



Shri Vile Parle Kelavani Mandal's  
Dwarkadas J. Sanghvi College of Engineering  
(Autonomous College Affiliated to the University of Mumbai)

Scheme and detailed syllabus (DJ19)

Final Year B.Tech

in

Production Engineering

(Semester VII and VIII)

**Scheme for Final Year Undergraduate Program in Production Engineering : Semester VII (Autonomous)  
(Academic Year 2022-2023)**

Sr	Course Code	Course	Teaching Scheme				Semester End Examination (A)						Continuous Assessment (B)						Aggregate (A+B)	Credits earned	
			Theory (hrs.)	Practical (hrs.)	Tutorial (hrs.)	Credits	Duration	Theory	Oral	Practical	Oral & Pract	SEE Total (A)	Stage 1 Presentation(T	Stage 2 Presentation	Total (Stage1 & stage2)	Termwork					CA Total (B)
															Laboratory Work	Tutorial / Mini	Term Work				
1	DJ19PEC 701	Industrial Training & Project	--	5*8=40	--	20	--	--	100	--	--	100	50	100	150	--	--	150	300	400	20
			--	40	--	20	--	--	100	--	--	100	50	100	150	--	--	150	300	400	20

Prepared by

Checked by

Head of the Department

Principal

**Scheme for Final Year Undergraduate Program in Production Engineering : Semester VIII (Autonomous)  
(Academic Year 2022-2023)**

Sr	Course Code	Course	Teaching Scheme				Semester End Examination (A)						Continuous Assessment (B)						Aggregate (A+B)	Credits earned		
			Theory (hrs.)	Practical (hrs.)	Tutorial (hrs.)	Credits	Duration	Theory	Oral	Practical	Oral & Pract	SEE Total (A)	Term Test 1 (TT1)	Term Test 2 (TT2)	Avg (TT1 & TT2)	Term work						CA Total (B)
																Laboratory Work	Tutorial / Mini	Term Work Total				
1	DJ19PEC801	Automation & Control Engineering.	3	--	--	3	3	75	--	--	--	75	25	25	25	--	--	--	25	100	3	4
	DJ19PEL801	Automation & Control Engineering. Lab.	--	2	--	1	--	--	--	25	25	--	--	--	--	--	25	25	50	1		
2	DJ19PEC802	Computer Aided Engineering.	3	--	--	3	3	75	--	--	--	75	25	25	25	--	--	--	25	100	3	4
	DJ19PEL802	Computer Aided Engineering Lab.	--	2	--	1	--	--	--	25	25	--	--	--	--	--	25	25	50	1		
3	DJ19PEC803	Engineering Economics Finance Costing and Accounting.	3	--	--	3	3	75	--	--	--	75	25	25	25	--	--	--	25	100	3	3
4	DJ19PED08011	Advances in Automobile Engineering.	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100	3	3
	DJ19PED08012	Product Design and Development.	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100		
	DJ19PED08013	World Class Manufacturing.	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100		
	DJ19PED08014	Plant Engineering.	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100		
	DJ19PED08015	Energy Management & Audit.	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100		
	DJ19PED08016	Sales & Marketing Management	3	--	--	3	--	75	--	--	--	75	25	25	25	--	--	--	25	100		
5	DJ19PEIO801X	Institute Level Elective – 1/2	3	--	--	3	3	75	--	--	--	75	25	25	25	--	--	--	25	100	3	3
			<b>15</b>	<b>4</b>	<b>0</b>	<b>17</b>	--	<b>375</b>	--	--	<b>50</b>	<b>425</b>	<b>125</b>	<b>125</b>	<b>125</b>	--	--	<b>50</b>	<b>175</b>	<b>600</b>	<b>17</b>	

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Checked by

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Program: Final Year Production Engineering					Semester: VIII					
Course: Industrial Training and Project					Course Code: DJ19PEC701					
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Stage 1 Presentation	Stage 2 Presentation	Total	
								-		
				Laboratory Examination			Term work			Total Term work
				Oral	Practical	Oral & Practical	Project Report	Tutorial / Mini project / presentation / Journal	150	
-	5*8=40	-	20	100	-	-		-		

### Objectives:

1. To correlate with the lessons learnt in theory and actual practices followed in the industries.
2. To give exposure to an industrial environment/discipline.
3. To familiarize with the need for a coordinated effort of various persons at different levels in different departments for achieving the set goals and targets.

### Outcomes: Learner will be able to...

1. Get familiarized with various technological trends, approaches and applications along with managerial exposure.
2. Appreciate and realize the size and scale of operations in Industry.
3. Apply the knowledge in problem solving.
4. Demonstrate an understanding of various constraints in industry.
5. Demonstrate the scope, functions and job responsibilities in various departments of an organization.
6. Develop a positive attitude while dealing in professional manner.

**Guidelines for Evaluation/Assessment:**

The total duration for each presentation shall be maximum 30 minutes, inclusive of 20 minutes for presentation and 10 minutes for discussion. 50 marks for stage I and 100 marks for stage II to be awarded based on the points furnished below and as per the discretion of the internal project guide.

1. Contents of the presentation.
2. Presentation skills.
3. Interest taken, personal involvement and contribution.
4. Headway/progress made in the project execution.

**Evaluation/Assessment of the Term Work**

1. Introduction, Acknowledgements, references.	}	
2. Company background/ activities.		15
3. Training areas / Training details.		
4. Synopsis / Abstract of the Project.		15
5. General presentation, neatness and accuracy of the data furnished.		25
6. Technical contents of the report with data / observations, graphs, drawings, etc.		35
7. Quality of work carried out & details furnished based on personal observations/involvement.		40
8. Results/ Conclusion.		20
		Total - 150

**Note: Report shall be prepared using University of Mumbai approved Guidelines, as applicable.**

<b>Program: Final Year Production Engineering</b>				<b>Semester: VIII</b>					
<b>Course: Automation &amp; Control Engineering.</b>				<b>Course Code: DJ19PEC801</b>					
<b>Course: Automation &amp; Control Engineering. Lab.</b>				<b>Course Code: DJ19PEL801</b>					
Teaching Scheme (Hours / week)				Evaluation Scheme					Total marks (A+ B)
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
				Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
3	2	-	4	10	15	25	15	10	25
									50

**Objectives:**

1. To acquaint with basic concepts of industrial automation involving pneumatic and hydraulic controls.
2. To familiarize with the elements of electro-pneumatic interface with control systems.
3. To learn about the application of microprocessors and microcontrollers.
4. To design, implement and operate automatic control systems.

**Outcomes:** Learner will be able to...

1. Understand the need of automation and apply automation techniques to manufacturing set-ups.
2. Design and develop hydraulic control circuits of medium complexity.
3. Design and develop pneumatic control circuits of medium complexity.
4. Understand the fundamentals of the control system.
5. Understand the application of microprocessors and microcontrollers.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Unit</b>	<b>Duration</b>
<b>01</b>	<p><b>Automation:</b> Definition; Automation in production systems; Automation principles and strategies; Basic elements of an automated system; Advanced automation functions; Levels of automation; Types of automation; Benefits and Impact of Automation in Manufacturing and Process Industries.</p>	<b>05</b>
<b>02</b>	<p><b>Hydraulic Control Systems:</b> Overview of different types of valves, Actuators and Accumulators used in Oil hydraulic circuits, their applications and their ISO symbols. Basic hydraulic circuits involving linear and rotary actuators (No sequential circuits). Fundamental concepts of digital and servo hydraulic controls. Comparison between proportional, digital and servo hydraulic control systems.</p>	<b>09</b>
<b>03</b>	<p><b>Pneumatic control systems:</b> Overview of different types of valves and Actuators in Pneumatics, their applications and their ISO symbols. Design of Pneumatic circuits using Cascade method and Shift register method (up to 3 cylinders). Design of Electro-Pneumatic Circuits using single solenoid and double solenoid valves with and without grouping.</p>	<b>09</b>
<b>04</b>	<p><b>Fundamentals of Control System:</b> Control system concepts, classification of control systems, Block diagram reduction method for finding transfer function of a complex system, Stability analysis by Routh's array and Root Locus Method.</p>	<b>07</b>
<b>05</b>	<p><b>Digital logic:</b> Number systems; Logic Gates; Boolean Algebra; Simplification of Boolean equations using Karnaugh Maps. <b>Microprocessors and Microcontrollers(Only basic understanding and applications)</b> Concept of Microprocessor based control and its application, Parts of a Microprocessor system with block diagram. Difference between a Microprocessor and a Microcontroller. <b>Sensors and Transducers:</b> Fundamentals of displacement, position and Proximity Sensors; Velocity and Motion Sensors; Force and Fluid Pressure Sensors; Liquid level and Flow sensors; Temperature and light Sensors; Control of stepper motors.</p>	<b>09</b>

**List of Laboratory Experiments:**

1. Designing & Simulation of two pneumatic circuits on any compatible software.
2. Designing & Simulation of two electro-pneumatic circuits on any compatible software.
3. Two Pneumatic circuits Setup and execution on experimental kit.
4. Two Electro-Pneumatic circuits Setup and execution on experimental kit.
5. Introduction to mathematical programming softwares like Matlab or Scilab. Introduction to the GUI working; basic codes; introduction to the graphing tools; Implementation of root locus.

## **Evaluation Scheme:**

### ***Semester End Examination (A):***

#### *Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

### ***Continuous Assessment (B):***

#### *Theory:*

1. Consisting of **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

### ***Laboratory (Term Work)***

Term work shall consist of at least 1 assignment on each module from syllabus and minimum 05 experiments as per above list to be conducted and presented with inferences.

The distribution of marks for term work shall be as follows:

Laboratory work (Experiment/ programs and journal):	10 M
Assignments:	10 M
Attendance (Theory and Practical):	05 M

The final certification and acceptance of term work ensures the satisfactory performance of laboratory work and minimum passing in the term work.

Oral examination will be based on the entire syllabus including, the practicals performed during laboratory sessions for the Max Marks of 25 marks.

### **Books Recommended:**

1. *Automation, Production Systems, and Computer-integrated Manufacturing (3rd Edition)*, by Mikell P. Groover, PHI Learning Private Limited, New Delhi.
2. *Pneumatic Controls*, by Joji P., Wiley India Pvt. Ltd.
3. *Principles Of Control Systems*, by U.A. Bakshi, V.U. Bakshi, Technical Publications Pune.
4. *Vickers Industrial Hydraulics Manual (3rd Edition)*, Vickers Inc.; Maumee, OH. *Hydraulic and Pneumatic Controls (2nd Edition)*, by R. Srinivasan, Vijay Nicole Imprints Pvt. Ltd. Chennai.
5. *Introduction to Hydraulics and Pneumatics*, by S. Ilango and V. Soundararajan, PHI Learning Pvt. Ltd. New Delhi.

<b>Program: Final Year Production Engineering</b>				<b>Semester: VIII</b>						
<b>Course: Computer Aided Engineering.</b>				<b>Course Code: DJ19PEC802</b>						
<b>Course: Computer Aided Engineering Lab.</b>				<b>Course Code: DJ19PEL802</b>						
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work			
				Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation / Journal	Total Term work	
3				10	15	25	15	10	25	50

**Objectives:**

1. To introduce the concepts of computer aided engineering for design & manufacture and familiarize them with mathematical basis of computer graphics.
2. To impart knowledge on computer graphics, which are used routinely in diverse areas like science, engineering, medicine etc.
3. The aim is to provide the students with knowledge of the finite element method that will be of use in different manufacturing areas and to provide a foundation for further study
4. To introduce the concept of Computer integrated manufacturing, and familiarize them with various automated material handling techniques.

**Outcomes:** Learner will be able to...

1. Understand software configuration of graphic packages.
2. Understand use of Computer graphics in design.
3. Identify proper modeling techniques for geometric modeling
4. Solve physical and engineering problems with emphasis on Structural and Thermal Engineering applications.
5. Understand the concept of Computer Integrated Manufacturing.
6. Understand the concept of automated material handling and its methodologies.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Unit</b>	<b>Duration</b>
<b>01</b>	<p><b>Computer Aided Design:</b>  <b>Introduction :</b> Need and Utility of CAD systems in industry, Product Cycle, Definition of CAD tools based on their Constituents and Implementation in a design environment.  <b>CAD Hardware:</b> Types of systems, system considerations, I/O devices, Hardware Integration &amp; Networking.</p>	<b>04</b>
<b>02</b>	<p><b>Computer Graphics :</b>  Pixel plotting, Scan conversions of lines &amp; circuits, 2D &amp; 3D transformation, 2D Viewing and clipping. Parallel Projection. Elementary treatment of Hidden lines and surfaces. Cubic spines Bezier curves &amp; B- spines, Animation and Color models.</p>	<b>08</b>
<b>03</b>	<p><b>Solid Modeling :</b>  Types of representation of solid models, interactive tools available with solid modeling software's. Introduction to surface modeling.  <b>CAD DATA Exchange :</b> File Structure and format of IGES,STEP and DXF</p>	<b>07</b>
<b>04</b>	<p><b>FEA:</b>  Introduction, Stress and Equilibrium, Boundary Condition, Strain – Displacement Relations, Stress Strain Relation, Potential Energy. One Dimensional Problem: Finite Element Modelling, Coordinate Potential Energy Approach, Galerkin Approach, Assembly of Global Stiffness Matrix, Properties of Stiffness Matrix, Finite Element Equations.  Trusses: Introduction, 2D Trusses, Assembly of Global Stiffness Matrix.</p>	<b>08</b>
<b>05</b>	<p><b>CIM :</b>  Introduction, Evolution, Objectives, CIM Hardware and Software, CIM Benefits, Nature and role of the elements of CIM, Identifying CIM needs, Data base requirements of CIM, Role of CAD/CAM in CIM, Obstacles to Computer Integrated Manufacturing, Concept of the future CIM systems, Socio -techno-economic aspects of CIM.  <b>Automated Material handling systems:</b>  Flexible manufacturing system: Components, layouts, advantages Automated guided vehicles: advantages, types, guidance systems Group technology (GT): Part families, Parts Classification and Coding Automated storage/ Retrieval system (AS/RS) Concept of “Ghost” factory.</p>	<b>12</b>

**List of Laboratory Experiments:**

1. Programming for transformations
2. Solid modeling using any 3D modeling software
3. Part programming and part fabrication on CNC trainer (Turning / Milling)
4. Geometrical optimization of any mechanical component using computer aided engineering concepts. (Shape optimization)

Any other experiment based on syllabus may be included, which would help the learner to understand topic/concept.

Evaluation Scheme:

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Laboratory (Term Work)**

Term work shall consist of at least 1 assignment on each module from syllabus and minimum 05 experiments as per above list to be conducted and presented with inferences.

The distribution of marks for term work shall be as follows:

Laboratory work (Experiment/ programs and journal):	10 M
Assignments:	10 M
Attendance (Theory and Practical):	05 M

The final certification and acceptance of term work ensures the satisfactory performance of laboratory work and minimum passing in the term work.

Oral examination will be based on the entire syllabus including, the practicals performed during laboratory sessions for the Max Marks of 25 marks.

