Department of Industrial and Production Engineering

Scheme of Teaching and Evaluation
(Academic Year 2020 - 2021)

VII Semester BE

Sl. No	SUBJECT CODE	SUBJECT	CREDITS	HOURS/ WEEK			EXAMINATION MARKS		
				L	T	P	CIE	SEE	TOTAL
1	UIP750C	Operations Management	4	3	2	0	50	50	100
2	UIP702C	Plasticity and Metal Forming	3	3	0	0	50	50	100
3	UIP012E	Elective - II	3	3	0	0	50	50	100
4	UIP028E	Elective - III	3	3	0	0	50	50	100
5	UIP731N	Open Elective - II	3	3	0	0	50	50	100
6	UIP738I	Internship	2	0	0	4	50	50	100
7	UIP745P	Project Phase - I	5	0		10	50	50	100
Total			23	15	4	14	350	350	700

UIP750C	OPERATIONS MANAGEMENT	Credits: 04
L : T : P - 3 : 2 : 0		CIE Marks: 50
Total Hours / Week: 05		SEE Marks: 50

UNIT - I	10 Hrs.

Operations management concepts - Introduction, historical developments, operations management, environment of operations and operations system decisions. **System design and capacity planning -** Introduction, manufacturing and service systems, design and system capacity and capacity planning. **Facility location and layout -** Introduction, types of layouts, location planning for goods and services, economic analysis (location break-even analysis, cost minimization using transportation linear programming), and qualitative factor analysis. Facility layout: Analysis and selection of layout (minimizing cost in job shop layout), determination of layout. **Inventory Management -** Definition, Inventory planning for independent demand items, Types of inventories, Inventory costs, Inventory control for deterministic demand items, Inventory control systems, Selective control of inventory, other issues in inventory planning and control.

(10 hours Teaching +7 hours Tutorial)

UNIT - II	10 Hrs.

Forecasting: Forecasting objectives and uses, forecasting variables, forecasting methodology, opinion and judgemental methods, time series methods, exponential smoothing, regression and correlation methods. **Aggregate planning -** Introduction, objective of aggregate planning, aggregate planning methods - policy guidelines, graphic and charting methods, transportation method of solving APP, master scheduling objective, master scheduling methods.

(10 hours Teaching +7 hours Tutorial)

UNIT - III	10 Hrs.

Material requirements planning - Introduction, underlying concepts, system parameters, MRP Logic, MRP implementation. **Design of service systems -** Characteristic aspects, customer contact in service systems, complexity and divergence in service systems, service positioning, service blueprinting, other aspects of addressing capacity issues in services and service quality.

(10 hours Teaching +7 hours Tutorial)

UNIT - IV	10 Hrs.

Scheduling and controlling - Introduction, objectives of scheduling, scheduling strategies, scheduling and loading guidelines. Brief discussion on scheduling, methodology - Gantt charts, schedule boards and priority decision rules, priority and capacity control. **Single machine scheduling -** Concept, measures of performance, SPT rules, weighted mean flow time, EDD rules, minimizing total tardiness. **Flow shop scheduling -** Introduction, Johnson's problem, CDS heuristic, palmer's heuristic. **Job shop scheduling -** Types of schedules, heuristic procedure, 2 jobs M machine scheduling.

(10 hours Teaching +7 hours Tutorial)

Total: 40 hours of Teaching + 28 hours of Tutorial

Reference Books *

1. Operations Management- Monks, J.G., McGraw-Hill International Editions, 1987. ISBN 0-07-100579-X
2. Production and Operations Management- Pannerselvam. R, 2nd edition PHI. ISBN-978-81-203- 2767-2
3. Operations Management Theory and Practice- B. Mahadevan, 3rd Edition, Pearson ISBN 978-96-325-4109-2
4. Productions & Operations management – Adam & Ebert.5th edition PHI
5. Buffa, Modern Production / Operations Management, Wiely Eastern Ltd., 4th Edition.

6. Chary S. N, Production and Operations Management, Tata-McGraw Hill., 3rd Edition.
7. James Dilworth, Operations management, PHI, 3rd Edition.
8. Lee J. Karjewski and Larry P. Ritzman, Operations Management, strategy and Analysis, 6th Edition, Pearson Education Asia.

Related NPTEL Courses: https://nptel.ac.in/courses/112/107/112107238/
https://nptel.ac.in/courses/110/106/110106046/
https://nptel.ac.in/courses/110/106/110106045/
https://nptel.ac.in/courses/110/107/110107141/

E-books: http://bookboon.com/en/operations-management-ebook
MOOC Course: https://www.edx.org/course/operations-management

Course Outcomes**

1. Illustrate how operations management is important for an organization and analyse the facility location decisions, and the inventory systems.
2. Evaluate forecasting methods and apply them to real life situations and problems.
3. Analyse aggregate planning and MPS, also compare different aggregate planning methods.
4. Illustrate the importance of materials requirements planning and controlling and Analyse design of service systems.
5. Analyse the flow shop and job shop scheduling.

