

Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)



Course Contents (Syllabus) for Second Year M. Tech. (Mechanical Production Engineering) Sem - III to IV

AY 2020-21

Title of the Course: Dissertation Phase I (3PR690) and Dissertation Phase II (3PR691 & 3PR692)
Pre-Requisite Courses:
Textbooks: As per the research topic.
References: National and International Journals

Course Objectives:

1. To develop the student to apply the knowledge gained to identify problem for research provide the solutions by self-study and interaction with stake holders.
2. Acquire knowledge to tackle real world problems of societal concerns.
3. Impart flexibility to the student to have increased control over his/ her learning.
4. Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor.
5. Enhance student's learning through increased interaction with peers and colleagues.

Course Learning Outcomes:

CO	After the completion of the course the student should be able to	Bloom's Cognitive	
		level	Descriptor
CO1	Search the existing literature and identification of research problem	IV	Analyzing
CO2	Design and develop the solution for complex engineering problem.	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1			1		2
CO2	1		1		2	1
CO3		2				1

Assessments:

Teacher Assessment:

In Semester Evaluation (ISE) and End Semester Evaluation (ESE)

Evaluation Scheme			
Scheme	Credits	Practical (Marks)	
		Max	Min for Passing
ISE I	4	100	40
ISE II	2	100	40
ESE I	4	100	40

Course Contents:

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects in this semester. The students are required to submit the dissertation work in the form of report as per the institute rule.

Professional Elective (Theory) Courses

Title of the Course: PE5: Material Handling Systems - 3PR611	L	T	P	Cr
	3	0	0	3

Pre-Requisite Courses:

Textbooks:

1. Jon R. Immer, "Material Handling", Mc-Graw Hill Company, 1950
2. Sharma, S. C., "Materials Management and Materials Handling" Khanna Publishers., 2004.
3. Dr.K.C.Arora, Vikas .V.Shinde," Aspects of Materials Handling", Laxmi Publishers, 2007.

References:

1. K.H.E. Kroemer, Karl Kroemer,"Ergonomics Design for Materials Handling systems", CRC Press, 1997.
2. Raymond A. Kulwiec, "Materials handling – Handbook", A Wiley – Inderscience publication" 1984.
3. Apple, J. M., "Plant Layout and material handling system design", John Wiley & Sons, 1995.

Course Objectives :

1. To develop a holistic, integrated approach to improve the material handling system considering the existing production system with constraints.
2. To provide the necessary inputs to students to make them capable to develop all the elements of selected material handling system.
3. To prepare the student for recommending the tailor made MHS for a particular application.

Course Learning Outcomes:

CO	Upon completion of this course the student will be able to	Bloom's Cognitive	
		level	Descriptor
CO1	Analyze material flows in plants and warehouses.	IV	Analyzing
CO2	Recommend the material handling systems as per the requirement of production system.	V	Evaluating
CO3	Design and develop material handling equipment's.	VI	Creating

CO-PO Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6
CO1			2		3	
CO2	2			2		
CO3		2				2

Assessments :

Teacher Assessment:

Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.

Assessment	Marks
ISE 1	10
MSE	30
ISE 2	10
ESE	50

ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.
MSE: Assessment is based on 50% of course content (Normally first three modules)
ESE: Assessment is based on 100% course content with 60-70% weightage for course content (normally last three modules) covered after MSE.

Course Contents:

Module 1 Plant Layout and Material Handling Principle	7 Hrs.
Plant Layout: Need for layout planning, Layout objectives and Determinants, Types of Layout, Computer Aided Plant Layout Planning: CRAFT, ALDEP, and CORELAP. Material Handling objective, benefits of better handling, relationship between layout and material handling, principles of Material Handling, Unit load concept, Material Handling Types, Equipment selection and Applications.	
Module 2 Mechanized Assembly	7 Hrs.
Principles and operating characteristics of part feeders such as vibratory bowl feeder, Reciprocating tube hopper feeder, Centrifugal hopper feeder, Center board hopper feeder, Orientation of parts : In bowl and out bowl tooling, different types of Escapement, Transfer Systems and Indexing Mechanism.	
Module 3 Material Transport and Storage System	6 Hrs.
Industrial trucks: non-powered and powered industrial trucks, AGVS: Types, Vehicle guidance technology, traffic and safety, Monorail and other rail guided vehicles, types of cranes, hoists and elevators.	
Module 4 Conveyors Types and Storage System	7 Hrs.
Belt conveyors, Slat conveyors, Gravity conveyors, Apron, escalators, pneumatic conveyors, screw conveyors, vibrating conveyor, Analysis of material transport system. Automated Storage system, AS/RS System, Carousel storage system, WIP storage system.	
Module 5 Packaging and Economic Analysis of Material Handling	6 Hrs.
Packaging: Functions, materials, palletizing, packaging equipment. Economic Analysis of material handling equipment: Factors in material handling selection, break event analysis, equipment operating cost per unit distance, work volume analysis – illustrative problems, productivity / indicator ratios.	
Module 6 Industrial applications	6 Hrs.
Lean-based material handling, Advanced material handling equipment, Design of MHS for industries like Foundries, Forging industries, Assembly plants etc. (with plant layout and cost estimation)	