**Books Recommended:**

1. *CAD/CAM* by Groover and Zimmers.
2. *CAD Principles and Applications* by Barr, Krimger and Lazaer .
3. *CAD/CAM Handbook* by Teicholz.
4. William M Neumann and Robert F.Sproul “*Principles of Computer Graphics*”, *Mc Graw Hill Book Co. Singapore, 1989.*
5. Donald Hearn and M. Pauline Baker “*Computer Graphics*”, *Prentice Hall, Inc., 1992.*
6. Foley, Wan Dam, Feiner and Hughes – *Computer graphics principles & practices, Pearson Education – 2003.*
7. Reddy, J.N, “*An Introduction to the Finite element Method*”, *McGraw Hill, 1985.*
8. Rao, “*Finite Element Method in Engineering*”, *Pergammon Press, 1989.*
9. *CAD / CAM* by P.N. Rao (Tata-Mcgraw Hill)
10. *Mathematical and Procedural Elements for computer graphics* by Roger and Adams.
11. *Computer Graphics* by Hearn and Baker (PHI).
12. *Computer Graphics* by Plastock and Gordon (Schaums outline series).
13. *FEM* by Fagan 1
14. *FEM* by J. N. Reddy (McGraw Hill).
15. *A first course in FEM* by daryl L. Logon (Cengage).
16. *Concepts and applications of FEA* by Cook, Malkus (Jhon-wiley).
17. *Mastering CAD – CAM* by Ibarahim Zeid (Tata-Mcgraw-Hill).

<b>Program: Final Year Production Engineering</b>					<b>Semester : VIII</b>					
<b>Course: Engineering Economics Finance Costing and Accounting.</b>					<b>Course Code: DJ19PEC803</b>					
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work		Total Term work	
				Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	--	
				--	--	--	--	--	--	

**Objectives:**

1. To acquaint with the concepts of Micro and Macro Economics.
2. To comprehend the need, definition, functions and economic significance of financial institutions and markets.
3. To familiarize with the concept of Fiscal and Monetary Policy.
4. To acquaint with financial statements and Annual Reports of industries.
5. To familiarize the students with cost records / statements.

**Outcomes:** learner will be able to:

1. Correlate various micro and macro-economic variables.
2. Illustrate Economic policies and their implications.
3. Get familiarized with the roles played by various financial institutions/banks.
4. Get exposure to various business strategies.
5. Get familiarized with Accounting and costing practices

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>1</b>	Introduction Definition of Economy, Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost. Economics, its scope and importance. Introduction to Micro and Macro Economics and their comparison.	<b>04</b>
<b>2</b>	<b>Micro Economics Consumer's Behavior:</b> meaning of utility, marginal utility and law of Diminishing Marginal Utility. Conditions of consumer's equilibrium using marginal utility analysis utility, law of demand and relation between law of demand & law of diminishing marginal utility. Producer's Behavior: law of supply, variation in supply, Types of elasticity of supply. <b>Types of Market:</b> perfect competition, pure competition, Monopoly.	<b>04</b>
<b>3</b>	<b>Macro Economics Concept of National Income:</b> Circular flow of income, Distinction between Gross and Net National Income. Different Methods of Measuring National Income, Definition of Money, Functions of Money, Value of Money and Different concepts of Money. Economic Policy: Monetary, Income and Fiscal Policies. Functions of Central Bank, Functions of Commercial Banks credit Creation, Credit Control Methods, Theory of Inflation, Concepts of Inflation, Effects of Inflation and Anti-inflationary policies.	<b>04</b>
<b>4</b>	<b>Accounting Mechanics, Process and system:</b> Introducing Book Keeping and Record Maintenance, The concept of Double entry and fundamental principles, Journal, Ledger, Trial Balance and Final accounts. Financial Analysis, Ratio Analysis and comparative balance sheet. <b>Management Accounting:</b> Understanding of Financial Statements (Overview), Interpreting Financial statements (overview).	<b>12</b>
<b>5</b>	<b>Cost and Management Accounting</b> Introduction to cost, Types of cost, Treatment of Overheads, Unit Costing (Cost Sheet), Joint Product Costing, Process Costing, Marginal Costing, Cost Volume Profit Analysis and Decision Making. Budgetary Controls, Standard Costing, concept and Importance of Depreciation and Methods of Depreciation.	<b>15</b>

**Evaluation Scheme:****Semester End Examination (A):***Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):***Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Books Recommended:**

1. *Managerial and Cost Accounting*, Larry M. Walther , Christopher J. Skousen
2. *Corporate Finance Principles and Practices*, Denzil Watson & Tong Heads, Financial Time Pitman Publisher.
3. *Strategic Financial Management*, Robert Alan Hill
4. *Basics of Accounting & Information Processing The Accounting Cycle*, Larry M. Walther , Christopher J. Skousen
5. *Introduction to Managerial Accounting*, Larry M. Walther , Christopher J. Skousen
6. *Essentials of Microeconomics*, Krister Ahlersten
7. *Essentials of Macroeconomics*, Peter Jochumzen
8. *Banking: An Introduction*, Dr. AP Faure, Rhodes University
9. *Financial System: An Introduction*, Dr AP Faure, Rhodes University
10. *Central Banking & Monetary Policy: An Introduction*, Dr. AP Faure, Rhodes University

<b>Program: Final Year Production Engineering</b>					<b>Semester : VIII</b>					
<b>Course: Advances in Automobile Engineering.</b>					<b>Course Code: DJ19PEDO8011</b>					
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work		Total Term work	
				Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	--	
				--	--	--	--	--	--	

**Objectives:**

1. Study basic principles of actual automobile systems.
2. Study important systems in an automobile.
3. Study recent and modern trends in automobile sector.

**Outcomes:** Learner will be able to...

1. Understand various systems in an automobile.
2. Understand the concept of transmission system and its components.
3. Understand the concepts of steering system and its application.
4. Understand the concepts of brakes, suspension, wheel and balancing etc.
5. Understand the electric system used in automobile.
6. Understand principle of operation, construction and applications of various sensors used in modern automobile along with recent trends.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>01</b>	<p><b>Vehicle Performance:</b> Types of Engines used in automobile, their characteristics and selection, resistance to motion of vehicle, air , rolling, and gradient resistance.</p> <p><b>Chassis types and structure types:</b> chassis layout, power plant location, Types, Open, Semi integral and integral bus structure.</p> <p><b>Body Engineering</b> Importance of Body design, Materials for body construction-Styling forms Coach and bus body style, layouts of passenger cars, Bus and truck bodies.</p> <p><b>Aerodynamic drag –</b> Aerodynamic lifts and pitching moments, Side force, Yawing moments and rolling moments.</p>	<b>06</b>
<b>02</b>	<p><b>Introduction Transmissions:</b> Necessity of gear box, Sliding mesh, Constant mesh, Synchromesh and epicyclic gear box, Overdrives and hydrodynamic torque converter, CVT, DSG, DCT, AMT, Trouble shooting and remedies.</p> <p><b>Drive line:</b> Propeller shaft and universal joints, types and construction, different types of universal joints and constant velocity joints.</p> <p><b>Live axle and differential:</b> Final drive, spiral, bevel, Hypoid and worm drives, Types of live axles, semi, three quarter and full floating axles. Necessity of differential, Conventional and non-slip differential, Trouble shooting and remedies.</p> <p><b>Steering and Front axles</b> Steering geometry, Steering requirements, Steering linkages and steering gears, over steer and under steer, Cornering power, Reversibility of steering gears, wheel alignment, wheel balancing, Power steering mechanisms, components, types. Types of front axles and their constructions. Trouble shooting and remedies</p>	<b>08</b>
<b>03</b>	<p><b>Brakes</b> Requirement of brake, Classification of brakes, Mechanical, Hydraulic, Pneumatic, Electro and vaccum brakes. Disc brakes, Braking of front wheel, Rear wheel and four wheel brakes, Brake trouble shooting. Introduction to antilock braking system (ABS).</p> <p><b>Suspension</b> Objects of suspension, Basic requirements, Air suspension and its features, Independent suspension, Forces acting in independent suspension, Sprung and un-sprung mass, Pitching, rolling and bouncing, Shock absorbers.</p> <p><b>Wheels and Tyres</b> Requirements of wheels and tyres, Constructional features, Types of tyres, Inflation Pressure and its importance, Application to ride and stability, Trouble shooting and remedies</p>	<b>10</b>
<b>04</b>	<p><b>Electrical system Battery:</b> Types of battery, Lead-Acid, Alkaline, ZEBRA, Sodium Sulphur and Swing, Ratings, charging, Maintenance and testing of Lead-Acid battery.</p> <p><b>Starting system:</b> Requirements, Various torque terms used, Starter motor drives; Bendix, Follo through, Barrel, Rubber compression, Compression Spring, Friction Clutch, Overrunning Clutch, Dyer. Starter motor solenoids and switches, Glow plugs.</p> <p><b>Alternator:</b> Principle of operation, Construction, Working, Rectification from AC to DC.</p>	<b>06</b>

<b>05</b>	<p><b>Recent trends in Automobiles</b>  Electronic Control module (ECM), operating modes of ECM ( closed loop and open loop) Inputs required and output signals from ECM, Electronic Spark control, Air Management system, Idle speed control. Construction, working &amp; application of temperature sensors, inductive sensors, Position sensors (rotary, linear). Hot wire and thin film air flow sensors, vortex flow/turbine fluid sensors, Optical sensor, Oxygen sensors, Light sensors, methanol sensors ,Rain sensor, New developments in the sensor technology</p>	<b>09</b>
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**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Books Recommended:**

1. *Automotive Mechanics*, William Cruose & Donald L. Anglin, Tata McGraw Hill
2. *Automotive Mechanics* , Joseph Heitner, East-West press pvt .Ltd
3. *The Automobile Engineering*, T. R. Banga & Nathu Singh, Khanna Publishers
4. *The Automobile*, Harbans Singh Reyat, S. Chand & Co.
5. *Automobile Engineering*, R. K. Rajput, Laxmi Publication
6. *Basic Automobile Engineering*, C.P.Nakra, Dhanpat Rai Publishing CO.
7. *Automobile Engineering*, Kirpal Singh Vol I & II, Standard publishers Distributors, Delhi
8. *Automobile Engineering*, K. K. Jain & R.B. Asthana, Tata Mcgraw Hill
9. *Automotive Mechanics*, S. Srinivasan, Tata Mcgraw Hill
10. *Automobile Engineering*, Vol I & II, R.K. Mohanty, Standard Book House
11. *Automobile Electrical and Electronics*, Tom Denton
12. *Vehicle Body Engineering*, J Pawlowski, Century publisher.
13. *Computerised Engine Control*, Dick King, Delmar publisher.
14. *System Approach to Automobile Technology*, Jack Erjavec, Cengage Learning
15. *Light & Heavy Vehical technology*, M. J. Nunney, Elsevier.

Prepared by

Checked by

Head of the Department

Principal

<b>Program: Final Year Production Engineering</b>					<b>Semester : VIII</b>				
<b>Course: Product Design and Development.</b>					<b>Course Code: DJ19PEDO8012</b>				
Teaching Scheme (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
3	--	--	3	Laboratory Examination			Term work		--
				Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	
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**Objectives:**

1. To acquaint with various approaches in designing and developing new products.
2. To familiarize with various software solutions for designing and developing products.
3. To familiarize with modern approaches like concurrent engineering, product life cycle management, robust design, rapid prototyping / rapid tooling, etc.

**Outcomes:** Learner will be able to...

1. Design and develop products right from the conceptual level.
2. Demonstrate concept of computer aided product design approach.
3. Illustrate various modern approaches like concurrent engineering, product life cycle management, robust design, rapid prototyping / rapid tooling.
4. Analyze products based on ergonomics and aesthetic aspects.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>01</b>	<p><b>1.1. Introduction:</b> Definition of product design, Classification of products, Design by evolution, Design by innovation, Product Mix, Various phases in product development and Design, Morphology of Design, Considerations in product design, Product specifications.</p> <p><b>1.2. Conceptual Design:</b> Market research, Generation , Selection and Embodiment of concept, Product Architecture, Customer centric product designing</p> <p><b>1.3. Creativity:</b> Role of creativity in problem solving, Vertical and lateral thinking, Brain storming, Synectics, Group working dynamics, Adaptation to changing scenarios in economics, social, cultural and technological fronts, Anticipation of new needs and aspirations.</p>	<b>06</b>
<b>02</b>	<p><b>2.1. Design for manufacturing (DFM):</b> Guidelines and Methodology, Producibility requirements, Accuracy and Precision requirements, Strength considerations in Design: Criteria and objectives, Designing for uniform strength, Designing for stiffness and rigidity, Practical ideas for material saving in design - ribs, corrugations, rim shapes, bosses, laminates, etc.</p> <p><b>2.2. Design for forged and Cast components:</b> Design for Sheet Metal processed components, powder metallurgical components, Expanded metals and wire forms</p> <p><b>2.3. Design for Assembly (DFA):</b> DFA Index, Analysis of assembly requirements, Standardization, Ease of Assembly and disassembly, Design for bolted, welded and riveted components, Design for hinge and snap fit assemblies, maintenance, consideration of handling and safety, Modular concepts.</p> <p><b>2.4. Other DFX Principles:</b> Designs for Maintainability, Safety, Reliability, Sustainable Design</p>	<b>10</b>
<b>03</b>	<p><b>3.1. Product Ergonomics:</b> Anthropometry, Environmental conditions, thermal, noise, vibration, displays, illusions, Psycho and psychological aspects in design, Man-machine information exchange.</p> <p><b>3.2. Product Aesthetics:</b> Visual awareness, Form elements in context of product design, Concepts of size, shape and texture, Introduction to colour and colour as an element in design, Colour classifications and dimensions of colour, Colour combinations and colour dynamics, Interaction / communication of colours, Psychological aspects of colours, generation of products forms with analogies from nature.</p>	<b>09</b>
<b>04</b>	<p><b>4.1. Value Engineering:</b> Product value and its importance, Value analysis job plan, Steps to problem solving and value analysis, Value analysis tests, Value Engineering idea generation check list, Material and process selection in value engineering, Cost reduction, case studies and exercises.</p>	<b>05</b>

<b>05</b>	<p><b>5.1. Product Graphics:</b> Graphics composition and layout, Use of grids in graphics composition, Study of product graphics and textures</p> <p><b>5.2. Software solutions:</b> Software for drafting, modeling, assembly, detailing, CAM interfacing, Rapid tooling/rapid prototyping, etc.</p> <p><b>5.3. Modern Applications:</b> Concurrent Engineering, Robust Design, Additive Manufacturing/Rapid Prototyping, Product Life Cycle Management techniques and application areas.</p>	<b>09</b>
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**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Books Recommended:**

1. *Product Design & Development*, Karl Ulrich, Steven Eppinger,
2. *Design Fundamentals*, R. G. Scott.
3. *Design methods inter science*, Jomes.
4. *Creative Engineering Design*, Buhl H. R.
5. *The Science of Engineering Design*, Holt, Hill Percy H.
6. *Ergonomics*, Merilyn Joyce, Ulrika Waller Steiner.
7. *Human Factors in Engineering & Design*, 4th edition
8. *Human Engineering Guide & Equipment Design*, Morgon C. T. & Others
9. *Design for Production*, Baldwin E. W. & Niebel B. W. Edwin, Homewood Illinois.
10. *Industrial design of plastic products*, Gordon, 2003
11. *Plastics Engineered Product Design*, Rosato, 2001.
12. John Stark, — *Product Lifecycle Management: Paradigm for 21st Century Product Realisation*, Springer-Verlag, 2004. ISBN: 1852338105
13. Fabio Giudice, Guido La Rosa, Antonino Risitano, — *Product Design for the environment-A life cycle approach*, Taylor & Francis 2006, ISBN: 0849327229
14. Saaksvuori Antti, Immonen Anselmie, — *Product Life Cycle Management*, Springer, Dreamtech, ISBN: 3540257314
15. Michael Grieve, — *Product Lifecycle Management: Driving the next generation of lean thinking*, Tata McGraw Hill, 2006, ISBN: 0070636265

<b>Program: Final Year Production Engineering</b>				<b>Semester: VIII</b>						
<b>Course: World Class Manufacturing</b>				<b>Course Code: DJ19PEDO8013</b>						
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>						
				<b>Semester End Examination Marks (A)</b>		<b>Continuous Assessment Marks (B)</b>			<b>Total Marks (A+ B)</b>	
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>	<b>100</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>	
<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>	<b>-</b>
				<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / Presentation / Journal</b>		
				<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>		

**Objectives:**

1. To demonstrate the WCM policies and procedures to produce quality products, on time and at the lowest operational costs possible.
2. To aware how to stay one step ahead of the competition in global markets.
3. To prepare mind-set geared towards consistently delivering exceptional and expectations-beating manufacturing performance.