* **Books to be listed as per the format with decreasing level of coverage of syllabus**

** **Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		2	2	2							2		2	3	
CO2		2	3	3	2						2		2	3	
CO3		2	3	3	2						2		2	2	
CO4		2	3	3	2						2		3	3	
CO5		2	3	3	2						1		2	2	

UIP702C	PLASTICITY AND METAL FORMING	Credits: 03
L : T : P - 3 : 0 : 0		CIE Marks: 50
Total Hours / Week: 03		SEE Marks: 50

UNIT - I	10 Hrs.

Theory of metal forming processes - Classification of forming processes, flow curve, true stress and true strain, notion of stress, normal and shear stress, stress tensor, components of stress tensor, principal stresses, stress invariants, spherical and deviator stress tensors, yield criteria, Von Mises and Tresca yield criterion and problems.

UNIT - II	12 Hrs.

Forging - Classification of forging processes, forging equipment, forging analysis - calculation of pressure distribution in case of forging of a rectangular plate and circular disc in sticking, sliding and mixed conditions, forging defects and problems.

Rolling - Classification of rolling processes, rolling mills, forces and geometrical relationships in rolling, calculation of pressure distribution case of rolling of a strip (rolling analysis), defects in rolled products and problems.

UNIT - III	10 Hrs.

Extrusion - Classification of extrusion processes, analysis of extrusion process - extrusion of cylindrical rod and strip with friction and problems.

Drawing of rods, wires - Rod and wiredrawing process, analysis of drawing process - drawing of cylindrical rod and strip with friction and problems.

UNIT - IV	10 Hrs.

Tube drawing process - Introduction and analysis of tube drawing process and problems.

High energy rate forming - Introduction to HERF, explosive forming, electro hydraulic forming and electromagnetic forming.

Reference Books *

1. Theory of Plasticity and Metal Forming Processes, Dr. Sadhu Singh, Khanna Publishers, New Delhi
2. Mechanical Metallurgy by George E. Dieter, Adapted by David Bacon, (SI Metric Edition), McGraw-Hill Book Company
3. Introduction to Industrial Mechanical Working Process by G. W. Rowe.
4. Theory of Metal forming and Metal cutting, K. P. Sinha and S. C. Prasad, Dhanpat Rai & Sons, New Delhi
5. Metal Forming Processes, G. R. Nagral, Khanna Publishers, New Delhi and
6. ASM-Metals handbook.

Course Outcomes**

1. Attain proficiency in basic metal forming processes/techniques and analyze the concept of stress, strain, flow curve and yielding of materials according to different yield theory for a given state of stress.
2. Explain principle of forging, determination of pressure distribution, forging load its application and illustrate about the rolling process/operation using different analysis approach to calculate force and pressure distribution.
3. Understand and evaluate process of excursion its analysis on the process mechanics and evaluate the variables affecting rod and wire drawing processes.
4. Describe the manufacturing of tube drawing process and its analysis and get well acquaintance with high energy rate forming processes.

* **Books to be listed as per the format with decreasing level of coverage of syllabus**

** **Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1	2	2					1			3	1	2
CO2	3	2	1	2	2					1			3	1	2
CO3	3	2	1	2	2					1			3	1	2
CO4	3	2	1	2	2					1			3	1	2
CO5	3	2	1	2	2					1			3	1	2

UIP012E	MARKETING MANAGEMENT	Credits: 03
L : T : P - 3 : 0 : 0		CIE Marks: 50
Total Hours / Week: 03		SEE Marks: 50

UNIT - I	10 Hrs.

Defining marketing for the new realities - The value of marketing, the scope of marketing, core marketing concepts, the new marketing realities, and company orientation towards the marketplace. **Collecting information -** Components of modern marketing information system, Internal records, marketing intelligence, analyzing the macro environment**. Conducting marketing research -** The scope of marketing research, marketing research process, seven characteristics of good marketing research.

UNIT - II	10 Hrs.

Analyzing consumer markets - What influences consumer behavior? Key psychological processes, the buying decision process: Five stage model, behavioral decision theory and behavioral economics. **Identifying market segments and targets -** Basis for segmenting consumer markets, how should business markets be segmented? Market targeting, effective segmentation criteria. **Analyzing business markets -** What is organizational buying? Participants in the business buying process, the purchasing / procurement process, stages in the buying process, developing effective-business-to-business marketing programs, managing business-to-business customer relationships, and institutional and government markets.

UNIT - III	10 Hrs.

Setting product strategy - Product characteristics and classifications, differentiation, environmental issues product and brand relationships, packaging, labelling, warranties, and guarantees. **Designing and managing services** - The nature of services, the realities of the new service, achieving excellence in services marketing. **Managing retailing, wholesaling and logistics -** Retailing, private labels, wholesaling and market logistics.

UNIT - IV	10 Hrs.

Developing pricing strategies and programs: Understanding pricing, setting the price, adapting the price, initiating and responding to price changes. **Designing and managing integrated marketing communications -** The role of marketing communications, marketing communications mix, how do marketing communications work, developing effective communications, selecting the marketing communications mix, developing and managing an advertising programme.