Module wise Measurable Students Learning Outcomes :

Students should be able to

1. Plan the plant layout and flow of material in the production shop.
2. Compare the different equipment for mechanized assembly.
3. Analyze various material transport and storage systems.
4. Select the conveyors and storage system.
5. Apply the economic analysis of material handling.
6. Design of MHS in different industries.

Title of the Course: PE5: Manufacturing Planning and Control - 3PR612	L	T	P	Cr
	3	0	0	3

Pre-Requisite Courses:

Textbooks:

1. D. D. Bedworth and J. E. Bailey, Integrated Production Control System- Management, Analysis and Design, John Wiley. (1983)
2. E. A. Elsayed and T. O. Boucher, Analysis and Control of Production Systems, Prentice Hall. (1985)
3. M. Pinedo and X. Chao, Operations Scheduling, McGraw Hill, (1999)
4. R. B. Chase, N. J. Aamilano and F. R. Jacobs, Production and Operations Management- Manufacturing and Services, Tata McGraw Hill, Second Edition. (1999)

References:

1. H. Noori and R. Radford, Production and Operations Management, McGraw Hill Inc., (1995)
2. S. Nahmias, Production and Operations Analysis, R. Irwin., (1997)
3. K. Hitomi, Manufacturing Systems Engineering, Viva Books Pvt. Ltd, India., (1996)

Course Objectives :

Students should get an exposure to the various manufacturing systems and do proper planning and further exercise control for proper execution. Teacher should discuss various case studies. Students should be given some situations and should be asked to do brain storming in groups and give possible solutions.

Course Learning Outcomes:

CO	After the completion of the course the student should be able to	Bloom's Cognitive	
		level	Descriptor
CO1	Perceive the manufacturing systems, the approach to pre planning and required decision making for the same with the help of case studies	II	Understand
CO2	Perceive about the planning activity, MRP and operations and apply the same for a manufacturing system as a case study	III	apply
CO3	Study and perceive the international scenario and recent trends	IV	Analyzing

CO-PO Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6
CO1			3	2		
CO2	3			2		
CO3					3	2

Assessments :

Teacher Assessment:

Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.

Assessment	Marks
ISE 1	10
MSE	30
ISE 2	10
ESE	50

ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.

MSE: Assessment is based on 50% of course content (Normally first three modules)

ESE: Assessment is based on 100% course content with 70-80% weightage for course content (normally last three modules) covered after MSE.

Course Contents:	
Module 1 Manufacturing Systems	7 Hrs.
Overview of manufacturing systems and various issues of interest: Assembly Line, Repetitive batch manufacturing, Cellular manufacturing, Flexible Manufacturing Systems, Just in Time, Computer Integrated Manufacturing	
Module 2 Preplanning and Decision Making	6 Hrs.
Preplanning: Forecasting, Economic analysis, Aggregate planning, Capacity planning Inventory planning. Decision making in design of manufacturing systems : Group Technology, Line balancing, Plant layout.	
Module 3 Operations Planning	6 Hrs.
Operations planning : MRP (Materials Requirement Planning), MRP II (Manufacturing Resource Planning), Hierarchical planning systems, JIT systems, FMS	
Module 4 Operations and Control	7 Hrs.
Operation and control: Lot sizing decisions, production scheduling, line of balance, quality planning and control, cost planning and control, productivity planning and control and applications of theory of constraints.	
Module 5 World class manufacturing	6 Hrs.
Road map to World Class Manufacturing Systems: Ideal Manufacturing, Intelligent Manufacturing and Agile Manufacturing Systems.	
Module 6 Recent development	7 Hrs.
Applications of recent developments in IT including ERP, e-Business, Enterprise Applications Integration (EAI) and Virtual Manufacturing: Concepts, Justification and Status of development and implementation.	
Module wise Measurable Students Learning Outcomes : After the completion of the course the student should be able to <ol style="list-style-type: none"> 1. Perceive and describe the various manufacturing systems 2. Students should be able to note and use the approach towards pre planning and decision making in design of systems 3. Student should perceive and get to know the hierarchy of operations and MRP 4. Students should be able to do the scheduling, quality planning and understand constraints 5. Students will be able to interpret and follow world class manufacturing 6. Student should know the recent development in the field of MPC 	