**Outcomes:** Learner will be able to...

1. Identify the challenges in world class manufacturing.
2. Compare different competitive manufacturing strategies.
3. Apply different quality tools to improve product and process design.
4. Explain how to enhance employee involvement in manufacturing.
5. Determine different methods to monitor performance in WCM

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>1</b>	<p><b>Historical Perspective</b>  <b>World class organizations:</b> Meaning of world class, Competitiveness and Performance measures, Criteria for world class organizations in Manufacturing, Competing in World markets, Review of frameworks in World Class Manufacturing (WCM),  <b>Models for manufacturing excellence:</b> Schonberger, Halls, Gunn &amp; Maskell models and Business Excellence  <b>Indian Scenario:</b> Leading Indian companies towards world class manufacturing – Task Ahead</p>	<b>08</b>
<b>2</b>	<p><b>Benchmark, Bottlenecks and Best Practices</b>  Concepts of benchmarking, Bottleneck &amp; best practices, Best performers, Gaining competitive edge through world class manufacturing, Value added manufacturing, Value Stream mapping, Eliminating different types of waste, Lean Thinking (Toyota Production System), Six Sigma, Theory of Constraints</p>	<b>08</b>
<b>3</b>	<p><b>System and Tools for WCM for improving Product &amp; Process Design</b>  Continuous process improvement, Process capability, SQC, Statistical Process Control, Quality Function Deployment (QFD), Customer satisfaction, Seven Basic Quality Tools, FMS, Poka-Yoke, 5-S, Optimizing Procurement &amp; stores practices, Total Productive maintenance and Visual Control.</p>	<b>10</b>
<b>4</b>	<p><b>Human Resource Dimensions in WCM – WCM Strategy Formulation</b>  <b>Adding value to the organization:</b> Organizational learning, techniques of removing Root cause of problems, People as problem solvers, new organizational structures. Commitment and leadership, Employee involvement  <b>Associates:</b> Facilitators, Teams man ship, Motivation and reward in the age of continuous improvement.</p>	<b>08</b>
<b>5</b>	<p><b>Characteristics of WCM Companies</b>  <b>Performance indicators</b> like POP, TOPP and AMBITE systems.  <b>Other features of WCM :</b> Supply Chain Management &amp; key issues in SCM, Agile Manufacturing, Green Manufacturing, Role of Information system in WCM, Introduction to Knowledge management, Study of various performance measures in world class organization.</p>	<b>08</b>

## **Evaluation Scheme:**

### ***Semester End Examination (A):***

#### *Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

### ***Continuous Assessment (B):***

#### *Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

### ***References Books:***

1. *World Class Manufacturing - Strategic Perspective* by B.S. Sahay , KBC Saxena , Ashish Kumar Macmillan India Publication, 2000, New Delhi
2. *Making Common Sense Common Practice – Models for manufacturing excellence* by Ron Moore - Butterworth–Heinemann Publication 2002
3. *The Toyota Way to Continuous Improvement: Linking Strategy and Operational Excellence to Achieve Superior Performance* by Jeffrey K. Liker, James K. Franz- McGraw-Hill Education 2011
4. *The Toyota Way, Second Edition: 14 Management Principles from the World's Greatest Manufacturer* by Jeffrey K. Liker - McGraw-Hill Education Publication 2020
5. *Operations Management for Competitive Advantage* by Richard B. Chase, Nicholas J. Aquilano , F. Robert Jacobs - McGraw-Hill/Irwin Publication 2007
6. *Making Common Sense Common Practice- Models for Manufacturing Excellence* by Ron Moore Butterworth–Heinemann Publication 2004
7. *Encyclopedia of Technology and Innovation Management* by V. K. Narayanan, Gina Colarelli O'Connor- Wiley Publication 2010
8. *Just in Time Manufacturing* by M. G. Korgaonker -Macmillan Publishers India Limited 2000
9. *The Machine That Changed the World* by James P. Womack, Daniel T. Jones, Daniel Roos- Simon & Schuster UK Publication 2008

<b>Program: Final Year Production Engineering</b>						<b>Semester: VIII</b>			
<b>Course: Plant Engineering.</b>						<b>Course Code: DJ19PEDO8014</b>			
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>				<b>Total marks (A+ B)</b>	
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
				<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Pract ical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentat ion/ Journal</b>	
3				-	-	-	-	-	

**Objectives:**

1. To acquaint with concepts of plant engineering and various plant organizing functions.
2. To familiarize with various types of maintenance work and systems in plant.
3. To acquaint with various methods of pollution, noise and vibration control.
4. To acquaint with concept and significance of sustainable approaches in plants.
5. To get conversant with approaches in material handling and plant safety

**Outcomes:** Learner will be able to...

1. Plan & design plant layouts and organization for plant engineering.
2. Demonstrate selection and use of material handling systems in plant engineering.
3. Demonstrate various operational and safety practices including fire safety.
4. Illustrate concepts of pollution, noise and vibration control.
5. Apply sustainable approaches and practices.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>01</b>	<p><b>INTRODUCTION:</b> Plant Engineering functions, Organization for Plant Engineering, Plant layout – considerations and significance, plant utilities, utility structure, ventilation, heating, air-conditioning, exhaust systems, sanitation and house-keeping, communication and IT network.</p> <p><b>MATERIAL HANDLING AND PLANNING:</b> Material handling Equipment – Trolleys, Conveyers, fork lifts and cranes, Addressing material handling problems, Material Handling containerization – Automatic storage and Retrieval system. Use of AGU and Robots in material handling, Handling of powder and liquids – chutes and piping systems, vacuum conveying, Designing material handling projects.</p>	<b>10</b>
<b>02</b>	<p><b>POLLUTION CONTROL:</b> Types of industrial pollutants and pollutions – Solid, liquid, gaseous and noise pollutions. Regulatory standards and requirements, detection measurements and instrumentation, emission safety, emission controls, collection, storage and disposal of industrial waste, liquid waste, effluents–treatments and disposal. Managing poisonous vapors &amp; gases- systems for handling and disposal, Operational noise and control of plant noise, Human response and noise, vibration and vibration control.</p>	<b>07</b>
<b>03</b>	<p><b>PLANT SAFETY:</b> Significance of safety, organization for safety – Man, Machine and tool safety, Importance of house-keeping in safety. Safety tools and gadgets, Safety norms and safety practices. Safety monitoring and implementation of safe practices- use of safety posters and colors, plant fire hazard- Causes and prevention, Design and planning for fire safety, fire detectors and alarm system, special suppression systems, Firefighting-Accessibility for fire engines, firefighting gadgets – their use and maintenance. Training of employees on plant safety and fire hazards.</p>	<b>07</b>
<b>04</b>	<p><b>PLANT MAINTENANCE:</b> Organization for maintenance, Classification of maintenance – Brake down maintenance, Preventive Maintenance and Total Productive Maintenance, Maintenance Planning and condition monitoring. Lubrication and Lubricants, types of Lubricants and selection, Lubricant systems, Basics of Corrosion and Corrosion prevention</p>	<b>07</b>
<b>05</b>	<p><b>SUSTAINABILITY:</b> Introduction to sustainability and Sustainable approaches in plants, Approaches for carbon emission reduction carbon foot prints and carbon credits, Energy storage and energy conservation technologies, Enhancing energy efficiency through energy saving processes and design. Energy management and energy audits.</p>	<b>07</b>

## **Evaluation Scheme:**

### ***Semester End Examination (A):***

#### *Theory:*

3. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
4. Total duration allotted for writing the paper is 3 hrs.

### ***Continuous Assessment (B):***

#### *Theory:*

4. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
5. Total duration allotted for writing each of the paper is 1 hr.
6. Average of the marks scored in both the tests will be considered for final grading.

## **References Books:**

1. Rosaler, R. C. —*Standard Hand Book of Plant Engineering*, 3rd Edition, McFraw Hill, 2002.
2. R. Keith Mobley. Lindley R. Higgins and Darrin J. Wikoff, - *Maintenance Engineering Hand book* , 7th Edition, McGraw Hill Professional, 2008.

<b>Program: Final Year Production Engineering</b>					<b>Semester: VIII</b>				
<b>Course: Energy Audit and Management</b>					<b>Course Code: DJ19PEDO8015</b>				
Teaching Scheme (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)		
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.
				75			25	25	25
				Laboratory Examination			Term work		Total Term work
				Oral	Practical	Oral & Pract ical	Laboratory Work	Tutorial / Mini project / presentat ion/ Journal	
3	-	-	3	-	-	-	-	-	-

### Objectives:

1. To understand the importance energy security for sustainable development and the fundamentals of energy conservation.
2. To identify and describe the basic principles and methodologies adopted in energy audit of an utility
3. To introduce performance evaluation criteria of various electrical and thermal installations to facilitate the energy management.
4. To relate the data collected during performance evaluation of systems for identification of energy saving opportunities.

### Outcomes: Learner will be able to...

1. To identify and describe present state of energy security and its importance.
2. To identify and describe the basic principles and methodologies adopted in energy audit of an utility.
3. To describe the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
4. To describe the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
5. To analyze the data collected during performance evaluation and recommend energy saving measures.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>01</b>	<b>Energy Scenario:</b> Present Energy Scenario, Energy Pricing, Energy Sector Reforms, Energy Security, Energy Conservation and its Importance, Energy Conservation Act-2001 and its Features. Basics of Energy and its various forms, Material and Energy balance.	<b>04</b>
<b>02</b>	<b>Energy Audit Principles:</b> Definition, Energy audit- need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy performance, Matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution. Elements of monitoring & targeting, Energy audit instruments. <b>Financial analysis techniques:</b> Simple payback period, NPV, Return on investment (ROI) Internal rate of return (IRR).	<b>08</b>
<b>03</b>	<b>Energy Management and Energy Conservation in Electrical System:</b> Electricity billing, Electrical load management and maximum demand Control; Power factor improvement, Energy efficient equipments and appliances, star ratings. Energy efficiency measures in lighting system, Lighting control: Occupancy sensors, daylight integration, and use of intelligent controllers. Energy conservation opportunities in water pumps, industrial drives, induction motors, motor retrofitting, soft starters, variable speed drives.	<b>10</b>
<b>04</b>	<b>Energy Management and Energy Conservation in Thermal Systems:</b> Review of different thermal loads; Energy conservation opportunities in: Steam distribution system, Assessment of steam distribution losses, Steam leakages, Steam trapping, Condensate and flash steam recovery system. General fuel economy measures in Boilers and furnaces, Waste heat recovery, use of insulation-types and application. HVAC system: Coefficient of performance, Capacity, factors affecting Refrigeration and Air Conditioning system performance and savings opportunities.	<b>10</b>
<b>05</b>	<b>Energy Performance Assessment:</b> On site Performance evaluation techniques, Case studies based on: Motors and variable speed drive, pumps, HVAC system calculations. Lighting System: Installed Load Efficacy Ratio (ILER) method. <b>Energy conservation in Buildings:</b> Energy Conservation Building Codes (ECBC): Green Building, LEED rating, Application of Non-Conventional and Renewable Energy Sources	<b>07</b>

## **Evaluation Scheme:**

### ***Semester End Examination (A):***

#### *Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

### ***Continuous Assessment (B):***

#### *Theory:*

1. Consisting of **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

## **Books Recommended:**

1. *Handbook of Electrical Installation Practice*, Geofry Stokes, Blackwell Science.
2. *Designing with light: Lighting Handbook*, By Anil Valia, Lighting System.
3. *Energy Management Handbook*, By W.C. Turner, John Wiley and Sons.
4. *Handbook on Energy Audits and Management*, edited by A. K. Tyagi, Tata Energy Research Institute (TERI).
5. *Energy Management Principles*, C.B. Smith, Pergamon Press.
6. *Energy Conservation Guidebook*, Dale R. Patrick, S. Fardo, Ray E. Richardson, Fairmont Press.
7. *Handbook of Energy Audits*, Albert Thumann, W. J. Younger, T. Niehus, CRC Press.
8. [www.energymanagertraining.com](http://www.energymanagertraining.com)
9. [www.bee-india.nic.in](http://www.bee-india.nic.in)

<b>Program: Final Year Production Engineering</b>					<b>Semester : VIII</b>					
<b>Course: Sales and Marketing Management.</b>					<b>Course Code: DJ19PEDO8016</b>					
Teaching Scheme (Hours / week)				Evaluation Scheme						
				Semester End Examination Marks (A)			Continuous Assessment Marks (B)			Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory			Term Test 1	Term Test 2	Avg.	
				75			25	25	25	100
				Laboratory Examination			Term work		Total Term work	
3	--	--	3	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal		--
				--	--	--	--	--	--	

**Objectives:**

1. To make conversant with various principles and strategies of sales and marketing.
2. To acquaint with methodology for product pricing policies and distribution channels.
3. To make aware of promotional policies, advertising strategies and principles of market research.

**Outcomes:** Learner will be able to...

1. Illustrate various selling strategies, pricing strategies and methodology of product positioning.
2. Get exposure about customer behavior and their implications in marketing.
3. Develop capability to assess, analyze and measure sales and marketing performance.
4. Get exposure to promotional policies and importance of advertising.
5. Evaluate effectiveness of advertising.

<b>Detailed Syllabus: (unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
<b>01</b>	Definition of marketing, Understanding marketing, Sales, Company orientations, Journey from sales to marketing, New economy, Environmental forces, Marketing task, Marketing concepts and tools, Major drivers of the economy, Changing of business practices, Changing of marketing practices, E-business	<b>06</b>
<b>02</b>	Customer value and satisfaction, Organizational culture, Attracting and retaining customers, Cost of lost customer, Total customer satisfaction, Customer relationship management, Survey of customer needs, Consumers, Organizational and Government buyers.	<b>06</b>
<b>03</b>	Differentiation, Segmenting, Targeting, Positioning, Marketing decision support system, Product life cycle, Portfolio management, Customer perception of product features, New product development.	<b>07</b>
<b>04</b>	Competition, Market research, Management strategies, 4Ps of product marketing and 7Ps of service marketing, Product policies, Product brands, Services offering, Pricing, Customer perceived value, Distribution channels, Retailing, Marketing Plan and implementation, Market testing.	<b>08</b>
<b>05</b>	Marketing Organization, Selection of marketing staff, Specialized Training, Role of a salesman, Routine management, Salaries and incentives, Marketing intelligence, Marketing performance. Customer focus, Advertising, Sales promotion, Motivation research, Consumer behavior, Buying decision process, Competitive strategies, Audit of customer satisfaction.	<b>12</b>

### **Evaluation Scheme:**

#### ***Semester End Examination (A):***

##### *Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

#### ***Continuous Assessment (B):***

##### *Theory:*

1. Consisting **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Books Recommended:**

1. *Marketing Management: A South Asian Perspective*, Philip Kotler , Abraham.
2. *Koshy* , Kevin Lane Keller , Mithileswar Jha.
3. *Marketing, A Managerial Introduction*, J. C. Gandhi.
4. *Principles and Practice of Marketing in India*, C. B. Mamoria, Raman Lal Joshi.
5. *Principles of Marketing and Salesmanship*, J. C. Sinha.
6. *Marketing management*, V. S. Ramaswamy, S. Namakumari.
7. *Indian Cases in Marketing*, M. D. Kakade.
8. *Advertising: Art and Ideas*, Dr. G. M. Rege.
9. *Advertising*, Chakaraborty.