Reference Books *

1. Philip Koteler, Kevin Lane Keller**,** Marketing Management, 15 Edition, Pearson India Education Services Pvt. Ltd. ISBN 978-93-325-5718-5.
2. Philip Koteler, Kevin lane Keller, Abraham Koshy and Mithileshwar Jha, 2012, Marketing Management a South Asian Perspective, 13th Edition, Pearson Prentice - Hall of India private limited, ISBN-978-81-317-1683-0.
3. Philip Koteler, Principles of Marketing, Prentice - Hall.
4. Michael R. Czinkota, Marketing Management, 2nd Edition, Vikas Publishing House, ISBN 981-240-366-3.
5. William J. Stannon, Fundamentals of Marketing, McGraw Hill.
6. R .S. S. Pillia and Mrs. Bagavathi, Marketing, S. Chand and Company. Ltd.
7. S. A. Sherlaker, Marketing Management, 13th Edition.
8. Rajagopal, Marketing Management Text and Cases, Vikas Publishing House.

MOOC Course: https://www.edx.org/course/marketing-management-iimbx-mk102x#!

NPTEL Course: http://nptel.ac.in/courses/110104068/3

Course Outcomes**
1. Discuss marketing for the new realities and design a market research program for products and services. 2. Identify market segments and analyze consumer markets and business markets. 3. Analyze the importance of product and service strategy in marketing. 4. Demonstrate the need for retailing, wholesaling, and market logistics. 5. Identify and adopt pricing strategy and mass communication programme in marketing.

*** Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		3	3	3	3								3	3	
CO2			3	2	3								2		
CO3			3			2	2						3		
CO4				3		3							2		
CO5						1		1	2	2		2	2	2	

UIP028E	JUST IN TIME MANUFACTURING	Credits: 03
L:T:P -3: 0: 0		CIEMarks:50
Total Hours/Week: 03		SEEMarks:50

UNIT-I	10 Hrs.

JIT-An Introduction: Sprea of JIT movement, the New Production System Research Association of Japan, some definitions of JIT, core Japanese practices of JIT, creating continuous manufacture, enabling JIT to occur, basic element of JIT, benefits of JIT.

Modern Production System: Key feature of Toyota's Production System, basic framework of Toyota Production System. **KANBAN SYSTEM –** other types of kanban's, kanban rules, adapting to fluctuations in demand through kanban, whirligig, determining the number of kanban's in Toyota Production System,. detailed kanban system example, supplier kanban and the sequence schedule for use by suppliers

UNIT - II	10 Hrs.

Design, Development and Management of JIT Manufacturing Systems: Plant configurations and flow analysis for JIT manufacturing, comparison of JIT's "demand pull" system with conventional "push type", planning and control systems, quality management system for JIT, product design for JIT, human resource management in JIT, flexible workforce system at Toyota, creation and maintenance of teams for JIT, union organization and conduct of industrial relations in JIT, interface of JIT with advanced manufacturing technology, assessing performance in JIT manufacturing systems, product costing information systems in JIT manufacturing, an example of overhead allocation in JIT, potential for developing countries, potential for small manufacturing.

UNIT - III	10 Hrs.

Framework for Implementation of JIT: Implementation risk, risks Due to inappropriate understanding of JIT, risks due to technical, operational and people problems, risks associated with kanban system, some important activities to be performed during implementation, steps in implementation, project work approach to implementation, conclusion.

UNIT - IV	10 Hrs.

Supply Management for JIT: JIT purchasing-the Japanese way, some studies in JIT purchasing, experience of implementation organizations, surveys of JIT purchasing, buyer-seller relationship in JIT purchasing, quality certification of suppliers in JIT purchasing, some problems in implementation of JIT purchasing, reduction of freight costs in JIT purchasing, monitoring supplier performance for JIT purchasing, audit in JIT purchasing, implementation of JIT to international sourcing, frequency of shipments, inventory policy, supplier reaction capability, quality, communication sole sourcing, delivery performance and supplier flexibility, conclusion**.**

Reference Books *

1. **Just In Time Manufacturing** - M.G. Korgaonker, Macmillan India Ltd.- 1992, EAN: 978033326635
2. **Japanese Manufacturing Techniques -** Richard J. Schonberger," The Free Press – Macmillan Pub. Co., Inc. New York - 1988.

