I. **Theory:** Research Design: Classification - Exploratory Research, Descriptive Research, Causal Research - Potential Sources of Error - Primary Versus Secondary Data - Advantages and Uses of Secondary Data - Classification of Secondary Data - Computerized Databases. Qualitative Versus Quantitative Research - A Classification of Qualitative Research Procedures, Analysis

of Qualitative Data. Survey and Observation - Survey Methods, A Comparative Evaluation of Survey Methods

II. **Application:** Illustrative Examples on

Causal Research Design: Experimentation – Pre experimental Designs, True Experimental Designs, Quasi-Experimental Designs, Statistical Designs.

III. **Experimentation:** NIL

[12] [Blooms 'level selected: Analysis level]

UNIT III QUESTIONNAIRE AND SAMPLING DESIGN

The objective of this module is to "Appraise the need of sampling in the real business environment"- [CO 3].

The sections covered under this module is as follows:

I. **Theory:** Questionnaires and Observation Forms, Questionnaire Design Process, Choosing Question Structure, Form and Layout, Computer and Internet Questionnaire Construction. Sampling Design - The Sampling Design Process, Classification of Sampling Techniques,

II. **Application:** Illustrative Examples on

Statistical Approach to Determining Sample Size

III. **Experimentation:** NIL

[8] [Blooms 'level selected: Application level]

UNIT IV DATA PREPARATION AND ANALYSIS

The objective of this module is to "Solve the real world problem with the help of statistical tools and techniques."- [CO 4].

The sections covered under this module is as follows:

I. **Theory:** The Data-Preparation Process - Statistically Adjusting the Data, Selecting a Data Analysis Strategy, Statistical Software, Frequency Distribution, Hypothesis Testing, Procedure for Hypothesis Testing.

II. **Application:** Illustrative Examples on

Analysis of Variance - One-Way Analysis of Variance, N-Way Analysis of Variance, Multivariate Analysis of Variance. Correlation and Regression - Regression Analysis, Bivariate Regression, Multiple Regression, Conducting Multiple Regression Analysis.

III. **Experimentation:** NIL

[12] [Blooms 'level selected: Application level]

UNIT V STRUCTURAL EQUATION MODELING AND PATH ANALYSIS

The objective of this module is to "Apply Structural Equation Modelling techniques to research problems."- [CO 5].

The sections covered under this module is as follows:

I. **Theory:** Basic Concept, Foundations of SEM, Conducting SEM, Define the Individual Constructs, Specify the Measurement Model, Assess Measurement Model Reliability and Validity, Specify the Structural Model, Assess Structural Model Validity.

II. **Application:** NIL

Structural Equation Modelling

Path Analysis

III. **Experimentation:** NIL

[10] [Blooms 'level selected: Analysis level]

DELIVERY PROCEDURE (PEDAGOGY):

SELF LEARNING: Sampling Design

PROBLEM BASED LEARNING: Hypothesis Testing, SEM.

EXPERIMENT BASED LEARNING: - Sampling Plan, SEM.

PARTICIPATIVE BASED LEARNING: selection of suitable research design for the given setting.

TECHNOLOGY ENABLED LEARNING:

i. Open source SEM software (http://www.openmx-square.org/)

ii. Open source for statistical analysis (https://www.gnu.org/software/pspp/get.html)

All other topics will be covered through lectures.

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

REFERENCE MATERIALS: Textbooks, reference books, any other resources, like webpages.

Textbooks:

1. Naresh K.Malhotra, Satyabhushan Dash, "Marketing Research: An Applied Orientation",6th Edition, Pearson, ISBN 978-81-317-3181-9.

Reference books:

1. Donald S.Tull, Del I.Hawkins, "Marketing Research: Measurement and Method",6th Edition, Eastern Economy Edition, Prentice Hall India, ISBN-978-81-203-0961-6.
2. Paul E.Green, Donald S.Tull, Gerald Albaum, "Research for Marketing Decisions", Eastern Economy Edition,5th Edition, Prentice Hall India, ISBN-978-81-203-0757-5.

GUIDELINES TO STUDENTS: (Here mention a few tips to study this course effectively)

• The students are advised to be very much regular to the lectures and sincerely attempt the learnings listed in the Pedagogical section.

• The students are advised to take down the notes legibly which serves as a first-hand information to study and revise lecture topics on day to day basis.