Title of the Course: PE5: Organizational Behaviour - 3PR613			L	T	P	Cr	
			3	0	0	3	
Pre-Requisite Courses:							
Textbooks:							
1. Robbins, Judge & Sanghi , Organizational Behaviour, Pearson EducationPublication.2013							
2. Stephen Robbins, OrganisationalBehaviour, Prentice Hall of India, 2008							
3. Udai Pareek,Understanding OrganisationalBehaviour, Oxford University Press, 2004							
References:							
1. L.M.Prasad , Organizational Behaviour, Sultan Chand & Sons, 2014							
2. Fred Luthans,Organizational Behaviour, McGraw Hill Book Co., 2010							
Course Objectives :							
1. To understand the implications of individual and group behaviour in organizational context.							
2. To understand effect of personality, values, decision making and motivation on organizational behaviour.							
3. To know leadership and it'suse in conflict management and negotiations.							
Course Learning Outcomes:							
CO	After the completion of the course the student should be able to					Bloom's Cognitive	
						level	Descriptor
CO1	Grasp and perceive the concept of Organisational Behaviour and its effect on functioning of the organisation					II	Understand
CO2	Compare and perceive group behaviour, communication and leadership, and apply the same in conflict management and negotiations.					III	Apply
CO3	Analysis, through various case studies, the contribution of various human attributes / qualities on performance of organisation					IV	Analyse
CO-PO Mapping :							
	PO1	PO2	PO3	PO4	PO5	PO6	
CO1				2		1	
CO2					3	2	
CO3			2	2			
Teacher Assessment:							
Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.							
Assessment				Marks			
ISE 1				10			
MSE				30			
ISE 2				10			
ESE				50			
ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.							
MSE: Assessment is based on 50% of course content (Normally first three modules)							
ESE: Assessment is based on 100% course content with 70-80% weightage for course content (normally last three modules) covered after MSE.							
Course Contents:							
Module 1 What is Organizational Behaviour?							
7 Hrs.							

Understanding Organizational Behaviour, Effectiveness in organizations, Importance of interpersonal skills, A review of the manager's job, Disciplines that contribute to the OB field, Challenges and opportunities for OB, Basic OB model	
Module 2 Diversity in Organizations, Attitudes and Job Satisfaction	6 Hrs.
Concept of diversity, Biographical Characteristics, Intellectual and physical abilities, Diversity management strategies, Main components of attitudes, Causes of job satisfaction, Measure of job satisfaction, Outcomes influenced by job satisfaction,	
Module 3 Emotions and Moods	6 Hrs.
What are Emotions and Moods?, difference between emotions and moods, Sources of emotions and moods, Strategies for emotion regulation, Emotional Intelligence, Applications of Emotions and Moods	
Module 4 Personality and Values, Decision Making, Motivation	7 Hrs.
What is personality?, Factors that determine personality, Personality and behaviour at work place, Values and importance of values, Perception and individual decision making, Decision making in organizations, Factors affecting decision making, Definition of motivation, Maslow's Hierarchy of Needs theory,	
Module 5 Group behaviour, Communication	6 Hrs.
Need to form groups, Group properties: Roles, Norms, Status, Size, Cohesiveness, and Diversity, Group decision making and techniques, The communication process, Types of interpersonal communication, Barriers to effective communication	
Module 6 Leadership, Conflict Management and Negotiation	7 Hrs.
What is leadership?, Qualities of a leader, Charismatic leadership and transformational leadership, Definition of conflict, The conflict process and various stages, Negotiation, Bargaining strategies, Negotiation process, Organizational change, Forces for change, Creating a culture for change	
Module wise Measurable Students Learning Outcomes : After the completion of the course the student should be able to: <ol style="list-style-type: none"> 1. Grasp what is organisational behaviour and challenges and opportunities of OB 2. Perceive the diversities in organisation, components of attitude and job satisfaction 3. Compare and explain how emotions and moods can affect the OB and perceive what is emotional intelligence 4. Figure out and analyse personality, values decision making and motivation and effect on OB 5. Illustrate need of forming a group and analyse what are group properties, perceive the use of effective communication at various places. 6. Study and apply leadership skills and use it in conflict management and negotiations. 	