Course Outcomes**
1. To understand how JIT concept was evolved, how to create continuous manufacture, enabling JIT to occur, basic element of JIT, benefits of JIT. 2. To know key feature of Toyota's Production System, basic framework of Toyota Production System. KANBAN SYSTEM – other types of kanban's, kanban rules, how to adapt to the fluctuations in demand through kanban 3. To be aware about the Design, Development and Management of JIT Manufacturing Systems emphasisng on Plant configurations and flow analysis and comparison of JIT's "demand pull" system with conventional "push type", planning and control systems, quality management system for JIT, product design for JIT, human resource management in JIT, flexible workforce system and creation and maintenance of teams for JIT 4. To anallyse the framework for implementation ofJIT considering Implementation risk, risks Due to inappropriate understanding of JIT, risks due to technical, operational and people problems, risks associated with kanban system 5. To understand the concept of Supply Management for JIT in connection with JIT purchasing, experience of implementation organizations, surveys of JIT purchasing, buyer-seller relationship in JIT purchasing, quality certification of suppliers in JIT purchasing, some problems in implementation of JIT purchasing

***Books to be listed as per the format with decreasing level of coverage of syllabus**
**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1							1							
CO2	1	1	1	1	1	1		1	1		1		2	1	1
CO3	2	2	1	1	1	1		1	2	1	2	1	2	2	1
CO4	3	3	2	2	2	2		1	2	1	2	1	3	2	2
CO5	3	3	2	2	3	2		2	2	2	2	1	3	3	2

UIP738I	INTERNSHIP	Credits: 02
L : T : P - 0 : 0 : 4		CIE Marks: 50
Total Hours / Week: 04		SEE Marks: 50

The students have to undertake 6 weeks of Internship at a reputed industry after 6th semester.

The main objective of this internship is to provide practical exposure to students regarding the Industry.

2) Assessment Rubrics for Internships and Technical Seminars, Mini-Project, Major Project Phase I&II of BE program

2.1 Internship

2.1.1 Internship Guidelines

- Step 1: Request Letter/ Email from the office of Training & Placement cell of the college should go to industry to allot various slots of 4-6 weeks during summer vacation.
- Step 2: Industry will confirm the training slots and the number of seats allocated for internships via Confirmation Letter/ Email.
- Step 3: Students on joining Training at the concerned Industry / Organization, submit the Joining Report/ Letters / Email.
- Step 4: Students undergo industrial training at the concerned Industry / Organization.
- Step 5: Students will submit training report after completion of internship.
- Step 6: Training Certificate to be obtained from industry.
- Step 7: List of students who have completed their internship successfully will be issued by Training and Placement Cell.

2.1.2 Internship Report

2.1.2.1 Student's Diary/ DailyLog

Student's Diary and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training. It will be evaluated on the basis of the following criteria:

- Regularity in maintenance of thediary.
- Adequacy & quality of information recorded.
- Drawings, sketches and datarecorded.
- Thought process and recording techniques used.
- Organization of the information.

2.1.2.2 Internship Report

The Internship report will be evaluated on the basis of following criteria:

- Originality.
- Adequacy and purposeful write-up.
- Organization, format, drawings, sketches, style, language etc.
- Variety and relevance of learning experience.
- Practical applications, relationships with basic theory and concepts taught in the course.

The industrial training of the students will be evaluated in three stages:

1. Evaluation by Industry.
2. Evaluation through seminar presentation and
3. Viva-voce at the Institute.

2.1.3 Evaluation Through Seminar Presentation/Viva-Voce at The Institute

The student will give a seminar based on his training report, before an expert committee constituted by the concerned departmentaspernormsoftheinstitute.Theevaluationwillbebasedonthefollowingcriteria:

- Quality of content presented.
- Proper planning for presentation.
- Effectiveness of presentation.
- Depth of knowledge and skills.
- Attendance record, daily diary, departmental reports shall also be analyzed along with the Internship Report.

Evaluation of Internship – Grading Rubric (Industry)

Evaluation Dimensions	Performance Rating			Maximum Score
	Needs Improvement	Meets Expectations	Excellent	
	0-4	5-7	8-10	
Internship Evaluation Dimensions – Grading Criteria				
Quality of Work	Work was done in a careless manner and was of erratic quality; Work assignments were usually late and required review; Made numerous errors	With a few minor exceptions, adequately performed most work requirements; Most work assignments submitted in a timely manner; Made occasional errors	Thoroughly and accurately performed all work requirements; Submitted all work assignments on time; Made few if any errors	10
Ability to Learn	Asked few questions and rarely sought out additional information Unable or slow to understand new concepts, ideas, and work assignments; Unable or unwilling to recognize mistakes and was not receptive to making needed changes and improvements	Asked relevant questions and sought out additional information from appropriate sources; Acceptable understanding of new concepts, ideas, and work assignments; Willing to take responsibility for mistakes and to make needed changes and improvements	Consistently asked relevant questions and sought out additional information from appropriate sources; Quickly understood new concepts, ideas, and work assignments; Always willing to take responsibility for mistakes and to make needed changes and improvements	10
Initiative and Creativity	Had little observable drive and required close supervision; Showed little interest in meeting standards; Did not seek out additional work and frequently procrastinated in completing assignments; suggested no new ideas or options	Worked without extensive supervision; Found problems to solve and sometimes asked for additional work assignments; Set his/her own goals and, tried to exceed requirements; offered some creative ideas	A self-starter; Consistently sought new challenges and asked for additional work assignments; Regularly approached and solved problems independently; Frequently proposed innovative and creative ideas, solutions, and/or options	10
Character Traits	Regularly exhibited a negative attitude; Dishonest and/or showed a lack of integrity on several occasions; Unable to recognize and/or was insensitive to ethical and diversity issues; Displayed significant lapses in ethical and professional behavior	Except in a few minor instances, demonstrated a positive attitude; Regularly exhibited honesty and integrity in the workplace; Usually aware of and sensitive to ethical and diversity issues on the job; Normally behaved in an ethical and professional manner	Exceptionally positive attitude; Consistently exhibited honesty and integrity in the workplace; Keenly aware of and deeply sensitive to ethical and diversity issues on the job; Always behaved in an ethical and professional manner	10