• The students are advised to visit the Edhitch portal on a regular basis to study the supporting materials shared by the course instructors.

• The students are advised to visit the library during their allotted slots and use the journals, technical magazines and other relevant materials.

• The students are advised to watch the video lectures available online to understand and review the concepts delivered in the class room as well as problems assigned for self-learning topics.

• The students are advised to get connected with the professional social media platforms such as LinkedIn to understand the job opportunities for placement.

COURSE SCHEDULE: (This is a macro level planning. Mention the unit wise expected starting and ending dates along with the tests/assignments/quiz and any other activities) [allot about 75% for delivary,about10 to 12% for Evaluation Discussion, about 10 to 15% on integrating the learning Modules within the course and to the program]

Sl. No.	ACTIVITY	STARTING DATE	CONCLUDING DATE	TOTAL NUMBER OF PERIODS
01	Over View of the course	23-08-2021	23-08-2021	1
02	Module : 01	24-08-2021	09-09-2021	8
02	Module: 02	13-09-2021	04-10-2021	12
03	Assignment 1	15-09-2021	15-09-2021	-
04	Module:03	05-10-2021	21-10-2021	8

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

05	**Mid Term Test**	To be announced	To be announced	-
06	**Module:04**	22-10-2021	15-11-2021	12
07	**Assignment 2**	16-11-2021	16-11-2021	-
08	**Module:05**	16-11-2021	05-12-2021	10
09	**Final Exam**	To be decided	To be decided	-

SCHEDULE OF INSTRUCTION: (This is a micro level planning and this is prepared unit wise. At the end of each Unit, mention unit is concluded.) [Here Mention the Self Learning component and the Innovative Methods if any.]

Sl.no	Session Number	Lesson Title	Topics	Course Outcome Number	Delivery Mode	Reference
01	**1**	Introduction to the Course	Syllabus, Handout	**CO-1 to 5**	**L**	**T1, R1, R2**
02	**2**	Introduction to Marketing Research	Definition – Classification.	**CO-1**	**L**	**T1, R2**
03	**3**	Marketing Research Process	The Marketing Research Process, The Role of Marketing Research in Marketing Decision Making	**CO-1**	**L**	**T1, R2**
04	**4**	Importance of Marketing Research	Marketing Research and Competitive Intelligence -	**CO-1**	**L**	**T1, R1**
05	**5**	Marketing Research Problem	Defining the Marketing Research Problem, its Importance,	**CO-1**	**L**	**T1, R2**
06	**6**	Marketing Research Problem	The Process of Defining the Problem and Developing an Approach,	**CO-1**	**L**	**T1, R1**
07	**7**	Marketing Research Problem	Components of the Approach.	**CO-1**	**L**	**T1, R2**
08	**8**	Marketing Research Problem	Case Studies	**CO-1**	**L**	**T1, R2**
09	**9**	Marketing Research Problem	International Marketing Research			
MODULE -1 COMPLETED						
10	**10**	Research Design	Introduction and Classification	**CO-2**	**L**	**T1, R2**
11	**11**	Classification	Exploratory Research, Descriptive Research, Causal Research	**CO-2**	**L**	**T1, R1**
12	**12**	Data	Potential Sources of Error, Primary Versus Secondary Data.	**CO-2**	**L**	**T1, R2**
13	**13**	Data	Advantages and Uses of Secondary Data, Classification of Secondary Data	**CO-2**	**L**	**T1, R2**