Prepared by

Checked by

Head of the Department

Principal

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>					<b>Semester: VII</b>					
<b>Course: Product Life Cycle Management</b>					<b>Course Code: DJ19ILO7011</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>						
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>			<b>Total marks (A+ B)</b>
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>	
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>	
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>	<b>--</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>		
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	

**Pre-requisite:** Knowledge of basic concepts of Management.

**Objectives:**

1. To familiarize the students with the need, benefits and components of PLM
2. To acquaint students with Product Data Management & PLM strategies
3. To give insights into new product development program and guidelines for designing and developing a product
4. To familiarize the students with Virtual Product Development

**Outcomes:** On completion of the course, learner will be able to:

1. Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
2. Illustrate various approaches and techniques for designing and developing products.
3. Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
4. Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Introduction to Product Lifecycle Management (PLM):</b> Product Lifecycle Management (PLM), Need for PLM, Product Lifecycle Phases, Opportunities of Globalization, Pre-PLM Environment, PLM Paradigm, Importance &amp; Benefits of PLM, Widespread Impact of PLM, Focus and Application, A PLM Project, Starting the PLM Initiative, PLM Applications</p> <p><b>PLM Strategies:</b> Industrial strategies, Strategy elements, its identification, selection and implementation, Developing PLM Vision and PLM Strategy, Change management for PLM</p>	<b>10</b>
<b>2</b>	<p><b>Product Design:</b> Product Design and Development Process, Engineering Design, Organization and Decomposition in Product Design, Typologies of Design Process Models, Reference Model, Product Design in the Context of the Product Development Process, Relation with the Development Process Planning Phase, Relation with the Post design Planning Phase, Methodological Evolution in Product Design, Concurrent Engineering, Characteristic Features of Concurrent Engineering, Concurrent Engineering and Life Cycle Approach, New Product Development (NPD) and Strategies, Product Configuration and Variant Management, The Design for X System, Objective Properties and Design for X Tools, Choice of Design for X Tools and Their Use in the Design Process</p>	<b>08</b>
<b>3</b>	<p><b>Product Data Management (PDM):</b> Product and Product Data, PDM systems and importance, Components of PDM, Reason for implementing a PDM system, financial justification of PDM, barriers to PDM implementation</p> <p><b>Virtual Product Development Tools:</b> For components, machines, and manufacturing plants, 3D CAD systems and realistic rendering techniques, Digital mock-up, Model building, Model analysis, Modelling and simulations in Product Design, Examples/Case studies</p>	<b>08</b>
<b>4</b>	<p><b>Integration of Environmental Aspects in Product Design:</b> Sustainable Development Design for Environment, Need for Life Cycle Environmental Strategies, Useful Life Extension Strategies, End-of-Life Strategies, Introduction of Environmental Strategies into the Design Process, Life Cycle Environmental Strategies and Considerations for Product Design.</p>	<b>08</b>
<b>5</b>	<p><b>Life Cycle Assessment and Life Cycle Cost Analysis:</b> Properties, and Framework of Life Cycle Assessment, Phases of LCA in ISO Standards, Fields of Application and Limitations of Life Cycle Assessment, Cost Analysis and the Life Cycle Approach, General Framework for LCCA, Evolution of Models for Product Life Cycle Cost Analysis</p>	<b>08</b>

**Books Recommended:**

*Text books:*

1. Product Lifecycle Management: Paradigm for 21st Century Product Realization, John Stark, Springer-Verlag, 2004.
2. Product Design for the environment-A life cycle approach, Fabio Giudice, Guido La Rosa, Antonino Risitano, Taylor & Francis 2006.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
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*Reference Books:*

1. Product Life Cycle Management, Saaksvuori Antti, Immonen Anselmie, Springer, Dreamtech.
2. Product Lifecycle Management: Driving the next generation of lean thinking, Michael Grieve, Tata McGraw Hill, 2006.
3. Product Life-Cycle Management: Geometric Variations, François Villeneuve, Luc Mathieu, Max Giordano, Wiley, 2010.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Management Information System</b>				<b>Course Code: DJ19ILO7012</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
				<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. The course is blend of Management and Technical field.
2. Discuss the roles played by information technology in today's business and define various technology architectures on which information systems are built
3. Define and analyze typical functional information systems and identify how they meet the needs of the firm to deliver efficiency and competitive advantage
4. Identify the basic steps in systems development

**Outcomes:** Learner will be able to...

1. Explain how information systems Transform Business
2. Identify the impact information systems have on an organization
3. Describe IT infrastructure and its components and its current trends
4. Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
5. Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Foundation Concepts:</b> Information Systems in Business, Functional Area Information System, The Components of Information Systems, Impact of IT on organizations and society, Organizational Strategy, Information systems for strategic advantage.	<b>05</b>
<b>2</b>	<b>Information Technologies:</b> Hardware and Software <b>Computer Systems:</b> End User and Enterprise Computing <b>Computer Peripherals:</b> Input, Output, and Storage Technologies <b>Application Software:</b> End User Applications <b>System Software:</b> Computer System Management <b>Data Resource Management:</b> Technical Foundations of Database Management, Managing Data Resources, Big data, Data warehouse and Data Marts, Knowledge Management <b>Networks:</b> The Networked Enterprise (Wired and wireless), Pervasive computing, Cloud Computing models	<b>08</b>
<b>3</b>	<b>MIS Tools and applications for Decision making:</b> ERP and ERP support of Business Process Reengineering, <b>Business intelligence (BI):</b> Managers and Decision Making, BI for Data analysis and Visualization <b>Artificial Intelligence Technologies in Business</b>	<b>08</b>
<b>4</b>	<b>Security and Ethical Challenges:</b> Security, Ethical, and Societal Challenges of IT Security Management of Information Technology	<b>06</b>
<b>5</b>	<b>Social Computing (SC):</b> Web 2.0 and 3.0, SC in business-shopping, Marketing, Operational and Analytic CRM, E-business and E-commerce – B2B B2C, Mobile commerce.	<b>07</b>
<b>6</b>	<b>Information System within Organization:</b> Acquiring Information Systems and Applications: Various System development life cycle models. <b>Enterprise and Global Management of Information Technology:</b> Managing Information Technology, Managing Global IT.	<b>08</b>

**Books Recommended:**

*Reference Books:*

1. Management Information Systems, 11<sup>th</sup> edition by James A O'Brien, George M., Ramesh Behl.
2. Kelly Rainer, Brad Prince, Management Information Systems, Wiley.
3. K.C. Laudon and J.P. Laudon, Management Information Systems: Managing the Digital Firm, 10<sup>th</sup> Ed., Prentice Hall, 2007.
4. D. Boddy, A. Boonstra, Managing Information Systems: Strategy and Organization, Prentice Hall, 2008

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>						
<b>Course: Operations Research</b>				<b>Course Code: DJ19ILO7013</b>						
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>						
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>			<b>Total marks (A+ B)</b>
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>	
				75			25	25	25	
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>	<b>--</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>		
				--	--	--	--	--	--	

**Pre-requisites:** Basic Knowledge of Algebra, Probability and Statistics.

**Objectives:**

1. To formulate a real-world decision problem as a mathematical programming model.
2. To learn the mathematical tools that are employed to solve mathematical programming models.

**Outcomes:** On completion of the course, learner will be able to:

1. **Convert** a real-world problem in to a Linear Programming Problem and **analyse** the solution obtained using Simplex method or other algorithms.
2. **Identify** real-world problems as Transportation Problem and Assignment Problem and **Solve** the decision problem by choosing appropriate algorithm.
3. **Identify** the decision situations which vary with time and **analyse** them using principle of dynamic programming to real life situations.
4. **Explain** reasons of formation of queues, classify various queuing systems and **apply** parameters defined for various queuing systems for decision making in real life situations.
5. **Understand** the concept of decision making in situation of competition and **recommend** strategies in case of two-person zero sum games.
6. **Describe** concept of simulation and **apply** Monte Carlo Simulation technique to systems such as inventory, queuing and **recommend** solutions for them.
7. **Understand** need for right replacement policy and **determine** optimal replacement age.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Introduction to Operations Research:</b> Concept of decision making. Definition of OR. Formulation of decision problem as OR model, Concept of Optimization, <b>Linear Programming Problem:</b> Mathematical Formulation. Finding optimal solution - Graphical method, Simplex Method, Big M-method, Two Phase Method. Duality, Primal – Dual construction, Symmetric and Asymmetric Dual. Dual Simplex Method.	10
<b>2</b>	<b>Assignment Problems:</b> Mathematical Formulation, Finding optimal solution - Hungarian Method <b>Transportation problem:</b> Mathematical Formulation, Finding initial basic feasible solution – Northwest corner rule, row minima, column minima, least cost method and Vogel’s approximation method. Optimality test: the stepping stone method and MODI method. Improving the solution.	08
<b>3</b>	<b>Dynamic Programming:</b> Bellman’s Principle of optimality - Applications of dynamic programming- Employment smoothening problem, capital budgeting problem, shortest path problem, cargo loading problem	06
<b>4</b>	<b>Queuing Models:</b> Characteristics of queuing models. Single Channel – Single and multi phase servers, Poisson arrivals, exponential service time - with infinite population and finite population models – with infinite and finite capacity. Multichannel – Single phase server - Poisson arrivals, exponential service time with infinite population. <b>Game Theory:</b> Introduction. Minimax & Maximin Criterion and optimal strategy. Solution of games with saddle points, rectangular games without saddle points - 2 x 2 games, dominance principle. Approximate methods - Iterative method, m x 2 & 2 x n games -Graphical method and method of sub-games. Expressing game as LPP.	10
<b>5</b>	<b>Simulation:</b> Definition. Types of simulation models. Monte Carlo simulation technique. Applications of simulation - Inventory and Queuing problems. Simulation Languages. <b>Replacement Models:</b> Replacement of items that deteriorate with time - when money value is not counted and counted, Replacement of items that fail suddenly – individual and group replacement policy.	08

**Note:** Educator is expected to introduce relevant software available for solving various mathematical models.

**Books Recommended:**

*Text books:*

1. Operations Research, Sharma J. K., Trinity Press
2. Operations Research, Gupta P. K., Hira D. S., S. Chand Limited

*Reference Books:*

1. Operations Research - An Introduction; Taha, H.A.; Prentice Hall

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
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2. Operations Research: Principles and Practice; Ravindran, A, Phillips, D. T and Solberg, J. J.; John Willey and Sons
3. Introduction to Operations Research; Hiller, F. S. and Liebermann, G. J.; Tata McGraw Hill
4. Operations Research Principles and Practice; Pradeep Prabhakar Pai; Oxford University Press
5. Operations Research, R. Panneerselvam, PHI Publications.
6. Operations Research, A. M. Natarajan, P. Balasubramani, A. Tamilarasi, Pearson Education.
7. Operations Research; Kanti Swarup, P. K. Gupta and Man Mohan; Sultan Chand & Sons

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Cyber Security and Laws</b>				<b>Course Code: DJ19ILO7014</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
				<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. To understand and identify different types cybercrime and cyber offences.
2. To recognized Indian IT Act 2008 and its latest amendments
3. To learn various types of security standards compliances

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the different types of cybercrime and security issues E Business.
2. Analyses different types of cyber threats and techniques for security management.
3. Explore the legal requirements and standards for cyber security in various countries to regulate cyberspace.
4. Impart the knowledge of Information Technology Act and legal frame work of right to privacy, data security and data protection.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Introduction to Cybercrime:</b>            Cyber Crime, Cyber Law, Cyber Security, History of Cyber Crime, Hacking, Data Theft, Cyber Terrorism, Virus &amp; Worm's, Email Bombing, Pornography, online gambling, Forgery, Web Defacements, Web Jacking, Illegal online Selling, Cyber Defamation, Software Piracy, Electronics/ Digital Signature, Phishing, Password Cracking, Key loggers and Spywares, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing Identity Theft (ID Theft)</p> <p><b>Cyber offenses:</b>            How criminal plan the attacks, Social Engineering, Cyber stalking, Cyber café and Cybercrimes, Botnets, Attack vector</p>	<b>12</b>
<b>2</b>	<p><b>Cyber Threats Analysis</b>            Knowledge of Dynamic and Deliberate Targeting            Knowledge of Indications and Warning            Knowledge of Internal Tactics to Anticipate and/or, Emulate Threat Capabilities and Actions            Knowledge of Key Cyber Threat Actors and their Equities            Knowledge of Specific Target Identifiers and Their Usage</p> <p><b>Cyber Security Management</b>            Knowledge of Emerging Security Issues, Risks, and Vulnerabilities</p>	<b>08</b>
<b>3</b>	<p><b>Electronic Business and legal issues</b>            Evolution and development in Ecommerce, Policy Frameworks for Secure Electronic Business, paper vs paper less contracts, E-Commerce models- B2B, B2C, E security. E-Payment Mechanism; Payment through card system, E-Cheque, E-Cash, E-Payment Threats &amp; Protections, Security for E-Commerce.</p>	<b>06</b>
<b>4</b>	<p><b>Indian IT Act</b>            Cyber Crime and Criminal Justice, Penalties, Adjudication and Appeals Under the IT Act, 2000, IT Act. 2008 and its Amendments</p> <p><b>Security aspect in cyber Law</b>            The Contract Aspects in Cyber Law , The Security Aspect of Cyber Law, The Intellectual Property Aspect in Cyber Law ,The Evidence Aspect in Cyber Law ,The Criminal Aspect in Cyber Law</p>	08
<b>5</b>	<p><b>Security Industries Standard Compliances</b>            IT Security v/s IT Compliance, Cyber Security Standards, critical security controls for cyber security, GRC (Governance, Risk Management, and Compliance), SOX, GLBA, HIPAA, ISO/IEC 27001, NIST Cyber Security Framework (CSF), PCI-DSS.            OWASP Top Ten Project, GDPR (General Data Protection Regulation), NIST (National Institute of Standards and Technology), CIS Controls (Center for Internet Security Controls)</p>	08

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**Semester VII (Autonomous)**  
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**Books Recommended:**

*Reference Books and Material:*

1. Nina Godbole, Sunit Belapure, Cyber Security, Wiley India, New Delhi
2. The Indian Cyber Law by Suresh T. Vishwanathan; Bharat Law House New Delhi
3. The Information Technology Act, 2000; Bare Act- Professional Book Publishers, New Delhi.
4. E-Commerce Security and Privacy", Anup K. Ghosh, Springer Science and Business Media, 2012
5. Izzat Alsmadi , The NICE Cyber Security Framework Cyber Security Intelligence and Analytics, Springer
6. Cyber Law & Cyber Crimes, Advocate Prashant Mali; Snow White Publications, Mumbai
7. Nina Godbole, Information Systems Security, Wiley India, New Delhi
8. Kenneth J. Knapp, Cyber Security & Global Information Assurance Information Science Publishing.
9. William Stallings, Cryptography and Network Security, Pearson Publication
10. Websites for more information is available on : The Information Technology ACT, 2008-TIFR : <https://www.tifrh.res.in>
11. Website for more information, A Compliance Primer for IT professional:  
<https://www.sans.org/reading-room/whitepapers/compliance/compliance-primer-professionals-33538>

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Personal Finance Management</b>				<b>Course Code: DJ19ILO7015</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Pre-requisites:** Basic Knowledge of Algebra, Probability and Statistics.