Evaluation Dimensions	Performance Rating			Maximum Score
	Needs Improvement	Meets Expectations	Excellent	
	0-4	5-7	8-10	
Internship Evaluation Dimensions – Grading Criteria				
	Generally unreliable in completing work assignments;	Generally reliable in completing tasks; Normally followed instructions and procedures; Usually attentive to detail, but work had to be reviewed occasionally; Functioned with only moderate supervision	Consistently reliable in completing work assignments;	10
Dependability	Did not follow instructions and procedures promptly or accurately;		Always followed instructions and procedures well;	
	Careless, and work needed constant follow-up;		Careful and extremely attentive to detail;	
	required close supervision		Required little or minimum supervision	
Organizational Fit	Unwilling or unable to understand and support the organization's mission, vision, and goals; Exhibited difficulty in adapting to organizational norms, expectations, and culture; Frequently seemed to disregard appropriate authority and decision-making channels	Adequately understood and supported the organization's mission, vision, and goals; Satisfactorily adapted to organizational norms, expectations, and culture; Generally functioned within appropriate authority and decision-making channels	Completely understood and fully supported the organization's mission, vision, and goals; Readily and successfully adapted to organizational norms, expectations, and culture; Consistently functioned within appropriate authority and decision-making channels	10
Response to Supervision	Rarely sought supervision when necessary; Unwilling to accept constructive criticism and advice; Seldom implemented supervisor suggestions; Unwilling to explore personal strengths and areas for improvement	Sought supervision when necessary; Receptive to constructive criticism and advice; Implemented supervisor suggestions in most cases; Willing to explore personal strengths and areas for improvement	Actively sought supervision when necessary; Always receptive to constructive criticism and advice; Successfully implemented supervisor suggestions when offered;	10
			Always willing to explore personal strengths and areas for improvement	

Evaluation of Internship – Grading Rubric (Department Evaluation Committee/Faculty)				
Evaluation Dimensions	**Performance Rating**			Maximum **Score**
	Needs Improvement	**Meets Expectations**	**Excellent**	
	0-4	**5-7**	**8-10**	
Internship Evaluation Dimensions – Grading Criteria				
Demonstration of experience	Offers little in the way of illustrating experiences Fails to adequately address how the experiences relate to the competencies.	Addresses the activities and experiences, but not so clearly and concisely	Well addressed activities and experiences as well as relating them to the program competencies.	10
Report	Unedited and difficult to read It is littered with grammatical and typographical errors, demonstrating little effort to producing a quality report. No reference is made to practical application. Lacks evidence and internship experience	Well-written for the most part but still has somewhat detracting errors that could have been fixed with additional editing prior to submission. Key concepts related to the selected evidence and internship experience are inaccurate or incomplete. Some helpful practical applications are included.	Has been carefully edited and is free or nearly free of any grammatical or typographical errors. Well-organized report is easy to read and understand and stands alone as a quality piece of writing. An accurate and complete reflection of key concepts related to the selected evidence and internship experience Practical applications are included to illuminate issues.	10
Presentation	Information is lacking/unclear and communicated in such a way that the audience cannot understand the purpose of the evidence work and internship experiences.	Information is presented in a clear manner but still lacks practical experience	Information is communicated in a thorough manner and ideas are expressed in such a way that the audience can clearly understand the evidence work and internship experiences.	10

Summary of Internship Evaluation (Industry Representative)	
Evaluation Criteria	**Score from the above tables**
Quality of Work	10
Ability to Learn	10
Initiative and Creativity	10
Character Traits	10
Dependability	10
Organizational Fit	10
Response to Supervision	10
	70
Internship Guide	
Demonstration of experience	10
Report	10
Presentation	10
	30
Total Score	**100**

UIP731N	PROJECT PHASE-I	Credits: 05
L : T : P - 3 : 0 : 0		CIE Marks: 50
Total Hours / Week: 10		SEE Marks: 50

	160 Hrs.
Continuous Internal Evaluation (CIE): 50 marks **The CIE will be based on a project diary and two evaluations of 15 marks each.**	
Continuous Evaluation by guide: 20 marks.	
Evaluation 1 will include (along with CIE -I):15 marks ▪ **Motivation and Rationale behind the work** ▪ **Literature review** ▪ **Presentation**	
Evaluation 2 will include (along with CIE -II):15 marks ▪ **Proposed design methodology** ▪ **Preliminary/Conceptual Design work** ▪ **Presentation and Report**	
Evaluation by Guide will include: ▪ **Objectives and Feasibility study** ▪ **Survey and Problem identification** ▪ **Involvement in the work and ability to work in team** ▪ **Individual Contribution and Peer/Guide interaction**	
All three evaluation are done by ▪ **HOD or his Nominee** ▪ **Guide** ▪ **Project Coordinator**	
Semester End Examination (SEE):50 marks The evaluation will be based on **project paper, project presentation, viva-voce and report submitted by project associates**. Evaluation committee consists of ▪ **HOD or his nominee** ▪ **External Examiner** ▪ **Project Coordinator**	