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

14	**14**	Data	Computerized Databases.	**CO-2**	**L**	**T1, R2**
15	**15**	Type of Research	Qualitative Versus Quantitative Research	**CO-2**	**L**	**T1, R1**
16	**16**	Type of Research	A Classification of Qualitative Research Procedures, Analysis of Qualitative Data.	**CO-2**	**L**	**T1, R1**
17	**17**	Survey Design	Survey and Observation - Survey Methods.	**CO-2**	**L**	**T1, R2**
18	**18**	Survey Design	A Comparative Evaluation of Survey Methods.	**CO-2**	**L**	**T1, R1**
19	**19**	Causal Research	Causal Research Design: Experimentation – Pre experimental Designs,	**CO-2**	**L**	**T1, R1**
20	**20**	Causal Research	True Experimental Designs, Quasi-Experimental Designs,	**CO-2**	**L**	**T1, R1**
21	**21**	Causal Research	Statistical Designs	**CO-2**	**L**	**T1, R1**
22		**Assignment-1**	Pertaining to Module 2	**CO-2**	**L**	**T1, R2**
23		**Quiz-1**	Pertaining to Module 1 & 2	**CO-1 & CO-2**		
MODULE -2 COMPLETED						
24	**22**	Questionnaire Design	Questionnaires and Observation Forms.	**CO-3**	**L**	**T1, R1**
25	**23**	Questionnaire Design	Questionnaire Design Process, Choosing Question Structure.	**CO-3**	**L**	**T1, R1**
26	**24**	Questionnaire Design	Form and Layout.	**CO-3**	**L**	**T1, R1**
27	**25**	Questionnaire Design	Computer and Internet Questionnaire Construction.	**CO-3**	**L**	**T1, R1**
28	**26**	Sampling Design	The Sampling Design Process, Procedure	**CO-3**	**L**	**T1, R2**
29	**27**	Sampling Design	Classification of Sampling Techniques	**CO-3**	**L**	**T1, R2**
30	**28**	Statistical sampling	Statistical Approach to Determining Sample Size	**CO-3**	**L**	**T1, R2**
31	**29**	Statistical sampling	Numerical	**CO-3**	**L**	**T1, R1**
32		**Mid Term Test**	Discussion of the test paper with solution.			
MODULE -3 COMPLETED						
33	**30**	Data-Preparation	The Data-Preparation Process - Statistically Adjusting the Data,	**CO-4**	**L**	**T1, R1**
34	**31**	Data analysis	Selecting a Data Analysis Strategy, Statistical Software.	**CO-4**	**L**	**T1, R2**
35	**32**	Data analysis	Frequency Distribution, Hypothesis Testing.	**CO-4**	**L**	**T1, R2**
36	**33**	Data analysis	Procedure for Hypothesis Testing..	**CO-4**	**L**	**T1, R1**
37	**34**	Analysis of Variance	Introduction - One-Way Analysis of Variance,	**CO-4**	**L**	**T1, R2**

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

38	**35**	Analysis of Variance	One-Way Analysis of Variance - Numerical	**CO-4**	**L**	**T1, R1**
39	**36**	Analysis of Variance	N-Way Analysis of Variance, Multivariate Analysis of Variance.	**CO-4**	**L**	**T1, R1**
40	**37**	Regression analysis	Correlation and Regression - Regression Analysis,	**CO-4**	**L**	**T2, R1**
41	**38**	Regression analysis	Correlation and Regression – cases and numerical.	**CO-4**	**L**	**T2, R2**
42	**39**	Regression analysis	Bivariate Regression, Multiple Regression.	**CO-4**	**L**	**T2, R2**
43	**40**	Regression analysis	Multiple Regression -Numerical	**CO-4**	**L**	**T2, R1, R2**
44	**41**	Regression analysis	Conducting Multiple Regression Analysis	**CO-4**	**L**	**T2,R1, R2**
		Assignment-2	Pertaining to Module 3 & 4			
			MODULE -4 COMPLETED			
45	**42**	Structural Equation Modeling	Objectives, Overview, Basic Concepts.	**CO-5**	**L**	**T1, R2**
46	**43**	Structural Equation Modeling	Statistics associated with SEM, Foundations of SEM.	**CO-5**	**L**	**T1, R2**
47	**44**	Structural Equation Modeling	Conducting SEM, Define the Individual Constructs.	**CO-5**	**L**	**T1, R2**
48	**45**	Structural Equation Modeling	Specify the Measurement Model, Assess Measurement Model Reliability and Validity,	**CO-5**	**L**	**T1, R2**
49	**46**	Structural Equation Modeling	Specify the Structural Model.	**CO-5**	**L**	**T1, R1**
50	**47**	Assess Structural Model Validity	Assessing Fit, Comparison with Competing Models, Structural Model Diagnostics.	**CO-5**	**L**	**T1, R1**
51	**48**	Structural Equation Modeling	Application of SEM: First-Order Factor Model	**CO-5**	**L**	**T1, R1**
52	**49**	Structural Equation Modeling	Cases and numerical	**CO-5**	**L**	**T1, R2**
53	**50**	Path Analysis	Illustrative Example of Path Analysis	**CO-5**	**L**	**T1, R1**
54	**51**	Structural Equation Modeling and Path Analysis	Demonstration of an example with openmx Software.	**CO-5**	**L**	**T1, R2**
55		**Quiz-2**	Pertaining to Module 4 and Module 5			
MODULE -5 COMPLETED						

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

ASSESSMENT SCHEDULE: (Here mention the details of all the formal and informal evaluation methods. Formal evaluation refers to Mid Term and the End Term Final Examination. All other evaluation components come under informal evaluation.)