**Objectives:**

1. To create awareness and educate consumers on access to financial services.
2. To make the students understand the basic concepts, definitions and terms related to direct taxation.
3. To help the students compute the Goods and Service Tax (GST) payable by a supplier after considering the eligible input tax credit.
4. To familiarise the students with microfinance for accelerating the expansion of local microbusinesses.

**Outcomes:** On completion of the course, learner will be able to:

1. Use a framework for financial planning to understand the overall role finances play in his/her personal life.
2. Compute income from salaries, house property, business/profession, capital gains and income from other sources.
3. Compute the amount of CGST, SGST and IGST payable after considering the eligible input tax credit.
4. Understand how Microfinance can help in financial inclusion.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>01</b>	<p><b>Overview of Indian Financial System:</b> Characteristics, Components and Functions of Financial System. Financial Instruments and Financial Markets, Financial inclusion.</p> <p><b>Introduction to Personal Finance</b>            Person Financial Planning in Action, Money Management Skills, Taxes in Your Financial Plan, Savings and Payment Services.            Consumer Credit: Advantages, Disadvantages, Sources and Costs.</p>	<b>07</b>
<b>02</b>	<p><b>Personal Financial Management</b>  <b>Loans:</b> Home, Car, Education, Personal, Loan against property and Jewel loan.  <b>Insurance:</b> Types of Insurance – ULIP and Term; Health and Disability Income Insurance, Life Insurance.  <b>Investment:</b> Investing Basics and Evaluating Bonds, Investing in Stocks and Investing in Mutual Funds, Planning for the Future.</p>	<b>07</b>
<b>03</b>	<p><b>Income Tax</b>  <b>Income Tax Act Basics-</b> Introduction to Income Tax Act, 1961  <b>Heads of Income and Computation of Total Income and Tax Liability-</b> Heads of Income and Computation of Total Income under various heads, Clubbing Provisions, Set off and Carry forward of Losses, Deductions, Assessment of Income and tax liability of different persons.  <b>Tax Management, Administrative Procedures and ICDS -</b> TDS, TCS and Advance Tax Administrative Procedures, ICDS.</p>	<b>08</b>
<b>04</b>	<p><b>Goods and Services Tax</b>            GST Constitutional framework of Indirect Taxes before GST (Taxation Powers of Union &amp; State Government); Concept of VAT: Meaning, Variants and Methods; Major Defects in the structure of Indirect Taxes prior to GST; Rationale for GST; Structure of GST (SGST, CGST, UTGST &amp; IGST); GST Council, GST Network, State Compensation Mechanism, Registration.  <b>Levy and Collection of GST</b>            Taxable event- "Supply" of Goods and Services; Place of Supply: Within state, Interstate, Import and Export; Time of supply: Valuation for GST- Valuation rules, taxability of reimbursement of expenses; Exemption from GST: Small supplies and Composition Scheme: Classification of Goods and Services</p>	<b>10</b>
<b>05</b>	<p><b>Introduction to Micro – finance</b>            Micro-Finance: Definitions, Scope &amp; Assumptions, Types of Microfinance, Customers of Micro-finance, Credit Delivery Methodologies, SHG concept, origin, Formation &amp; Operation of Self Help Groups (SHGs).  <b>Models in Microfinance -</b> Joint Liability Groups (JLG), SHG Bank Linkage Model and GRAMEEN Model: Achievements &amp; Challenges,  <b>Institutional Mechanism</b>            Current Challenges for Microfinance, Microfinance Institutions (MFIs): Constraints &amp; Governance Issues, Institutional Structure of Microfinance in India :NGO-MFIs, NBFC-MFIs, Co-operatives, Banks, Microfinance Networks and Associations; Demand &amp; Supply of Microfinance Services in India, Impact assessment and social assessments of MFIs,</p>	<b>10</b>

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

**Books Recommended:**

*Reference Books:*

1. Banking and Financial Sector Reforms in India , by Asha Singh, M.S. Gupta, Serials Publication.
2. Indian Banking Sector: Essays and Issues (1st) , by M.S. Gupta & J.B. Singh, Serials Publication.
3. Basics Of Banking & Finance , by K.M. Bhattacharya O.P. Agarwal , Himalaya Publishing House
4. Agricultural Finance And Management, by S. Subba Reddy , P. Raghu Ram .
5. The Indian Financial System And Development , by Dr.Vasant Desai, Himalaya Publishing House; Fourth Edition
6. Income Tax Management , Simple Way of Tax Management, Tax Planning and Tax Saving , By Sanjay Kumar Satapathy
7. Direct Tax System Income Tax by Dr. R. K. Jain, SBPD Publications.
8. Simplified Approach to GST Goods and Services Tax, By S K Mishra , Educreation Publishing.
9. Introduction To Microfinance , By Todd A Watkins , World Scientific Publishing Company

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Consisting **One Class Tests for 25 marks** based on approximately 50% of contents and one case study with presentations for 25 Marks.
2. Total duration allotted for writing test paper is 1 hr.
3. Average of the marks scored in the tests and case study will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Energy Audit and Management</b>				<b>Course Code: DJ19ILO7016</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. To understand the importance of energy security for sustainable development and the fundamentals of energy conservation.
2. To identify and describe the basic principles and methodologies adopted in energy audit of a utility
3. To introduce performance evaluation criteria of various electrical and thermal installations to facilitate the energy management.
4. To relate the data collected during performance evaluation of systems for identification of energy saving opportunities.

**Outcomes:** On completion of the course, learner will be able to:

1. To identify and describe present state of energy security and its importance.
2. To identify and describe the basic principles and methodologies adopted in energy audit of a utility.
3. To describe the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
4. To describe the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
5. To analyze the data collected during performance evaluation and recommend energy saving measures.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>01</b>	<b>Energy Scenario:</b> Present Energy Scenario, Energy Pricing, Energy Sector Reforms, Energy Security, Energy Conservation and its Importance, Energy Conservation Act-2001 and its Features. Basics of Energy and its various forms, Material and Energy balance.	<b>05</b>
<b>02</b>	<b>Energy Audit:</b> Definition, Energy audit- need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy performance, matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution. Elements of monitoring & targeting, Energy audit instruments. Technical and economic feasibility, Classification of energy conservation measures. Safety considerations during energy audit. <b>Financial analysis techniques:</b> Simple payback period, NPV, Return on investment (ROI) Internal rate of return (IRR).	<b>10</b>
<b>03</b>	<b>Energy Management and Energy Conservation in Electrical System:</b> Electricity billing, Electrical load management and maximum demand Control; Power factor improvement, Energy efficient equipments and appliances, star ratings. Energy efficiency measures in lighting system, lighting control: Occupancy sensors, daylight integration, and use of intelligent controllers. Energy conservation opportunities in water pumps, compressor, fan and blower. industrial drives, induction motors, motor retrofitting, soft starters, variable speed drives.	<b>10</b>
<b>04</b>	<b>Energy Management and Energy Conservation in Thermal Systems:</b> Review of different thermal loads; Energy conservation opportunities in: Steam distribution system, Steam leakages, Steam trapping, Condensate and flash steam recovery system. Waste heat recovery, use of insulation- types and application. Energy conservation opportunities in: Boiler system. Refrigeration system and HVAC system.	<b>10</b>
<b>05</b>	<b>Energy conservation in Buildings:</b> Energy Conservation Building Codes (ECBC): Green Building, LEED rating, Application of Non-Conventional and Renewable Energy Sources, Energy sources and energy management in electric vehicles.	<b>07</b>

**Books Recommended:**

*Reference Books:*

1. Handbook of Electrical Installation Practice, Geofry Stokes, Blackwell Science.
2. Designing with light: Lighting Handbook, By Anil Valia, Lighting System.
3. Energy Management Handbook, By W.C. Turner, John Wiley and Sons.
4. Handbook on Energy Audits and Management, edited by A. K. Tyagi, Tata Energy Research Institute (TERI).
5. Energy Management Principles, C.B. Smith, Pergamon Press.
6. Energy Conservation Guidebook, Dale R. Patrick, S. Fardo, Ray E. Richardson, Fairmont Press.
7. Handbook of Energy Audits, Albert Thumann, W. J. Younger, T. Niehus, CRC Press.
8. [www.energymanagertraining.com](http://www.energymanagertraining.com)
9. [www.bee-india.nic.in](http://www.bee-india.nic.in)

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Consisting of **Two Compulsory Class Tests for 25 marks**, First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>					<b>Semester: VII</b>					
<b>Course: Disaster Management and Mitigation Measures</b>					<b>Course Code: DJ19ILO7017</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>						
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>			<b>Total marks (A+ B)</b>
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>	
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>	
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>	<b>--</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>		
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	

**Objectives:**

1. To provide basic understanding hazards, disaster and various types and categories of disaster occurring around the world.
2. To identify extent and damaging capacity of a disaster.
3. To study and understand the means of losses and methods to overcome /minimize it.
4. To understand roles and responsibilities of individual and various organization during and after disaster.
5. To appreciate the significance of GIS, GPS in the field of disaster management.
6. To understand the emergency government response structures before, during and after disaster.

**Outcomes:** On completion of the course, learner will be able to:

1. Know natural as well as manmade disaster and their extent and possible effects on the economy.
2. Know the institutional framework and organization structure in India for disaster management and get acquainted with government policies, acts and various emergency laws.
3. Get to know the simple dos and don'ts in such extreme events and build skills to respond accordingly.
4. Understand the importance of disaster prevention and various mitigation measure with the exposure to disasters hotspots across the globe.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>General Information about Disaster:</b>  Brief concept of Hazards, definition and types of Disasters – Natural, Man-made, and hybrid, Groups of Disasters- Natural and Technological, global Scenario, Significance of studying various aspects of disasters, effects of disasters, India’s vulnerability to disasters, Impact of disaster on National development.  Study of Natural disasters:  Flood, drought, cloud burst, Earthquake, Landslides, Avalanches, Volcanic eruptions, Mudflow, Cyclone, Storm, Storm Surge, climate change, global warming, sea level rise, ozone depletion etc.  Study of Human/Technology Induced Disasters:  Chemical, Industrial and Nuclear disasters, Internally displaced persons, road and train accidents Fire Hazards, terrorism, militancy, Role of growing population and subsequent industrialization, urbanization and changing lifestyle of human beings in frequent occurrences of manmade disasters.</p>	<b>10</b>
<b>2</b>	<p><b>Disaster Management:</b>  Brief Introduction, Disaster management cycle, Evolution of Disaster and Disaster management in India, Disaster management acts, policies and guidelines, laws of emergencies etc.  Prior, During and Post disaster management activities:  (Preparedness, strengthening emergency centers, Logistics, optimum resource management, emergency response and relief, Training, Public awareness, Research, Reconstruction of essential services and livelihood restoration.</p>	<b>08</b>
<b>3</b>	<p><b>Institutional framework and Mechanism for disaster management in India:</b>  Institutions in India for dealing with various disasters, Organizational structure, functions and responsibilities of National Institute of Disaster Management (NIDM) and National disaster management authority (NDMA) in India, roles and responsibilities of central and state government during and after disaster, NGO’s involved in disasters and their task, Jobs carried out by armed forces.  Financial Relief During disaster (State, National and International Disaster Assistance)</p>	<b>08</b>
<b>4</b>	<p><b>Disaster risk reduction and Mitigation Measures:</b>  Need of disaster prevention and mitigation, mitigation guiding principles, challenging areas, structural and non-structural measures for disaster risk reduction.  Mitigation measures for flood, earthquake, cyclone monitoring, air quality, water quality, climate change, land use, winter storms and aquatic biology etc.  Use of information management, GIS, GPS and remote sensing Mitigation measure.  Do’s and don’ts in case of disasters and effective implementation of relief aids.</p>	<b>08</b>
<b>5</b>	<p><b>Case studies on disaster (National /International):</b>  Case study discussion of Hiroshima – Nagasaki (Japan), India – Tsunami (2004) , Bhopal gas tragedy, Kerala and Uttarakhand flood disaster, Cyclone Phailin (2013), Fukushima Daiichi nuclear disaster (2011), 26<sup>th</sup> July 2005 Mumbai flood, Chernobyl meltdown and so on.  (Discuss case studies on disaster with respect to reason for the disaster, incidents, effects of disaster, present scenario and safety measures taken)</p>	<b>08</b>

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

**Books Recommended:**

*Reference Books and Reports:*

1. Disaster Management, by Harsh K.Gupta, Universities Press Publications (2003).
2. Disaster Management: An Appraisal of Institutional Mechanisms in India, by O.S.Dagur, published by Centre for land warfare studies, New Delhi, 2011.
3. Introduction to International Disaster Management, by Damon Copolla, Butterworth Heinemann Elsevier Publications (2015).
4. Disaster Management Handbook, by Jack Pinkowski, CRC Press, Taylor and Francis group (2008).
5. Disaster management & rehabilitation, by Rajdeep Dasgupta, Mittal Publications, New Delhi (2007).
6. Natural Hazards and Disaster Management, Vulnerability and Mitigation, by R B Singh, Rawat Publications (2006).
7. Concepts and Techniques of GIS, by C.P.Lo Albert, K.W. Yonng, Prentice Hall (India) Publications (2006).
8. Risk management of natural disasters, by Claudia G. Flores Gonzales, KIT Scientific Publishing (2010).
9. Disaster Management – a disaster manager’s handbook, by W. Nick Carter, Asian Development Bank (2008).
10. Disaster Management in India, by R. K. Srivastava, Ministry of Home Affairs, GoI, New Delhi (2011)
11. The Chernobyl Disaster: Legacy and Impact on the Future of Nuclear Energy, by Wil Mara, Marshall Cavendish Corporation, New York, 2011.
12. The Fukushima 2011 Disaster, by Ronald Eisler, Taylor & Francis, Florida, 2013.  
(Learners are expected to refer reports published at national and international level and updated information available on authentic web sites)

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Science of Well-being</b>				<b>Course Code: DJ19ILO7018</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
				<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. To create consciousness about importance of holistic health and physical as well as mental well-being.
2. To make learners aware of the concepts of Happiness, Gratitude, Self-Compassion, Empathy etc.
3. To introduce the learners to the means of mental and physical well-being, ill effects of mal-practices like alcoholism, smoking etc.
4. To equip the learners to manage and cope up with stress in their daily living.