Rubrics for Project Phase - I and II (VII + VIII Semester)

SEMESTER VII

Rubrics for	Phase	Period (Duration)	Rubric #	Marks	Evaluation by
CIE	Evaluation - I	Before the end of first month in VII semester of BE Program	R1	15	Committee consisting of HOD/Nominee + Project Coordinator + Guide(s)
	Evaluation - II	Before 15 days from the last working day of VII semester of BE Program	R2	15	
	Evaluation by guide	In the last week of working days of VII semester	R3	20	Guide(s)
SEE	Semester End Examination	During SEE of VII semester of BE Program	R4	50	Committee consisting of HOD / Nominee + Project Coordinator + External Examiner

SEMESTER VIII

Rubrics for	Phase	Period (Duration)	Rubric #	Marks	Evaluation by
CIE	Evaluation - I	Before the end of first month in VIII semester of BE Program	R5	15	Committee consisting of HOD/Nominee + Project Coordinator + Guide(s)
	Evaluation - II	Before 15 days from the last working day of VIII semester of BE Program	R6	15	
	Evaluation by guide	In the last week of working days of VIII semester	R7	20	Guide(s)
SEE	Semester End Examination	During SEE of VIII semester of BE Program	R8	50	Committee consisting of HOD/Nominee + Project Coordinator + External Examiner

The evaluation criteria may vary marginally (maximum of 5%) from the perspective of different disciplines but the structure/stages of evaluation and allotted marks for each stage of evaluation in both 7th and 8th semesters must be same for all the branches across the institute.

R1. Synopsis presentation (Before the end of first month in VII semester of BE Program): Total Marks of 15

Evaluation criteria	Score/Marks			Total Marks	Evaluation By
	Poor (Needs improvement) (1)	Average (acceptable) (3)	Very good (Proficient) (5)		
Motivation and Rationale behind the work	Less motivated and has less desire to achieve a goal, accomplish a task, or work Need for the process /product which offers viable solutions to accomplish a work towards expectations in a challenging and interesting area is not good	Moderately motivated and has some interest to achieve a goal, accomplish a task, or work Need for the process /product which offers viable solutions to accomplish a work towards expectations in a challenging and interesting area is okay and acceptable	Highly motivated and desirous to achieve a goal, accomplish a task, or work Need for the process /product which offers viable solutions to accomplish a work towards expectations in a challenging and interesting area is good	15	Committee consisting of HOD/Nominee + Project Coordinator + Guide(s) Each will evaluate for 15 marks and average of all three is the marks awarded
Literature review	Less technical papers are reviewed and less relevant	Few technical papers are reviewed and moderately relevant	At least 3 technical papers from reputed journals are made and reviews are quite relevant to the project work		
Presentation	Slides contain some errors, Not legible, flow is okay, body language is minimal, Response to the audience questions and comments are not good	Slides are error free, flow is good, body language is acceptable, Responds to the audience questions and comments	Slides are error free, quite legible, flow is good, body language is good, Responds accurately to the audience questions and comments		

R2. Internal Evaluation (Before 15 days from the last working day of VII semester of BE Program): Total Marks of 15

Evaluation Criteria	Score/Marks			Total Marks	Evaluation By
	Poor (Needs Improvement) (1)	Average (Acceptable) (3)	Very good (Proficient) (5)		
Proposed design methodology	Division of problem into modules but improper selection of design approaches and design methodology and not properly justified	Division of problem into modules with proper selection of design approaches and design methodology but not properly justified	Division of problem into modules and good selection of design approaches, appropriate design methodology with proper justification	15	Committee consisting of HOD/Nominee + Project Coordinator + Guide(s) Each will evaluate for 15 marks and average of all three is the marks awarded
Preliminary/Conceptual Design work	Very less efforts are made towards preliminary and conceptual design works to accomplish the work	Efforts are made towards preliminary and conceptual design works to accomplish the work but some are not clear	Preliminary and conceptual design works are carried and are in proper direction to accomplish the project work		
Presentation and Report	Slides are not organized, and Question-answer is poor, report has errors and not systematic	Slides are good but not neatly arranged, delivery is good, Question-answer is average Report is not organized systematically	Slides are neat, delivery is good, Question-answer is very good, gestures and body languages are perfect Report is organized, and is according to the specified format References and citations are appropriate		

R3. Evaluation by the guide (In the last week of working days of VII semester): Total Marks of 20