[Some of the samples are: Test 1, Test 2, Term End Exam, Surprise Test, Open Book test, Pre Course and Post course Test, Unit/Module wise Tests Quiz,

Sl.no	Assessment type[Include here assessment method for self-learning component also]	contents	Course outcome Number	Duration In Minutes	Marks	weightage	Venue, DATE &TIME
1	Quiz-1	Module 1 & Module 2	CO1 CO2	30	10	5%	05-10-2021
2	Assignment-1	Module 2	CO2	--	10	5%	15-09-2021
3	Mid Term Test	Module 1 & Module 2	CO1 CO2	120	40	20%	
4	Tier 1 (Participative problem solving)	Module-1 & Module-2	CO1, CO2	60	10	5%	
5	Tier 2 (Group Discussion)	Module-1 & Module-2	CO1, CO2	60	10	5%	
6	Assignment-2	Module 3 and Module 4	CO3 CO4	30	10	5%	16-11-2021
7	Quiz-2	Module 4 and Module 5	CO4 CO5	--	10	5%	05-12-2021
8	Tier 1 (Participative problem solving)	Module-3 & Module-4	CO3, CO4	60	10	5%	
9	Tier 2 (Group Discussion)	Module-3 & Module-4	CO3, CO4	60	10	5%	
10	End Term Exam	All	CO1 to CO5	180	80	40%	Will be informed

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

COURSE CLEARANCE CRITERIA:

1. For attendance requirement, refer Academic Regulation No PU/AC-11/20/06_2019 clause no 7.0.
2. Make-up test for Test 1 and Test 2 will be permitted for genuine cases only and with prior permission from the Instructor-in-charge and approval of the Dean, SOE.
3. There will be no make-up for the worksheets, case study, case let, project, assignments and quizzes.

Components of Continuous Assessments		Weightage [% of Total Marks]	Clearance Criteria
1	Midterm	20%	40 % of Total IA Marks
3	Quiz	10%	
4	Assignments	10%	
5	Tier 1 (Participative problem solving)	5%	
6	Tier 2 (Group Discussion)	5%	
7	End Term Final Examination	50%	40%

MAKEUP POLICY:

If the student misses an evaluation component, he/she may be granted a make-up. In case of an absence that is foreseen, make-up request should be personally made to the Instructor-in-Charge, well ahead of the scheduled evaluation component. Reasons for unanticipated absence that qualify a student to apply for make-up include medical emergencies or personal exigencies. In such an event, the student should contact the Instructor-in-Charge as soon as practically possible.

CONTACT TIMINGS IN THE CHAMBER FOR ANY DISCUSSIONS:

The times for these will be announced in class. Students may use this time to meet their instructor or the Instructor-in-charge for any course related discussions.

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

SAMPLE THOUGHT PROVOKING QUESTIONS: (Here type sample typical questions for students ’reference)

SL NO	QUESTION	MARKS	COURSE OUTCOME NO.	BLOOM'S LEVEL
1	How to build a regression model including stress, fitness, hardiness, exercise, and gender to predict illness using SEM software?	10	CO5	Analysis
2	“Why waste time doing basic data analysis? Why not just conduct sophisticated multivariate data analysis?” Discuss.	5	CO4	Application

Target set for course Outcome attainment and Actual Attainment:

Assessment wise Calculation:

CO	CA 1		CA 2		MT		ET		Overall Attainment		
	Target	Attainment	Target	Attainment	Target	Attainment	Target	Attainment	Max	Attainment	%Attainment
1	50	47.77			50	40.83	11	7.95	111	96.55	**86.98%**
2	50	47.77			50	40.83	20	14.46	120	103.06	**85.88%**
3			40	39.11			11	7.95	51	47.06	**92.27%**
4			40	39.11			41	29.66	81	68.77	**84.92%**
5			20	19.55			17	12.29	37	31.84	**86.05%**