Title of the Course: PE 5: Flexible Manufacturing Systems - 3PR614		L	T	P	Cr	
		3	0	0	3	
Pre-Requisite Courses:						
Textbooks:						
1. William W Luggen, “Flexible Manufacturing Cells and System” Prentice Hall of Inc New Jersey, 1991						
2. Reza A Maleki “Flexible Manufacturing system” Prentice Hall of Inc New Jersey, 1991						
References:						
1. John E Lenz “Flexible Manufacturing” marcel Dekker Inc New York ,1989						
2. Groover, M.P “Automation, Production Systems and Computer Integrated Manufacturing”, Prentice Hall of India Pvt.Ltd. New Delhi 2009						
Course Objectives :						
1.To impart the knowledge of the fundamentals of flexible manufacturing systems and other different types of manufacturing systems.						
2.To prepare the student for the use of the recent developments in manufacturing such as machining centres and co-ordinate measuring machines, etc.						
3.. To enable the student for selection of appropriate method of automatic storage systems and cutting tool management techniques.						
Course Learning Outcomes:						
CO	After the completion of the course the student should be able to	Bloom’s Cognitive				
		level	Descriptor			
CO1	Classify and distinguish FMS and other manufacturing systems including job-shop and mass production systems.	II	Understanding			
CO2	Explain processing stations and material handling systems used in FMS environments	IV	Analyzing			
CO3	Recommend tool management in FMS.	V	Evaluating			
CO-PO Mapping :						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		2	2			
CO2			2		2	
CO3				2		2
Assessments :						
Teacher Assessment:						
Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.						
Assessment			Marks			
ISE 1			10			
MSE			30			
ISE 2			10			
ESE			50			

<p>ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.</p> <p>MSE: Assessment is based on 50% of course content (Normally first three modules)</p> <p>ESE: Assessment is based on 100% course content with 70-80% weightage for course content (normally last three modules) covered after MSE.</p>	
Course Contents:	
Module 1	7 Hrs.
Introduction: Limitations with conventional manufacturing, Need for FMS Introduction, Definition, Basic Component of FMS, Significance of FMS, General layout and configuration of FMS, Principle Objectives of FMS, Benefits and limitations of FMS, Area of Application of a FMS in Industry, Various Hardware and Software required for an FMS, CIM Technology, Hierarchy of CIM, FMS Justification	
Module 2	7 Hrs.
Manufacturing Cell: Introduction, Description and Classifications of Cell, Unattended Machining, Cellular versus Flexible Manufacturing: Group Technology: Introduction, Definition, Reasons for Adopting Group Technology, Benefits of Group Technology Affecting Many Areas of a Company, Obstacles to Application of GT	
Module 3	7 Hrs.
Turning and Machining Centres: Introduction, Types, Construction and Operation Performed on Turning center, Automated Features and Capabilities of Turning Centres, General Advantages and Disadvantages of Vertical and Horizontal Machining Centres, Pallet and Part Loading and Programming Options in Machining Centres, Automated features and capabilities of a Machining Centres	
Module 4	6 Hrs.
Coordinate Measuring Machines: Introduction, Types, Construction and General Functions of CMM, Operational Cycle Description, CMM Applications, Importance to Flexible Cells and Systems	
Module 5	6 Hrs.
Automated Material Movement and Storage System: Introduction, Types of AGV and Their principle of working, Advantages, Limitation and General AGV Guide path, Robots, Benefits of using Industrial Robots, Basic components and benefits of Automated Storage and Retrieval Systems, Conveyors and Pallet Flotation System, Queuing Carrousel and Automatic Work Changers, Coolant and Chip Disposal and Recovery system.	
Module 6	7 Hrs.
Cutting Tools and Tool Management: Introduction, Control of Cutting Tools, Tool Management, Tool Strategies, Tool Preset, Identification and Data Transfer, Tool Monitoring and Fault Detection: FMS Installation and Implementation: FMS Installation, FMS implementation.	
<p>Module wise Measurable Students Learning Outcomes :</p> <p>After the completion of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Summarize the traditional and flexible manufacturing systems and applications / limitations, characteristics, of flexible manufacturing systems. 2. Explain the manufacturing cell and group technology concepts. 3. Distinguishing the different types of machining centres, their various features and programming methods of the same. 4. Demonstrate CMM and will be able to use CMM for inspection of components. 5. Explain modern material handling and storage systems used in manufacturing industry. 6. Use the modern tool management system. 	