**Outcomes:** Upon Completion of the course, the learner should be able to:

1. Describe concepts of holistic health and well-being, differentiate between its true meaning and misconceptions and understand the benefits of well-being.
2. Recognize meaning of happiness, practice gratitude and self-compassion and analyze incidents from one's own life.
3. Understand the causes and effects of stress, identify reasons for stress in one's own surrounding and self.
4. Recognize the importance of physical health and fitness, assess their life style and come up with limitations or effectiveness.
5. Inspect one's own coping mechanism, assess its effectiveness, develop and strategize for betterment and execute it.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Health and well-being:</b> The concept of health, dimensions of health, the notion of well-being, various facets of well-being, relation between health and well-being. Concept of holistic health, its principles and importance, concept and benefits of holistic care, misconceptions about holistic health approach, the application of a true holistic approach to our well-being.	<b>06</b>
<b>2</b>	<b>Concepts of happiness:</b> Happiness: what is it and how do we measure it? Philosophical perspectives on happiness, Happiness: Nature or Nurture? Happiness in the modern world: impediments and accelerators, Narrow vs. Broad Band Approaches to Happiness, Benefits of Happiness, Self-Compassion and Gratitude. Misconceptions of happiness.	<b>08</b>
<b>3</b>	<b>Stress and mental health/well-being:</b> Nature and concept of stress, meaning and definitions of stress, types of stress, meaning of stressors, types of stressors, symptoms of stress, effects of stress, different models of stress. Sources of stress and how does stress cause illness, various sources of stress, delineate between external and internal sources of stress, differentiate between continuous and discrete stressors, the effects of these stressors on health and well-being, diversity of stressors and their health consequences, relation between stress and illness from different perspectives association between stress related physiological mechanisms and different illnesses.	<b>10</b>
<b>4</b>	<b>Physical Well-being / Health management:</b> concept of health behaviours, dimensions of health behaviours. Health enhancing behaviors: Exercise and Weight control, application and importance of these health enhancing behaviours. Health protective behaviors and illness management: concept of illness management, effectiveness of illness management. Concept of Nutrition, Role of Nutrition, Components of Nutrition, concept of Malnutrition, Health compromising behaviours: Alcoholism, Smoking and its effects on health.	<b>10</b>
<b>5</b>	<b>Dealing with Difficult Times / Coping mechanisms:</b> The concept of chronic stress, Health and safety risks of chronic stress, Forms and Treatment of chronic stress, Coping with Acute and Chronic stress, theories of the stress-illness link, role of stress in mental disorders. Concept of coping, Ways of coping and stress management, basic knowledge about stress management, various techniques of stress management, stress management programs. Mental strengths and virtues, Hope, Optimism, Resilience – concept, pathways and models, Meditation and Self-introspection.	<b>08</b>

**Books Recommended:**

*Textbooks:*

1. The Science of well-being by Felicia Huppert, Nick Baylis, Barry Keverne; Oxford University Press
2. Health and Well-Being: Emerging Trends by S. Ojha, U. Rani Srivastava, Shobhna Joshi, Global Vision Publishing House
3. Positive psychology: The scientific and practical explorations of human strengths by Shane J. Lopez, Jennifer Teramoto Pedrotti, Charles Richard Snyder; Sage Publications.

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**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

*Reference Books:*

1. The pursuit of happiness and the realization of sympathy: Cultural patterns of self, social relations, and well-being by Kitayama, S., & Markus, H. R, Culture and subjective well-being, The MIT Press.
2. Man Adapting by Dubos, R; New Haven: Yale University Press.
3. Happiness a history by McMahon D. M., Atlantic Monthly Press.
4. Well-being: The foundations of hedonic psychology by D. Kahneman & E. Diener & N. Schwarz, New York: Russell Sage
5. Selye H. The Stress of Life. New York; McGraw-Hill; 1984.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. Program in Mechanical Engineering:  
Semester VII (Autonomous)  
(Academic Year 2022-2023)**

<b>Program: Final Year Mechanical Engineering</b>				<b>Semester: VII</b>					
<b>Course: Research Methodology</b>				<b>Course Code: DJ19ILO7019</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Pre-requisites:** Basic Knowledge of Probability and Statistics.

**Objectives:**

1. To understand Research and Research Process
2. To acquaint learners with identifying problems for research and develop research strategies
3. To familiarize learners with the techniques of data collection, analysis of data and interpretation

**Outcomes:** On completion of the course, learner will be able to:

1. Prepare a preliminary research design for projects in their subject matter areas
2. Accurately collect, analyze and report data
3. Present complex data or situations clearly
4. Review and analyze research findings
5. Write report about findings of research carried out

**Syllabus for Final Year of B.Tech. Program in Mechanical Engineering:  
Semester VII (Autonomous)  
(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Basic Research Concepts</b> Meaning of research, Objectives of research, Types of research, Significance of research Research process	07
<b>2</b>	<b>Research Methodology:</b> Identification of research problem, Literature review, Formulation of hypothesis, Formulation of Research design.	10
<b>3</b>	<b>Research and Sample Design:</b> Meaning of research and sample design, Need of research design, Features of good research design, Important concepts, Different research designs, Types of sampling designs	10
<b>4</b>	<b>Data Collection and Data Analysis:</b> Types of data, Methods for collecting data: Experiments and surveys, Collection of primary and secondary data, Hypothesis testing and interpretation of Data	10
<b>5</b>	<b>Interpretation and Report Writing:</b> Interpretation and drawing conclusions on the research, Preparation of the report, Ethical Issues	05

**Books Recommended:**

*Reference Books:*

1. Dawson, Catherine, 2002, Practical Research Methods, New Delhi, UBS Publishers Distributors.
2. Kothari, C.R., 1985, Research Methodology-Methods and Techniques, New Delhi, Wiley Eastern Limited.
3. Kumar, Ranjit, 2005, Research Methodology-A Step-by-Step Guide for Beginners, (2<sup>nd</sup> Edition), Singapore, Pearson Education

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which; one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VII</b>					
<b>Course: Public Systems and Policies</b>				<b>Course Code: DJ19ILO7020</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		<b>Total marks (A+ B)</b>
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
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**Pre-requisites:** Basic Knowledge of Social science and Current affairs

**Objectives:**

1. To analyze the transformations in public systems with emphasis on current initiatives and emerging challenges in the field.
2. To understand public systems in a fast-changing environment in the global context.
3. To provide an in-depth understanding of the ills prevailing in the society and aids to identify the solutions for them.
4. To explain public policy and its operations with special focus on policy relating to Government finance.
5. To analyze and evaluate the impact of the public policy on firms and economy at large.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the importance of public systems in a fast-changing environment in the global context.
2. Analyze the transformations in public systems with emphasis on current initiatives and emerging challenges in the field.
3. Explain public policy and its operations with special focus on policy relating to Government finance.
4. Make policies and know about the happenings in the world, in the nation and those in their locality.
5. Analyze and evaluate the impact of the public policy on firms and economy at large and work under various fields as policymakers.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Introduction and Overview of Public Systems:</b> Ideology of Public Systems; Mechanistic and Organic view of Society and Individuals, The Legal Framework; Federal Government; State and Local Governments, Government growth; The size of Government.	10
<b>2</b>	<b>Public Sector in the Economics Accounts:</b> Public Sector in the circular flow; Public Sector in the National Income Accounts.	6
<b>3</b>	<b>Public Choice and Fiscal Politics:</b> Direct Democracy; Representative Democracy; The Allocation Function; The Distribution Function; The Stabilization Function; Coordination of Budget Functions; The Leviathan Hypothesis.	8
<b>4</b>	<b>Introduction and Overview of Public Policy:</b> Markets and Government; Social goods and Market failure, Public expenditure and its evaluation; Cost Benefit Analysis, Public policy and Externalities, Taxation Policy and its impact, Income distribution, redistribution and social security issues Fiscal & Budgetary Policy, Fiscal Federalism in India.	12
<b>5</b>	<b>Case Studies in Expenditure Policy: Public Services</b> A) National Defense B) Highways C) Outdoor Recreation D) Education	6

**Books Recommended:**

**Reference Books:**

1. Introduction to Public Policy by Charles Wheelan, W.W. Norton & Company.
2. Understanding Public Policy by Thomas R. Dye, Prentice Hall.
3. Public Policy-Making: An Introduction by Anderson J.E., Boston, Houghton.
4. Public Administration by Avasthi & Maheshwari, Lakshminarayan Agarwal, Agra.
5. New Horizons of Public Administration by Bhattacharya, Mohit, Jawahar Publishers, New Delhi.
6. Public Administration and Public Affairs by Henry, Nicholas, Prentice Hall of India, New Delhi.
7. Public Finance 10<sup>th</sup> Edition by Harvey S Rosen and Ted Gayer, McGraw-Hill Education, 2013.
8. Public Finance in Theory and Practice by Musgrave and Musgrave.

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VII (Autonomous)**  
**(Academic Year 2022-2023)**

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester, out of which one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Project Management</b>				<b>Course Code: DJ19ILO8021</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Pre-requisites:** Basic concepts of Management.

**Objectives:**

1. To familiarize the students with the use of a structured methodology/approach for every unique project undertaken, utilizing project management concepts, tools and techniques.
2. To appraise the students with the project management life cycle and make them knowledgeable about the various phases from project initiation through closure.

**Outcomes:** On completion of the course, learner will be able to:

1. Explain project management life cycle and the various project phases as well as the role of project manager.
2. Apply selection criteria and select an appropriate project from different options.
3. Create a work break down structure for a project and develop a schedule based on it. Manage project risk strategically.
4. Use Earned value technique and determine & predict status of the project.
5. Capture lessons learned during project phases and document them for future reference.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Project Management Foundation:</b> Definition of a project, Project Vs Operations, Necessity of project management, Triple constraints, Project life cycles (typical & atypical) Project phases and stage gate process. Role of project manager, Negotiations and resolving conflicts, Introduction to project leadership, ethics in projects, Multicultural and virtual projects, Project management in various organization structures, PM knowledge areas as per Project Management Institute (PMI).	<b>07</b>
<b>2</b>	<b>Initiating Projects:</b> How to get a project started, selecting project strategically, Project selection models (Numeric /Scoring Models and Non-numeric models), Project portfolio process, Project sponsor and creating charter, Effective project team, Stages of team development & growth (forming, storming, norming & performing), team dynamics.	<b>08</b>
<b>3</b>	<b>Project Planning:</b> Work Breakdown structure (WBS) and linear responsibility chart, Project cost estimation and budgeting, Top down and bottoms up budgeting, Networking and Scheduling techniques, PERT, CPM, Crashing project time, Resource loading and levelling, Goldratt's critical chain, GANTT chart, Project Stakeholders and Communication plan, Introduction to Project Management Information System (PMIS). <b>Risk Management in projects:</b> Risk management planning, Risk identification and risk register, Qualitative and quantitative risk assessment, Probability and impact matrix. Risk response strategies for positive and negative risks.	<b>12</b>
<b>4</b>	<b>Monitoring and Controlling Projects</b> Planning monitoring and controlling cycle, Information needs and reporting, engaging with all stakeholders of the projects, communication and project meetings. Earned Value Management techniques for measuring value of work completed, using milestones for measurement, change requests and scope creep, Project audit. <b>Project Contracting</b> Project procurement management, contracting and outsourcing.	<b>08</b>
<b>5</b>	<b>Closing the Project:</b> Customer acceptance, Reasons of project termination, Various types of project terminations (Extinction, Addition, Integration, Starvation), Process of project termination, completing a final report, doing a lessons learned analysis, acknowledging successes and failures.	<b>07</b>

**Books Recommended:**

*Text books:*

1. Project Management: A managerial approach, Jack Meredith & Samuel Mantel, 7th Edition, Wiley India.
2. Project Management: The Managerial Process, 6th edition, Erik Larson, Clifford Gray, McGraw Hill Education.

*Reference Books:*

1. A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 5th Ed, Project Management Institute PA, USA.
2. Project Management, Gido Clements, Cengage Learning.
3. Project Management, Gopalan, Wiley India.
4. Project Management, Dennis Lock, 9th Edition, Gower Publishing England.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Entrepreneurship Development and Management</b>				<b>Course Code: DJ19ILO8022</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Pre-requisites:** Basic concepts of Management.

**Objectives:**

1. To develop entrepreneurial abilities by providing background information about support systems, skill sets, financial and risk covering institutions.
2. To appraise the students with the fundamentals that can help them to make right decisions for starting and running an enterprise.

**Outcomes:** On completion of the course, learner will be able to:

1. Develop idea generation, creative and innovative skills
2. Prepare a Business Plan
3. Compare different entrepreneur supporting institutions
4. Correlate suitable MSME scheme for an entrepreneur
5. Interpret financial and legal aspect of a business.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Entrepreneur &amp; Entrepreneurship:</b> Meaning of entrepreneur - Evolution of the concept - Functions of an Entrepreneur - Types of Entrepreneurs - Intrapreneur- an emerging class - Concept of Entrepreneurship - Evolution of Entrepreneurship - Development of Entrepreneurship - Entrepreneurial Culture - Stages in entrepreneurial process - Develop idea generation, creative and innovative skills	<b>6</b>
<b>2</b>	<b>Business Planning Process:</b> Meaning of business plan - Business plan process - Advantages of business planning - Marketing plan - Production/operations plan - Organization plan - Financial plan - Final Project Report with Feasibility Study - Preparing a model project report for starting a new venture.	<b>10</b>
<b>3</b>	<b>Institutions Supporting Entrepreneurs:</b> Small industry financing developing countries - A brief overview of financial institutions in India - Central level and state level institutions - SIDBI - NABARD - IDBI - SIDCO - Indian Institute of Entrepreneurship - District Industries Centers - Single Window System.	<b>6</b>
<b>4</b>	<b>Micro, Small, and Medium Enterprises (MSMES)</b> MSMEs – Definition and Significance in Indian Economy; MSME Schemes, Challenges and Difficulties in availing MSME Schemes, Forms of Business; Make-In India, Start-Up India, Stand-Up India. Women Entrepreneurship; Rural Entrepreneurship; Family Business and First-Generation Entrepreneurs	<b>8</b>
<b>5</b>	<b>Finance, Account, Costing and Legal Aspect of Business</b> Funding new ventures – Conventional Source of Finance - bootstrapping, crowd sourcing- angel investors, VCs, debt financing , due diligence, Legal aspects of business (IPR, GST, Labour law)- Cost, volume, profit and break-even analysis - Margin of safety and degree of operating leverage - Capital budgeting for comparing projects or opportunities - Product costing- Product pricing- Introduction to financial statements - Profit & Loss statement - Balance sheet - Cash flow - Closure of Business	<b>12</b>

**Books Recommended:**

*Reference Books:*

1. Effective Entrepreneurial Management: Strategy, Planning, Risk Management, and Organization - by Robert D. Hisrich • Veland Ramadani, Springer Publication (2017)
2. Entrepreneurship- Theory, Process Practice –by Donald F. Kuratko, Cengage Learning(2014)
3. Entrepreneurship 6/E –by Robert D. Hisrich McGraw-Hill Education (India) (2011)
4. Entrepreneurship and small business- by Burns, P. New Jersey: Palgrave. (2001).
5. Innovation and entrepreneurship by Drucker. F. Peter, Harper business, (2006).
6. Entrepreneurship development small business enterprises, Poornima M Charantimath Pearson Publication (2013)
7. Entrepreneurial Development -Jayshree Suresh, Margham Publishers, Chennai
8. The Design of Business- by Martin Roger, Harvard Business Publishing (2009)
9. Entrepreneurship- by Roy Rajiv Oxford University Press (2011)

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Corporate Social Responsibility</b>				<b>Course Code: DJ19ILO8023</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation / Journal</b>	
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**Objectives:**

1. To make students understand the concept, theories and application of CSR for the Development of the Society.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the key characteristics of Corporate Social Responsibility (CSR) in the context of present-day management.
2. Apprise regarding business decision-making which is informed by ethical values and respect for people communities and the environment.
3. Become aware of creating a strategic plan that enables an organization to reach out to its internal and external stakeholders with consistent messages.
4. Understand critical issues of Corporate Social Responsibility (CSR) in a cross-cultural setting

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Introduction to CSR</b> Meaning and Definition, History of CSR, Concepts of Charity, Corporate philanthropy, Corporate Citizenship, Sustainability and Stakeholder Management. Environmental aspect of CSR Chronological evolution and Models of CSR in India Carroll's model Major codes on CSR Initiatives in India.	<b>06</b>
<b>2</b>	<b>International framework for Corporate Social Responsibility</b> Millennium Development Goals, Sustainable Development Goals, Relationship between CSR and MDGs. United Nations (UN) Global Compact 2011. UN guiding principles on business and human rights. OECD CSR policy tool, ILO tri-partite declaration of principles on multinational enterprises and social policy.	<b>10</b>
<b>3</b>	<b>CSR-Legislation in India and the World</b> Section 135 of Companies Act 2013.Scope for CSR Activities under Schedule VII, Appointment of Independent Directors on the Board, and Computation of Net Profit's Implementing Process in India.	<b>10</b>
<b>4</b>	<b>The Drivers of CSR in India</b> Market based pressure and incentives, civil society pressure, the regulatory environment in India Counter trends, Review of current trends and opportunities in CSR, Review of successful corporate initiatives and challenges of CSR. Case Studies of Major CSR Initiatives Corporate Social Responsibility and Public-Private Partnership (PPP)	<b>08</b>
<b>5</b>	<b>Identifying key stakeholders of CSR</b> Role of Public Sector in Corporate, government programs, Nonprofit and Local Self Governance in implementing CSR, Global Compact Self-Assessment Tool, National Voluntary Guidelines by Govt. of India, Roles and responsibilities of corporate foundations.	<b>08</b>

**Books Recommended:**

*Text Books:*

1. Corporate Social Responsibility in India, Sanjay K Agarwal, Sage Publications, 2008
2. Corporate Social Responsibility in India, Bidyut Chakrabarty, Routledge, New Delhi, 2015.