Evaluation Criteria	Score/Marks			Total Marks	Evaluation By
	Poor (1)	Average (3)	Excellent (5)		
Objectives and Feasibility study	Many possible objectives are left out and very few are stated Design steps are not feasible to accomplish all the objectives	Some objectives are stated clearly and some possible objectives are left out Design steps are less feasible to accomplish all the objectives	All the objectives are clearly and neatly stated Design steps to be followed to solve the defined problem are feasible to accomplish all the objectives	20	Guide(s)
Survey and Problem identification	Topics are surveyed randomly and less relevant to societal and environmental problem	Topics are surveyed and not fully relevant to society and environment problem	Extensive survey is made and socially and environmentally relevant problem is identified		
Involvement in the work and ability to work in team	Less involved in the work	Would have involved still more	Sincerely involved in the work and very hard working and has good interest		
Individual Contribution and Peer/Guide interaction	Lesser involvement and contribution Rarely met the guide and met on guide's call	Contributed to the work to some extent Met the guide for interaction and sincere and obedient to the guide's call and suggestions	Good interaction and contributed in a big way Met the guide for interaction and sincere and obedient to the guide's call and suggestions More frequently met the guide for interaction and Sincere and obedient to the guide's call and suggestions		

R4: SEE Evaluation for Project Phase-I (During SEE of VII semester of BE Program): Total Marks of 50

Evaluation Criteria	Score/Marks				Total Marks	Evaluated by
	Needs improvement (Poor) (4)	Acceptable (Average) (6)	Satisfactory (Good) (8)	Proficient (Excellent) (10)		
Identification of Problem Domain and Detailed Analysis of Feasibility	Moderate explanation of the purpose and need of the project Explanation of the specifications and the limitations of the existing systems not very satisfactory; limited information	Average explanation of the purpose and need of the project; Moderate study of the existing systems; collects some basic information	Good explanation of the purpose and need of the project Collects a great deal of information and good study of the existing systems	Detailed and extensive explanation of the purpose and need of the project	50	HOD/nomination + Project coordinator + External examiner Each will evaluate for 50 marks and average of all three is the marks awarded
Objectives and Methodology of Project Proposal	Only some objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are not specified properly	Incomplete justification to the objectives proposed; Steps are mentioned but unclear; without justification to objectives	Good justification to the objectives; Methodology to be followed is specified but detailing is not done	All objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are clearly specified Detailed and extensive explanation of the specifications and the limitations of the existing systems		
Design Methodology	Partial division of problem into modules and inappropriate selection of computing framework Design methodology not defined properly	Division of problem into modules but inappropriate selection of computing framework Design methodology not defined properly	Division of problem into modules and good selection of computing framework Design methodology not properly justified	Division of problem into modules and good selection of computing framework Appropriate design methodology and properly justified		
Planning of Project Work	Time frame not properly specified	Time frame properly specified, but not being followed	Time frame properly specified but being followed partly	Time frame properly specified and being followed		
Presentation	Contents of presentations are not appropriate and not well arranged Very less eye contact and unclear voice	Contents of presentations are appropriate but not well arranged Eye contact with few people and unclear voice	Contents of presentations are appropriate but not well arranged Satisfactory demonstration, clear voice with good spoken language but eye contact not proper	Contents of presentations are appropriate and well arranged Proper eye contact with audience and clear voice with good spoken language		

R5: Project work progress review-I (Before the end of first month in VIII semester of BE Program): Total Marks of 15

Evaluation Criteria	Score/Marks				Total Marks	Evaluated by
	Needs improvement (Poor) (2)	Acceptable (Average) (3)	Satisfactory (Good) (4)	Proficient (Excellent) (5)		
Design methodology and planning of project work	Division of problem into modules and improper selection of computing framework Design methodology not properly justified Time schedule is not clear	Division of problem into modules and improper selection of computing framework Design methodology not properly justified Time schedule is specified	Division of problem into modules and good selection of computing framework Design methodology not properly justified, Time schedule is specified	Division of problem into modules and good selection of computing framework, Appropriate design methodology and proper justification Time frame properly specified	15	HOD (or nomination) + Project coordinator + Guide(s) Each will evaluate for 15 marks and average of all three is the marks awarded
Description of Concepts and Technical Details	Inappropriate explanation of the key concepts and poor description of the technical requirements of the project	Incomplete explanation of the key concepts and in-sufficient description of the technical requirements of the project	Complete explanation of the key concepts but in-sufficient description of the technical requirements of the project	Complete explanation of the key concepts and strong description of the technical requirements of the project		
Demonstration and presentation	Contents of presentations are not appropriate and Demonstration not satisfactory	Contents of presentations are appropriate but not well arranged, eye contact with few people and unclear Voice	Contents of presentations are appropriate but not well arranged, satisfactory demonstration, clear voice with good spoken language but eye contact not proper	Good demonstration of work so far carried-out, Contents of presentations are appropriate and well arranged, Proper eye contact with audience and clear voice with good spoken language		

R6: Project work progress review -II (Before 15 days from the last working day of VIII semester): Total Marks of 15