Sl.no	C.O. No.	Course Outcomes	Target set for attainment in percentage	Actual attainment in percentage
01	CO1	Understand the relationship between market research and decision making.	55%	**86.98%**
02	CO2	Construct suitable research design for the problem under taken.	60%	**85.88%**

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

03	CO3	Appraise the need of sampling in the real business environment.	50%	**92.27%**
04	CO4	Solve the real world problem with the help of statistical tools and techniques.	55%	**84.92%**
05	CO5	Apply Structural Equation Modelling techniques to research problems.	60%	**86.05%**

Signature of the course Instructor **Signature of the Chairperson D.A.C.**

This course has been duly verified Approved by the D.A.C.

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

Course Code: MEC 2003	**Course Title:** Supply Chain Management **Type of Course:** Open Elective & Theory only	**L- P- C**	3	0	3
Version No.	1.0				
Course Pre-requisites	**NIL**				
Anti-requisites	**NIL**				
Course Description	**The purpose of this course is to enable the students to understand components of supply chain management, operational challenges in managing global supply chains and to develop the basic abilities in modelling supply chain. The course is both conceptual and analytical in nature. The course develops the analytical, critical thinking, and decision making skills. The course also enhances the problem solving abilities through assignments.**				
Course Objective	**This course is designed to improve the learners' EMPLOYABILITY SKILLS by using PROBLEM SOLVING Methodologies**				
Course Outcomes	**On successful completion of this course the students shall be able to:** **(1) Summarize the drivers and their role in the performance of Supply Chain.** **2) Construct Supply Chain Network according to the requirement of any particular type of product.** **3] Solve forecasting and inventory related issues in Supply Chain in practice.** **4] Estimate transportation requirements of global product in real life.** **5] Interpret the impact of future technologies in Supply Chain Management.**				
Course Content:					
Module 1	Introduction to SCM	Assignment	Data Collection and Analysis	**07 classes**	
Topics: **Understanding Supply Chain – Objectives, Importance and Decision phases in Supply Chain, Process and Cycle view, Examples of Supply Chain., Supply Chain Drivers – Various drivers, Framework for structuring drivers, Supply Chain Performance – Achieving strategic fit.**					
Module 2	Designing the Supply chain Network	Case Study	Simulation and data analysis task	**10 classes**	
Topics: **Designing distribution network – The Role of Distribution in the Supply Chain, Factors Influencing Distribution Network Design and Distribution Networks in Practice. Network Design in The Supply Chain - The Role of Network Design in the Supply Chain, Factors Influencing Network Design Decisions, Framework**					

for Network Design Decisions and Making Network Design Decisions in Practice. Designing Global Supply Chain Networks - The Impact of Globalization on Supply Chain Networks - Risk Management in Global Supply Chains, Evaluating Network Design Decisions Using Decision Trees and Making Global Supply Chain Design Decisions Under Uncertainty in Practice.				
Module 3	Planning and Coordinating Demand and Supply	Assignment	Data Collection and Analysis	**07 classes**
Topics: **Demand forecasting, Aggregate Planning in Supply Chain, Coordination in Supply Chain. Managing economies of scale in a supply chain: Cycle inventory, Managing Uncertainty In A Supply Chain: Safety Inventory, Determining The Optimal Level of Product Availability.**				
Module 4	Designing and Planning Transportation Networks	Case Study	Data collection and Programming	**08 classes**
Topics: **Transportation In a Supply Chain - The Role of Transportation in a Supply Chain, Modes of Transportation and Their Performance, Trade-Offs in Transportation Design, Tailored Transportation, The Role of IT in Transportation. Managing Cross-Functional Drivers in a Supply Chain - Sourcing Decisions In a Supply Chain, The Role of Sourcing in a Supply Chain, Third- and Fourth-Party Logistics Providers, Supplier Selection—Auctions and Negotiations.**				
Module 5	Future Technologies in Supply Chain	Assignment	Simulation and Analysis	**07 classes**
Topics: **Information Technology In a Supply Chain - The Role of IT in a Supply Chain, The Supply Chain IT Framework, Customer Relationship Management, Internal Supply Chain Management, Supplier Relationship Management. The Future Technologies in the Supply Chain – AI, Additive Manufacturing, Driverless Vehicles, IoT, Block Chain Technologies, Wearable Devices.**				
Targeted Application & Tools that can be used: **Application Area include almost all manufacturing organizations (Automotive – Hyundai, KIA, Ford etc.,) Processing industries (Petroleum – Reliance, Shell, HP etc.,), service industries like Banking, Hospital, etc. and E-commerce platforms like Amazon, Flipkart etc.** **Professionally Used Software: SAP SCM, E2Open, Oracle SCM**				
Project work/Assignment: **Project: Assuming as a Supply Chain expert of an automotive company, carryout the Supply Chain configuration analysis.** **Assignment: 1] Collect the data regarding customer market details of any of the global product and complete Logistics planning.** **Assignment 2: From your perspective, analyze the future technologies that may have the disruptive effect on global supply chains.**				
Text Book **1. Chopra, S., & Meindl, P., "Supply Chain Management: Strategy, Planning, and Operation.". Pearson Bostan, Fifth Edition, 2013.**				