*Reference Books:*

1. Corporate Social Responsibility: An Ethical Approach, Mark S. Schwartz, Broadview Press, 2011
2. Attaining Sustainable Growth through Corporate Social Responsibility, George Pohle and Jeff Hittner, IBA Global Business Services, 2008
3. Strategic Corporate Social Responsibility: Stakeholders in a Global Environment, William B. Werther Jr. and David Chandler, 2<sup>nd</sup> Edition, Sage Publications, 2011

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Human Resource Management</b>				<b>Course Code: DJ19ILO8024</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
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**Objectives:**

1. To introduce the students with basic concepts, techniques and practices of the human resource management.
2. To provide opportunity of learning Human resource management (HRM) processes, related with the functions, and challenges in the emerging perspective of today's organizations.
3. To familiarize the students about the latest developments, trends & different aspects of HRM.
4. To acquaint the student with the importance of inter-personal & inter-group behavioral skills in an organizational setting required for future stable engineers, leaders and managers.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the concepts, aspects, techniques and practices of the human resource management.
2. Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
3. Gain knowledge about the latest developments and trends in HRM.
4. Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Introduction to HR</b>  Human Resource Management- Concept, Scope and Importance, Interdisciplinary Approach Relationship with other Sciences, Competencies of HR Manager, HRM functions.  Human resource development (HRD): changing role of HRM – Human resource Planning, Technological change, Restructuring and rightsizing, Empowerment, TQM, Managing ethical issues.</p>	<b>07</b>
<b>2</b>	<p><b>Organizational Behaviour (OB)</b>  Introduction to OB Origin, Nature and Scope of Organizational Behaviour, Relevance to Organizational Effectiveness and Contemporary issues.  Personality: Meaning and Determinants of Personality, Personality development, Personality Types, Assessment of Personality Traits for Increasing Self Awareness.  Perception: Attitude and Value, Effect of perception on Individual Decision-making, Attitude and Behaviour.  Motivation: Theories of Motivation and their Applications for Behavioural Change (Maslow, Herzberg, McGregor);  Group Behaviour and Group Dynamics: Work groups formal and informal groups and stages of group development, Team Effectiveness: High performing teams, Team Roles, cross functional and self-directed team.  Case study.</p>	<b>08</b>
<b>3</b>	<p><b>Organizational Structure &amp; Design</b>  Structure, size, technology, Environment of organization; Organizational Roles &amp; conflicts: Concept of roles; role dynamics; role conflicts and stress.  Leadership: Concepts and skills of leadership, Leadership and managerial roles, Leadership styles and contemporary issues in leadership.  Power and Politics: Sources and uses of power; Politics at workplace, Tactics and strategies.</p>	<b>08</b>
<b>4</b>	<p><b>Human resource Planning</b>  Recruitment and Selection process, Job-enrichment, Empowerment – Job Satisfaction, employee morale.  Performance Appraisal Systems: Traditional &amp; modern methods, Performance Counselling, Career Planning.  Training &amp; Development: Identification of Training Needs, Training Methods.  <b>Strategic HRM:</b> Role of Strategic HRM in the modern business world, Concept of Strategy, Strategic Management Process, Approaches to Strategic Decision Making; Strategic Intent – Corporate Mission, Vision, Objectives and Goals.</p>	<b>09</b>
<b>5</b>	<p><b>Labor Laws &amp; Industrial Relations:</b> Evolution of IR, IR issues in organizations, Overview of Labor Laws in India; Industrial Disputes Act, Trade Unions Act, Shops and Establishments Act.  <b>Emerging Trends in HR</b>  Organizational development; Business Process Re-engineering (BPR), BPR as a tool for organizational development, managing processes &amp; transformation in HR. Organizational Change, Culture, Environment.</p>	<b>10</b>

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

	Cross Cultural Leadership and Decision Making: Cross Cultural Communication and diversity at work, Causes of diversity, managing diversity with special reference to handicapped, women and ageing people, intra company cultural difference in employee motivation.	
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**Books Recommended:**

*Reference Books:*

1. Stephen Robbins, Organizational Behavior, 16th Ed, 2013
2. V S P Rao, Human Resource Management, 3rd Ed, 2010, Excel publishing
3. Aswathapa, Human resource management: Text & cases, 6th edition, 2011
4. C. B. Mamoria and S V Gankar, Dynamics of Industrial Relations in India, 15th Ed, 2015, Himalaya Publishing, 15th edition, 2015
5. P. Subba Rao, Essentials of Human Resource management and Industrial relations, 5th Ed, 2013, Himalaya Publishing
6. Laurie Mullins, Management & Organizational Behavior, Latest Ed, 2016, Pearson Publications

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Corporate Finance Management</b>				<b>Course Code: DJ19ILO8025</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. Overview of Indian financial system, instruments and market.
2. Basic concepts of value of money, returns and risks, corporate finance, working capital and its management.
3. Knowledge about sources of finance, capital structure, dividend policy.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand Indian finance system.
2. Apply concepts of time value money and risk returns to product, services and business.
3. Understand corporate finance; evaluate and compare performance of multiple firms.
4. Take Investment, finance as well as dividend decisions.

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**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Overview of Indian Financial System:</b> Characteristics, Components and Functions of Financial System. Financial Instruments: Meaning, Characteristics and Classification of Basic Financial Instruments — Equity Shares, Preference Shares, Bonds-Debentures, Certificates of Deposit, and Treasury Bills. Financial Markets: Meaning, Characteristics and Classification of Financial Markets — Capital Market, Money Market and Foreign Currency Market Financial Institutions: Meaning, Characteristics and Classification of Financial Institutions — Commercial Banks, Investment-Merchant Banks and Stock Exchanges	<b>07</b>
<b>2</b>	<b>Overview of Corporate Finance:</b> Objectives of Corporate Finance; Functions of Corporate Finance—Investment Decision, Financing Decision, and Dividend Decision. Financial Ratio Analysis: <b>Overview of Financial Statements:-</b> Balance Sheet, Profit and Loss Account, and Cash Flow Statement; Purpose of Financial Ratio Analysis; Liquidity Ratios; Efficiency or Activity Ratios; Profitability Ratios; Capital Structure Ratios; Stock Market Ratios; Limitations of Ratio Analysis	<b>09</b>
<b>3</b>	<b>Concepts of Returns and Risks:</b> Measurement of Historical Returns and Expected Returns of a Single Security and a Two-security Portfolio; Measurement of Historical Risk and Expected Risk of a Single Security and a Two-security Portfolio. <b>Time Value of Money:</b> Future Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Present Value of a Lump Sum, Ordinary Annuity, and Annuity Due; Continuous Compounding and Continuous Discounting.	<b>07</b>
<b>4</b>	<b>Working Capital Management:</b> Concepts of Meaning Working Capital; Importance of Working Capital Management; Factors Affecting an Entity's Working Capital Needs; Estimation of Working Capital Requirements; Management of Inventories; Management of Receivables; and Management of Cash and Marketable Securities. <b>Capital Budgeting:</b> Meaning and Importance of Capital Budgeting; Inputs for Capital Budgeting Decisions; Investment Appraisal Criterion—Accounting Rate of Return, Payback Period, Discounted Payback Period, Net Present Value(NPV), Profitability Index, Internal Rate of Return (IRR), and Modified Internal Rate of Return (MIRR)	<b>10</b>
<b>5</b>	<b>Capital Structure:</b> Factors Affecting an Entity's Capital Structure; Overview of Capital Structure Theories and Approaches— Net Income Approach, Net Operating Income Approach; Traditional Approach, and Modigliani-Miller Approach. Relation between Capital Structure and Corporate Value; Concept of Optimal Capital Structure <b>Dividend Policy:</b> Meaning and Importance of Dividend Policy; Factors Affecting an Entity's Dividend Decision; Overview of Dividend Policy Theories and Approaches— Gordon's Approach, Walter's Approach, and Modigliani-Miller Approach	<b>09</b>

**Books Recommended:**

*Reference Books:*

1. Fundamentals of Financial Management, 13th Edition (2015) by Eugene F. Brigham and Joel F. Houston; Publisher: Cengage Publications, New Delhi.
2. Analysis for Financial Management, 10th Edition (2013) by Robert C. Higgins; Publishers: McGraw Hill Education, New Delhi.

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3. Indian Financial System, 9th Edition (2015) by M. Y. Khan; Publisher: McGraw Hill Education, New Delhi.
4. Financial Management, 11th Edition (2015) by I. M. Pandey; Publisher: S. Chand (G/L) & Company Limited, New Delhi.
5. Financial Management, Theory & Practice 8th Edition (2011), by Prasanna Chandra: Tata McGraw Hill Education Private Limited, New Delhi.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Consisting **One Class Tests for 25 marks** based on approximately 50% of contents and One case study with presentations for 25 Marks.
2. Total duration allotted for writing test paper is 1 hr.
3. Average of the marks scored in the tests and case study will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Logistic and Supply Chain Management</b>				<b>Course Code: DJ19ILO8026</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. To acquaint with the concept of key drivers of supply chain performance and their inter-relationships with strategy.
2. To acquaint with the design problems and develop an understanding of information technology in supply chain optimization.
3. To acquaint with the complexity of inter-firm and intra-firm coordination in implementing programs such as e-collaboration, quick response, jointly managed inventories and strategic alliances.

**Outcomes:** On completion of the course, learner will be able to:

1. Demonstrate the functional strategy map of supply chain management.
2. Analyze the determinants of Supply Chain and Transportation networks design.
3. Demonstrate the need of coordination and sourcing decisions in supply chain.
4. Understand pricing, revenue management and role of IT in supply chain.
5. Understand various sustainability aspects of a supply chain.

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**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Understanding the Supply Chain:</b> Objective, Importance, Decision Phases, Process Views.</p> <p><b>Achieving Strategic Fit and Scope:</b> Competitive and Supply Chain Strategies, Achieving Strategic Fit, Expanding Strategic Scope, Challenges to Achieving and Maintaining Strategic Fit.</p> <p><b>Supply Chain Drivers and Metrics:</b> Financial Measures of Performance, Drivers of Supply Chain Performance, Framework for Structuring Drivers, Facilities, Inventory, Transportation, Information, Sourcing, Pricing.</p> <p><b>Creating the Responsive Supply Chain:</b> Product push versus demand pull, The Japanese philosophy, The foundations of agility, A route-map to responsiveness.</p>	<b>08</b>
<b>2</b>	<p><b>Designing the Supply Chain and Transportation Networks</b></p> <p><b>Designing Distribution Networks:</b> The Role of Distribution in the Supply Chain, Factors Influencing Distribution Network Design, Design Options for a Distribution Network.</p> <p><b>Network Design in the Supply Chain:</b> The Role of Network Design in the Supply Chain, Factors Influencing Network Design Decisions, Framework for Network Design Decisions, Models for Facility Location and Capacity Allocation.</p> <p><b>Designing Global Supply Chain Networks:</b> The Impact of Globalization on Supply Chain Networks, The Offshoring Decision: Total Cost, Risk Management in Global Supply Chains, Discounted Cash Flows, Evaluating Network Design Decisions Using Decision Trees.</p> <p><b>Transportation in a Supply Chain:</b> The Role of Transportation in a Supply Chain, Modes of Transportation and their Performance Characteristics, Design Options for a Transportation Network, Trade-Offs in Transportation Design, Tailored Transportation.</p>	<b>14</b>
<b>3</b>	<p><b>Coordination in a Supply Chain:</b> Lack of Supply Chain Coordination and the Bullwhip Effect, The Effect on Performance of Lack of Coordination, Obstacles to Coordination in a Supply Chain, Managerial Levers to Achieve Coordination, Continuous Replenishment and Vendor-Managed Inventories, Collaborative Planning, Forecasting, and Replenishment.</p> <p><b>Sourcing Decisions in a Supply Chain:</b> The Role of Sourcing in a Supply Chain, In-House or Outsource, Third- and Fourth-Party Logistics Providers, Using Total Cost to Score and Assess Suppliers, Supplier Selection—Auctions and Negotiations, Contracts, Risk Sharing and Supply Chain Performance, Design Collaboration, The Procurement Process.</p>	<b>07</b>

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<b>4</b>	<p><b>Pricing and Revenue Management in a Supply Chain:</b>  The Role of Pricing and Revenue Management in a Supply Chain, Pricing and Revenue Management for Multiple Customer Segments, Pricing and Revenue Management for Perishable Assets, Pricing and Revenue Management for Seasonal Demand, Pricing and Revenue Management for Bulk and Spot Contracts.</p> <p><b>Information Technology in a Supply Chain:</b>  The Role of IT in a Supply Chain, The Supply Chain IT Framework, Customer Relationship Management, Internal Supply Chain Management, Supplier Relationship Management, The Transaction Management Foundation, Managing the supply chain as a network, Seven major business transformations, From 3PL to 4PL. The Future of IT in the Supply Chain.</p>	<b>08</b>
<b>5</b>	<p><b>Creating a Sustainable Supply Chain:</b>  The Role of Triple Bottom Line, Key Metrics for Sustainability, Greenhouse gases and the supply chain, Reducing the transport-intensity of supply chains, Beyond the carbon footprint, Reduce, reuse, recycle, Sustainability and Supply Chain Drivers.</p> <p><b>Introduction to the Supply Chain of the Future:</b>  Emerging Megatrends.</p>	<b>05</b>

**Books Recommended:**

*Reference Books:*

1. Logistics & Supply Chain Management, Martin Christopher, Pearson Education Limited, 2016.
2. Supply Chain Management Strategy, Planning, and Operation, Sunil Chopra and Peter Meindl, Pearson, 2016.
3. Essentials of Supply Chain Management, Michael H. Hugos, Wiley, 2018.
4. Supply Chain Management For Dummies, Daniel Stanton, Wiley, 2020.
5. Global Supply Chain and Operations Management A Decision-Oriented Introduction to the Creation of Value, Dmitry Ivanov, Alexander Tsipoulanidis and Jörn Schönberger, Springer International Publishing, 2016.
6. Supply Chain Management, Sinha, McGraw-Hill Education (India) Pvt Limited, 2012.