Title of the Course: PE5:Digital Manufacturing and Industry 4.0 - 3PR615	L	T	P	Cr
	3	0	0	3

Pre-Requisite Courses:

Textbooks:

- Lane Thames, Dirk Schaefer, “Cyber security for Industry 4.0: Analysis for Design and Manufacturing”, Springer Series in Advanced Manufacturing by Publisher: Springer; 1st ed. 2017 edition (May 6, 2017)
- Tessaleno Devezas, Askar Sarygulov, “Industry 4.0: Entrepreneurship and Structural Change in the New Digital Landscape” by Publisher: Springer; 1st ed. 2017 edition (March 2, 2017)

References:

- Klaus Schwab, “The Fourth Industrial Revolution” by Publisher: Crown Business (January 3, 2017).
- Luan Casagrande, Vilson Gruber and Roderval Marcelino, “IoT and the Industry 4.0: Principles and Educational Applications”, Publisher: Scholars’ Press (October 7, 2016).

Course Objectives :

- To illustrate the knowledge to students on various concepts of digital manufacturing and industry 4.0
- To evolve towards interdisciplinary approach, to incorporate communication and information technologies.
- To develop skills, those allow students to adopt skills related to digital manufacturing and industry 4.0

Course Learning Outcomes:

CO	After the completion of the course the student should be able to	Bloom’s Cognitive	
		level	Descriptor
CO1	Illustrate concepts of digital manufacturing and industry 4.0	III	Applying
CO2	Recommend the communication and information technologies	V	Evaluating
CO3	Produce programs for small part of digital manufacturing.	VI	Create

CO-PO Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6
CO1			1			
CO2			3			1
CO3					3	

Assessments :

Teacher Assessment:

Two components of In Semester Evaluation (ISE), One Mid Semester Examination (MSE) and one End Semester Examination (ESE) having 20%, 30% and 50% weights respectively.

Assessment	Marks
ISE 1	10
MSE	30

ISE 2	10
ESE	50
<p>ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.</p> <p>MSE: Assessment is based on 50% of course content (Normally first three modules)</p> <p>ESE: Assessment is based on 100% course content with 70-80% weightage for course content (normally last three modules) covered after MSE.</p>	
Course Contents:	
Module 1	6 Hrs.
The Various Industrial Revolutions, Digitalisation and the Networked Economy, Drivers, Enablers, Compelling Forces and Challenges for Industry 4.0, The Journey so far: Developments in USA, Europe, China and other countries, Comparison of Industry 4.0 Factory and Today's Factory, Trends of Industrial Big Data and Predictive Analytics for Smart Business Transformation	
Module 2	7 Hrs.
Internet of Things (IoT) & Industrial Internet of Things (IIoT) & Internet of Services, Smart Manufacturing, Smart Devices and Products, Smart Logistics, Smart Cities, Predictive Analytics.	
Module 3	6 Hrs.
Cyberphysical Systems, Robotic Automation and Collaborative Robots, Support System for Industry 4.0, Mobile Computing, Related Disciplines, Cyber Security	
Module 4	7 Hrs.
Resource-based view of a firm, Data as a new resource for organizations, Harnessing and sharing knowledge in organizations, Cloud Computing Basics, Cloud Computing and Industry 4.0	
Module 5	6 Hrs.
Industry 4.0 laboratories, IIoT case studies.	
Module 6	7 Hrs.
Opportunities and Challenges, Future of Works and Skills for Workers in the Industry 4.0 Era, Strategies for competing in an Industry 4.0 world.	
<p>Module wise Measurable Students Learning Outcomes :</p> <p>After the completion of the course the student should be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate Industry 4.0 concepts and technologies. 2. Justify the role of Digital Manufacturing in industry 3. Explain the requirements for Robotic automation and Cyber security. 4. Describe the structures of resource management. 5. Create the mini applications of IoT or IIoT for industry 4.0. 6. Study the fundamentals of strategies for competing in an Industry 4.0. 	