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

References

1. Hugos, M., "Essentials of Supply Chain Management", John Wiley & Sons, Inc., Third Edition, 2011.

2. Christopher. M., "Logistics & Supply Chain Management ", Prentice Hall., New Delhi, Fourth Edition, 2011.

Website: https://www.ascm.org

Supply Chain Management - New Perspectives by Sanda Renko , IntechOpen, 2011

https://presiuniv.knimbus.com/user#/viewDetail?searchResultType=ECATALOGUE_BASED&unique_id=INTECH_1_2610

Supply Chain Management - Applications and Simulations, Md. Mamun Habib IntechOpen, 2011.

https://presiuniv.knimbus.com/user#/viewDetail?searchResultType=ECATALOGUE_BASED&unique_id=INTECH_1_2609

Catalogue prepared by	Dr. R. Jothi Basu
Recommended by the Board of Studies on	BOS NO: 12, BOS held on 06/08/2021
Date of Approval by the Academic Council	Academic Council Meeting No. 16, Dated 23/10/21

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

PRESIDENCY UNIVERSITY
Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi

School of Engineering

DEPARTMENT OF MECHANICAL ENGINEERING

Fast Learners Activity Schedule for Fall Semester AY 2022-23

Course Name: Supply chain Management

Course Code: MEC2003

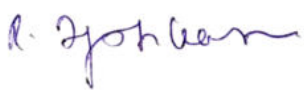
Name of the Instructor In-Charge: Dr. R. Jothi Basu

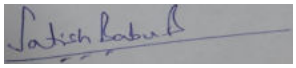
Sl.No	Roll Number	Name of the Student	Activity Assigned
1.	20201BCG0001	KUMAR ABHINAV	**Real Life Case Study:** Identify a product that you are using in your day to day life and understand the supply chain of the product. Based on your understanding, construct and explain the complete supply chain of the product considered. **Real Life Case Study:** Identify a service that you are using in your day to day life and understand the supply chain of the service. Based on your understanding, construct and explain the complete supply chain of the service considered.
2.	20201BCG0002	Abhishek Gowda	
3.	20201BCG0003	ADITHYA BINU	
4.	20201BCG0004	Aditya chowdhury	
5.	20201BCG0006	B. VIGNESS	
6.	20201BCG0007	BHAVANI VIJAYENDRAN	
7.	20201BCG0008	DEON MATHEW SABU	
8.	20201BCG0011	kohinoor suthar	
9.	20201BCG0013	Mohammed jiyad thankayathil	
10.	20201BCG0016	Preetham G Gowda	
11.	20201BCG0019	Satyajit Borgohain	
12.	20201BCG0020	Srajan Patel	
13.	20201BCG0021	Subham Agarwal	
14.	20201BCG0022	Suhail Khan	
15.	20201BCG0023	suraj . U	
16.	20201BCG0024	Tanay Deshmukh	
17.	20201BCG0026	Vishnu G	
18.	20201BCG0028	Yash Sharma	
19.	20201BCG0029	Aaron sankeshwar	
20.	20201BCG9001	NIRANJANA D	
21.	20201BCV0001	Aaditya Pradeep Chandrasekhar	
22.	20201BCV0005	DAKSHAYINI LG	
23.	20201BCV0006	Harshita Khushu	
24.	20201BCV0007	Ishita Rathod	
25.	20201BCV0008	khyati komre	
26.	20201BCV0010	RADHUNANDAN .	
27.	20201BCV0012	Rajeshwari sahani	