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Continuous Assessment (B):**

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: IPR and Patenting</b>				<b>Course Code: DJ19ILO8027</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
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**Objectives:**

1. Understanding, defining and differentiating different types of intellectual properties (IPs)
2. Assessing different IP management (IPM) approaches
3. Exposure to the Legal management of IP and understanding of real life practice of IPM.

**Outcomes:** On completion of the course, learner will be able to:

1. Recognize the crucial role of IP for the purposes of product and technology development.
2. Understand how and when to file a patent
3. Apply the knowledge to understand the entire ecosystem
4. Derive value from IP and leverage its value in new product and service development

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<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Concept of Intellectual Property Law</b>            Idea/Expression dichotomy, Introduction and the need for intellectual property right (IPR), Intellectual Property laws, IPR in India: Genesis and development, IPR abroad, Major International Instruments concerning Intellectual Property Rights: Paris Convention, the Berne Convention, the Universal Copyright Convention, the WIPO Convention, the Patent Cooperation Treaty, the TRIPS Agreement, incentive theory, types of IPR, India's New National IP Policy, 2016, Govt. Schemes in IPR IP</p>	<b>06</b>
<b>2</b>	<p><b>Patents and Trademarks</b>            Elements of Patentability: Novelty, Non Obviousness, Industrial Application, Non Patentable Subject Matter, Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies &amp; Penalties, Patent office and Appellate Board, Case study of existing patents related to software, healthcare, devices            Concept of Trademarks, Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks), Non Registrable Trademarks, Registration of Trademarks, Rights of holder and assignment and licensing of marks, Infringement, Remedies &amp; Penalties, Trademarks registry and appellate board</p>	<b>12</b>
<b>3</b>	<p><b>Copyrights and Design</b>            Copyrights: Nature, Subject matter: original literary, dramatic, musical, artistic works, cinematograph films and sound recordings, Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright, Infringement, Remedies &amp; Penalties, Related Rights, distinction between related rights and copyrights            Design: meaning and concept of novel and original, procedure for registration, effect of registration and term of protection</p>	<b>10</b>
<b>4</b>	<p><b>GI, PVP and LDP</b>            Geographical indication: meaning, difference between GI and trademarks, procedure for registration, effect of registration and term of protection            Plant variety protection: meaning, benefit sharing, farmers' rights, procedure for registration, effect of registration and term of protection            Layout Design protection: meaning, procedure for registration, effect of registration, term of protection</p>	<b>08</b>
<b>5</b>	<p><b>Beyond IP</b>            Introduction to Competition Law: concept of competition, relationship and Interaction between IPR and competition law, IP and competition issues, Technology transfer agreements. EU experience with IP and Competition Law, Indian Competition Act and IPR protection, IPR issues in merger and acquisition, harmonization of IP protection and competition Law in India</p>	<b>06</b>

**Books Recommended:**

*Reference Books:*

1. Feroz Ali, The Law of Patents, LexisNexis
2. Ronald D. Slusky, Invention Analysis and Claiming – A Patent Lawyer's Guide, Second Edition, American Bar Association, 2012.
3. Feroz Ali, The Touchstone Effect – The Impact of Pre-grant Opposition on Patents, LexisNexis, 2009.

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4. Innovation and entrepreneurship by Drucker. F. Peter, Harper business, (2006).
5. Intellectual Property Rights, Deborah. E. Bouchoux, Cengage Learning.
6. Intellectual Property Rights– Unleashmy The Knowledge Economy, Prabuddha Ganguli, Tate Mc Graw Hill Publishing Company Ltd.,
7. The Design of Business- by Martin Roger, Harvard Business Publishing (2009)

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Digital Marketing Management</b>				<b>Course Code: DJ19ILO8028</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				75			25	25	25
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
3	--	--	3	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
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**Objectives:**

1. To explain the evolution of digital marketing and outline the underlying technology and frameworks within which digital marketing operates.
2. To understand digital marketing business models elucidating on the six core digital value elements and how they can be used to generate customer value.
3. To understand the key concepts of developing strategy for digital business and the emerging business structures.
4. To plan the digital marketing strategy roadmap, its four key stages and their elements and understand the 6S Digital Marketing Implementation Stages.
5. To understand digital marketing planning & operations setup.
6. To explain the implementation of search campaigns which include Search Engine Marketing (SEM) and Search Engine Optimization (SEO) concepts.
7. To explain upcoming digital marketing concepts including Big Data and Internet of Things (IoT), Small and Medium Businesses (SMB), B2B marketing and Social, Local and Mobile (SoLoMo) concept.

**Outcomes:** On completion of the course, learner will be able to:

1. Understand the digital marketing framework & model and consumer behaviour.
2. Develop digital marketing strategy roadmap.
3. Explain the terminology and concepts for developing web-specific media plans.
4. Understand concepts related to digital campaign management and revenue generation models.
5. Get a perspective on global digital marketing technology/tools and future trends.

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<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<p><b>Introduction to Digital Marketing</b> Emergence of Digital Marketing as a tool, media consumption drivers for new marketing environment, applications and benefits of digital marketing.</p> <p><b>Digital Marketing Framework</b> Delivering enhanced customer value, market opportunity analysis and digital services development, ASCOR framework, critical success factors for digital marketing.</p> <p><b>Digital Marketing Models Creation</b> Factors impacting digital marketplace, value chain digitization, business models.</p> <p><b>The Consumer for Digital Marketing</b> Consumer behavior on the internet, evolution of consumer behavior models, managing consumer demand, integrated marketing communications (IMC), impact of digital channels on IMC.</p>	<b>08</b>
<b>2</b>	<p><b>Digital marketing Strategy Development</b> Elements of assessment phase, macro-micro environmental analysis, marketing situation analysis.</p> <p><b>Digital Marketing Internal Assessment and Objectives Planning</b> Analyzing present offerings mix, marketing mix, core competencies analysis and internal resource mapping. Digital presence analysis, digital marketing objectives development and review.</p> <p><b>Digital Marketing Strategy Definition</b> Understanding digital business strategy and structures, consumer development strategy, offering mix for Digital, digital pricing models, managing promotional channels and developing the extended Ps- People, process, programs and performance.</p> <p><b>Digital marketing Strategy Roadmap</b> Developing digital marketing strategy roadmap, the 6s digital marketing implementation strategy, marketing across the product life cycle.</p>	<b>13</b>
<b>3</b>	<p><b>Digital Marketing Planning and Setup</b> Understanding digital media planning terminology and stages, steps to creating marketing communications strategy, introduction to search marketing, display marketing, social media marketing.</p> <p><b>Digital Marketing Operations Setup</b> Basics of lead generation and conversion marketing, website content development and management, elements of user experience, web usability and evaluation.</p>	<b>08</b>
<b>4</b>	<p><b>Digital marketing Execution</b> Basic elements of digital campaign management, search execution, display execution, social media execution, content marketing.</p> <p><b>Digital marketing Execution Elements</b> Digital revenue generation models, managing service delivery and payments, managing digital implementation challenges like e commerce, internal &amp; external and consumer specific challenges.</p>	<b>08</b>

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<b>5</b>	<b>Digital Business – Present and Future</b> Digital Marketing – Global Landscape, digital marketing overview – global spend, advertising spend, and technology/tools landscape. Data technologies (Big data and IOT) impacting marketing, segment based digital marketing and SoLoMo – the next level of hyperlocal marketing.	<b>05</b>
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**Books Recommended:**

*Reference Books:*

1. Fundamentals of Digital Marketing by Puneet Singh Bhatia, Pearson Education Limited,
2. Digital Marketing by Seema Gupta- McGraw Hill Education.
3. Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing by Dave Chaffey and P. R. Smith, 5<sup>th</sup> edition, Taylor & Francis.
4. Digital Marketing: Strategy, Implementation and Practice- 6<sup>th</sup> edition by Dave Chaffey Fiona Ellis-Chadwick, Pearson Education Limited,
5. Digital marketing by Vandana Ahuja, Oxford University Press.
6. The Art of Digital Marketing by Ian Dodson, John Wiley & Sons.

**Evaluation Scheme:**

***Semester End Examination (A):***

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Environmental Management</b>				<b>Course Code: DJ19ILO8029</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Pre-requisite:** Knowledge of environmental science.

**Objectives:**

1. Understand and identify environmental issues relevant to India and global concerns
2. Learn concepts of ecology
3. Familiarise environment related legislations
4. Understand Environmental Auditing Procedures.

**Outcomes:** On completion of the course, learner will be able to:

1. Identify Environmental issues and get familiarized to the concept of Ecosystem and environmental management.
2. Know policies and legal aspects and understand EM system standards.
3. Understand Environment Impact assessment.
4. Understand Environment Auditing procedures.
5. Describe Environmental management Techniques

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
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**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Principles of Environmental management (EM):</b> Introduction of EM, Definition, Ecosystem concept, Participants in EM, Ethics and the environment, International Environmental Movement, Environmental issues relevant to India.	<b>08</b>
<b>2</b>	<b>Policy and Legal Aspects of EM:</b> - Introduction to various Environmental Policies, Indian and International Environmental laws and legislation. <b>EM system Standards:</b> - Core Elements, Benefits, Certification Body Assessment & Documentation for EMS, ISO- 14000 Standards.	<b>10</b>
<b>3</b>	<b>Environmental Impact Assessment (EIA) :-</b> Purpose, steps, hierarchy of EIA, Environmental Impact Statement and Impact Indicators, Evolution of IA in India and worldwide. Preliminary stages of EIA, Impact, Prediction, Evaluation and Mitigation.	<b>10</b>
<b>4</b>	<b>Environmental Auditing (EA):-</b> Objectives, Scope and Types of EA, Audit Methodology, Elements of Audit Process, Auditing of EMS.	<b>06</b>
<b>5</b>	<b>Environmental Management Techniques:</b> - Environmental Monitoring and Modelling, Environmental technology Assessment and Environmental Risk Assessment, Eco-mapping.	<b>08</b>

**Books Recommended:**

*Text Books:*

1. Environmental Management, T V Ramachandra and Vijay Kulkarni, TERI Press
2. Environmental Management: Principles and Practice, C J Barrow, Routledge Publishers London, 1999

*Reference Books:*

1. A Handbook of Environmental Management Edited by Jon C. Lovett and David G. Ockwell, Edward Elgar Publishing
2. Indian Standard Environmental Management Systems — Requirements with Guidance for Use, Bureau Of Indian Standards, February 2005
3. Environmental Management: An Indian Perspective, S N Chary and Vinod Vyasulu, Macmillan India, 2000
4. Introduction to Environmental Management, Mary K Theodore and Louise Theodore, CRC Press
5. Environment and Ecology, Majid Hussain, 3<sup>rd</sup> Ed. Access Publishing.2015

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.
2. Total duration allotted for writing the paper is 3 hrs.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the two tests will be considered for final grading.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Program: Final Year (Common for All Programs)</b>				<b>Semester: VIII</b>					
<b>Course: Labour and Corporate Law</b>				<b>Course Code: DJ19ILO8030</b>					
<b>Teaching Scheme (Hours / week)</b>				<b>Evaluation Scheme</b>					
				<b>Semester End Examination Marks (A)</b>			<b>Continuous Assessment Marks (B)</b>		
<b>Lectures</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Total Credits</b>	<b>Theory</b>			<b>Term Test 1</b>	<b>Term Test 2</b>	<b>Avg.</b>
				<b>75</b>			<b>25</b>	<b>25</b>	<b>25</b>
				<b>Laboratory Examination</b>			<b>Term work</b>		<b>Total Term work</b>
<b>3</b>	<b>--</b>	<b>--</b>	<b>3</b>	<b>Oral</b>	<b>Practical</b>	<b>Oral &amp; Practical</b>	<b>Laboratory Work</b>	<b>Tutorial / Mini project / presentation/ Journal</b>	
				<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

**Objectives:**

1. To understand the development and judicial setup of Labour Laws.
2. To learn the laws relating to Industrial Disputes, Social Security and Working conditions.
3. To analyse the laws related to corporate governance in different settings.
4. To develop awareness of legal principles involved in economic relationships and business transactions.
5. To develop an understanding of free enterprise system and legal safeguards of the same.

**Outcomes:** On completion of the course, learner will be able to:

1. Illustrate the role of trade union in the industrial setup.
2. Understand the important causes, impact of industrial disputes and settlement procedures.
3. To provide in-depth understanding of corporate social responsibility.
4. Apply concepts, principles and theories to understand simple business laws.
5. Analyse the principle of international business and strategies adopted by firms to expand globally

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

<b>Detailed Syllabus (Unit wise)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration in Hours</b>
<b>1</b>	<b>Trade Unions and Collective Bargaining:</b> Trade Unionism in India, Definition of Trade Union and Trade Dispute, General and Political Funds of Trade Union, Civil and Criminal Immunities of Registered Trade Unions, Recognition of Trade Union, Collective Bargaining	9
<b>2</b>	<b>Industrial Dispute and Instruments of Economic Coercion:</b> Industrial Dispute and Individual Dispute, Settlement of Industrial Dispute. Concept of strike – Gherao, Bandh and Lock-out, Types of Strike Rights to Strike and Lock-out	8
<b>3</b>	<b>Formation of a Company and Corporate governance:</b> Company and Other Forms of Business Organizations, Different Kinds of Company: One Person Company, Foreign Company. Kinds of Company Meetings and Procedure Powers, Duties and Kinds of Director: Independent Director, Women Director Different Prevention of Oppression and Mismanagement Investor Protection, Insider Trading, Corporate Fraud.	9
<b>4</b>	<b>Corporate Social Responsibility and Corporate Liquidation:</b> Evolution of Corporate Social Responsibility, Corporate Criminal liability, Corporate Environmental Liability Different Types of Winding up of Company, Role of Courts in Winding up of Company Merger and Acquisition of Company, Cross Border Merger, Takeover Code: Role of SEBI	8
<b>5</b>	<b>Case Studies on</b> A) Labour law B) Labour relations C) Corporate laws D) Securities laws	8

**Books Recommended:**

*Reference Books:*

1. Surya Narayan Misra, An Introduction to Labour and Industrial Law, Allahabad Law Agency, 1978
2. Indian Law Institute, Cases and Materials on Labour Law and Labour Relations
3. P.L. Malik, Industrial Law, Eastern Book Company, 2013
4. S.C. Srivastava, Industrial Relations and Labour Law, Vikas Publishing House, New Delhi
5. C.A. Kamal Garg, Bharat's Corporate and Allied Laws, 2013.
6. Institute of Company Secretaries of India, Companies Act 2013, CCH Wolter Kluwer Business, 2013
7. Saleem Sheikh & William Rees, Corporate Governance & Corporate Control, Cavendish Publishing Ltd., 1995
8. Taxmann, A Comparative Study of Companies Act 2013 and Companies Act 1956

**Evaluation Scheme:**

**Semester End Examination (A):**

*Theory:*

1. Question paper based on the entire syllabus will comprise of 5 questions (All compulsory, but with internal choice as appropriate), each carrying 15 marks, total summing up to 75 marks.

**Syllabus for Final Year of B.Tech. (Common for All Programs)**  
**Semester VIII (Autonomous)**  
**(Academic Year 2022-2023)**

2. Total duration allotted for writing the paper is 3 hrs.

***Continuous Assessment (B):***

*Theory:*

1. Two term tests of 25 marks each will be conducted during the semester out of which, one will be a compulsory term test (on minimum 02 Modules) and the other can either be a term test or an assignment on live problems or a course project.
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3. Average of the marks scored in both the two tests will be considered for final grading.