Evaluation Criteria	Score/Marks				Total Marks	Evaluated by
	Needs improvement (Poor) (2)	Acceptable (Average) (3)	Satisfactory (Good) (4)	Proficient (Excellent) (5)		
Incorporation of Suggestions made in the previous review	Some changes are made as per modifications suggested during previous evaluation	All major changes are made as per modifications suggested during previous evaluation	Changes are made as per modifications suggested during previous evaluation and good justification	Changes are made as per modifications suggested during the previous evaluation and new innovations added	15	HOD (or nomination) + Project coordinator + Guide(s) Each will evaluate for 15 marks and average of all three is the marks awarded
Discussion and Conclusion	Results are not presented properly, Project work is not summarized and concluded Future extensions in the project are not specified	Results presented are not much satisfactory, Project work summary and conclusion not very appropriate Future extensions in the project are not specified	Results are presented in good manner, Project work summary and conclusion not very appropriate Future extensions in the project are specified	Results are presented in very appropriate manner, Project work is well summarized and concluded, Future extensions in the project are well specified		
Demonstration and Presentation	Modules are not in proper working form that further leads to failure of integrated system, Contents of presentations are not appropriate and not well delivered Poor eye contact with audience and unclear voice	Modules are working well in isolation and properly demonstrated, Modules of project are not properly integrated, Contents of presentations are appropriate but not well delivered Eye contact with only few people and unclear voice	Each module working well and properly demonstrated, Integration of all modules not done and system working is not very satisfactory, Contents of presentations are appropriate and well delivered, Clear voice with good spoken language but less eye contact with audience	Each module working well and properly demonstrated, All modules of project are well integrated and system working is accurate, neatly presented with proper eye contact with audience and clear voice with good spoken language		

R7: Evaluation by the guide (In the last week of working days of VIII semester): Total Marks of 20

Evaluation Criteria	Score/Marks				Total Marks	Evaluated by
	Needs improvement (Poor) (2)	Acceptable (Average) (3)	Satisfactory (Good) (4)	Proficient (Excellent) (5)		
Technical Knowledge gained through project work	Poor knowledge and no awareness related to project	Lacks sufficient knowledge and Awareness	Fair knowledge and awareness related to the project	Extensive knowledge and awareness related to the project	20	Guide(s)
Regularity and Attendance	Irregular and inconsistent in work	Reports to the guide but lacks Consistency	Reports to the guide very often but not very consistent	Reports to the guide regularly and consistent in work		
Incorporation of Suggestions made in the previous review	All major changes are made as per modifications suggested during previous evaluation	All major changes are made as per modifications suggested during previous evaluation	Changes are made as per modifications suggested during previous evaluation and good justification	Changes are made as per modifications suggested during the previous evaluation and new innovations added		
Organization and structure of Project Report	Project report not prepared according to the specified format, References and citations are not appropriate	Project report is according to the specified format but some mistakes, Insufficient references and citations	Project report is according to the specified format, References and citations are appropriate but not mentioned well	Project report is according to the specified format, References and citations are appropriate and well mentioned		

R8: SEE Evaluation for Project Phase-II (During SEE of VIII semester of BE Program): Total Marks of 50

Evaluation Criteria	Score				Total Marks	Evaluation By
	Needs improvement (Poor) (2)	Acceptable (Average) (3)	Satisfactory (Good) (4)	Proficient (Excellent) (5)		
Presentation	Contents of presentations are not appropriate and not well delivered, Poor eye contact with audience and unclear voice	Contents of presentations are appropriate but not well delivered, Eye contact with only few people and unclear voice	Contents of presentations are appropriate and well delivered, Clear voice with good spoken language but less eye contact with audience	Contents of presentations are appropriate and well delivered, Proper eye contact with audience and clear voice with good spoken language	50	HOD/ nomination + Project coordinator + External Examiner Each will evaluate for 50 marks and average of all three will be taken
Designs and implementation	Proper design methodology is not followed resulting into poor design , No modern tools are used to implement, Work contributes very less to the world	Proper design methodology is followed, Design lacks, very less modern tools are used to implement, the work contributes to the world in little way	Proper design methodology is followed, Design is done but not perfect, few modern tools are used to implement, the work contributes to the world in some way	Proper design methodology is followed, Design is perfect, Modern tools are used to implement, the work contributes to the world in greater way		
Results and Demonstration	Some of the defined objectives are achieved Modules are not in proper working form that further leads to failure of integrated system	All defined objectives are achieved Modules are working well in isolation and properly demonstrated Modules of project are not properly integrated	All defined objectives are achieved and working well and demonstrated Integration of all modules not done and system working is not very satisfactory	All defined objectives are achieved and evident from the results Each module working well and properly demonstrated All modules of project are well integrated and system working is accurate		
Project report	Project report not prepared according to the specified format References and citations are not appropriate	Project report is according to the specified format but some mistakes In-sufficient references and citations	Project report is according to the specified format References and citations not mentioned well	Project report is according to the specified format References and citations are appropriate and well mentioned		
Viva - Voce	Answered few questions related to design, implementation and applications of project work	Answered some questions related to design, implementation and applications of project work	Answered 80% of the questions related to design, implementation and applications of project work	Answered all the questions related to design, implementation and applications of project work		