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

28.	20201BCV0013	Ruthvik C Reddy	
29.	20201BCV0016	Vishwajith H	
30.	20201BCV0018	YADHU KRISHNA K	
31.	20201BCV0019	CHANNILLA HARSHA VARDHAN	
32.	20201BCV0020	GAJJALA VAMSI	
33.	20201BCV0021	KARUMURU KIRANMAYEE KEERTHI	
34.	20201BCV0023	P VAISHNAVI	





Signature of Course IC **Signature of HOD-MEC**

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

PRESIDENCY UNIVERSITY
Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi

DEPARTMENT OF MECHANICAL ENGINEERING

Year: 2022-23 **Semester: V**

Sections: 5th BCA CG, AR/VR

Course Title: Supply chain Management

Course Code: MEC2003

Instructor In-Charge: Dr. R. Jothi Basu

Course Instructors: Dr. R. Jothi Basu

Name of the Topic: Identify a product that you are using in your day to day life and understand the supply chain of the product. Based on your understanding, construct and explain the complete supply chain of the product considered.

Assessment:

- **Type of Assessment:** Preparing a report based on their understanding about the product supply chain
- **Task Assigned:** Students have to consider any of the real life product that they are using. They have to explore how the product is reaching them from the source following the value chain.

REGISTRAR

REGISTRAR

PRESIDENCY UNIVERSITY
Registrar
BANGALORE

Name :- Yash Sharma. ID NO:-20201BCG0028.
Section :- 5BCA - AV/GG.
Semester :- 5th semester.
Subject :- Supply Chain Management.

BURGER KING

Burger King's focus on this strategic decision area of this strategic decision area of operation management is to differentiate its products from those of competitors. for example, the company offers flame-grilled burgers, which are relatively unique in the market This approach to operations management supports. Burger's King generic strategy and intensive growth strategies.

strategic decision area involves satisfying the quality expectation of target customer. To address this concern, Burger King's operation management maintain product tests. The company also collect customer feed back through the My BK Experience website.

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Remarks: This exercise will really help the student to understand how supply chain have impact in day to day life. Students can understand how physical flow, information and cash flow happens across the chain. Also, they could able to categorize whether the product selected demands efficient supply chain or responsive supply chain.

Name of the Topic: Identify a service that you are using in your day to day life and understand the supply chain involved. Based on your understanding, construct and explain the complete supply chain of the product considered.
Assessment:

- **Type of Assessment:** Preparing a report based on their understanding about the service supply chain
- **Task Assigned:** Students have to consider any of the real life service industry. They have to explore how the services require supply chain principles.

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

A SERVICE COMPANY SUPPY CHAIN EXAMPLE

Now we will take a look at the supply chain of a service-based company. We will use the example of a marketing firm that specializes in website and logo design as well as branding in a company such as this, there is a process of obtaining supplies, but the supplies are generally software and online tools.

A marketing firm is a service company, which means the supply chain focuses mainly on human interaction instead of large physical products using various suppliers. The production system is based on a pull strategy where the customer initiates the demand Logistically, the services are customized depending on the need of each individual client (much like the metal fabricator's different clients have different demands). Customer relations are critical to sucess and should be one of the main priorities. The supplies for a marketing firm are made from a combination of software, hardware, and print materials, meaning the inventory will not remain low. The difference for this company, as apposed to a metal fabricator, is that a "finished good" means the website, print materials, and marketing report is delivered to the client which translates to a finished product, Generally speaking, each client will have different requirements for their marketing, which means there is no definite timeline.

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

Now we will take a look At the supply chain of a service based company. We will use the example of a marketing firm that specializes in website and logo design as well as branding in a company such as this, there is a process of obtaining supplies, but the supplies are generally software and online tools. A marketing firm is a service company, which means the supply chain focuses mainly on human interaction instead of large physical products using various suppliers. The production system is based on a pull strategy because the customer initiates the demand. Logistically, the

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Remarks: This exercise will really help the student to understand how supply chain have impact in day to day life. Students can understand how physical flow, information and cash flow happens across the chain. Also, they could able to categorize whether the product selected demands efficient supply chain or responsive supply chain. Also they could differentiate product and service supply chain.

Signature of Instructors:

Signature of Instructor In-Charge:

HOD-MEC

REGISTRAR