Mandatory Non Credit Courses

Title of the Course: Constitution of India 3IC601		L	T	P	Cr		
		02	-	-	-		
Pre-Requisite Courses: -							
Textbooks:							
1. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.							
2. M. P. Jain, Indian Constitution Law, 7 th Edn., Lexis Nexis, 2014.							
3. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.							
References:							
1. The Constitution of India, 1950 (Bare Act), Government Publication							
Course Objectives :							
The objectives of the course are:							
1. To review and create awareness on various provisions in the constitution of India.							
Course Learning Outcomes:							
CO	After the completion of the course the student should be able to	Bloom’s Cognitive					
		level	Descriptor				
CO1	Explain the premises informing the twin themes of liberty and freedom from a civil rights perspective.	2	Understanding				
CO2	Address the growth of Indian opinion regarding modern Indian intellectuals’ constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.	2	Understanding				
CO3	Address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.	2	Understanding				
CO-PO Mapping :							
		1	2	3	4	5	6
	CO1						
	CO2						
	CO3						
Assessments :							
Teacher Assessment:							

Two components of In Semester Evaluation (ISE), and One Mid Semester Examination (MSE) having 35%, 35% and 30% weights respectively.

Assessment	Marks
ISE 1	35
MSE	30
ISE 2	35

ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.

MSE: Assessment is based on 50% of course content (Normally first three modules)

Course Contents:

Module 1	4 Hrs.
History of Making of the Indian Constitution Drafting Committee, (Composition & Working)	
Module 2 Philosophy of the Indian Constitution	4 Hrs.
Preamble, Salient Features	
Module 3 Contours of Constitutional Rights & Duties	5 Hrs.
Fundamental Rights; Right to Equality; Right to Freedom; Right against Exploitation; Right to Freedom of Religion; Cultural and Educational Rights; Right to Constitutional Remedies; Directive Principles of State Policy; Fundamental Duties.	
Module 4 Organs of Governance	5 Hrs.
Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers	
Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions	
Module 5 Local Administration	5 Hrs.
District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: ZilaPachayat. Elected officials and their roles, CEO ZilaPachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy	
Module 6 Election Commission	5 Hrs.
Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.	

Title of the Course: Pedagogy Studies 3IC602	L	T	P	Cr		
	02	-	-	-		
Pre-Requisite Courses: -						
Textbooks:						
1. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36 (3): 361-379.						
2. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.						
3. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272–282.						
4. Chavan M (2003) Read India: A mass scale, rapid, ‘learning to read’ campaign.						
5. www.pratham.org/images/resource%20working%20paper%202.pdf.						
References:						
1. Alexander RJ, 2001, Culture and pedagogy: International comparisons in primary education, Oxford and Boston: Blackwell.						
2. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.						
Course Objectives :						
The objectives of the course are:						
1. To discuss pedagogical practices being used by teachers in formal and informal classrooms in developing countries.						
2. To provide the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners.						
3. To explain teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy.						
Course Learning Outcomes:						
CO	After the completion of the course the student should be able to	Bloom’s Cognitive				
		level	Descriptor			
CO1	Outline pedagogical practices, and existing evidence on the review topic to inform programme design and policy making undertaken.	2	Understanding			
CO2	Explain critical evidence gaps to guide the development	2	Understanding			
CO-PO Mapping :						
	1	2	3	4	5	6
CO1						

Title of the Course: Disaster Management 3IC603	L	T	P	Cr		
	02	-	-	-		
Pre-Requisite Courses: -						
Textbooks: 1. R. Nishith, Singh AK, “Disaster Management in India: Perspectives, issues and strategies “New Royal book Company. 2. Sahni, PardeepEt.Al. (Eds.),” Disaster Mitigation Experiences And Reflections”, Prentice Hall Of India, New Delhi. 3. Goel S. L., Disaster Administration And Management Text And Case Studies”,Deep &Deep						
Course Objectives : The objectives of the course are: 1. To impart knowledge for critical understanding of key concepts in disaster risk reduction and humanitarian response, and disaster management approaches 2. Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives. 3. Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations. 4. Critically understand the strengths and weaknesses of, planning and programming in different countries, particularly their home country or the countries they work in						
Course Learning Outcomes:						
CO	After the completion of the course the student should be able to	Bloom’s Cognitive				
		level	Descriptor			
CO1	Explain disaster risk reduction and humanitarian response policy and practice from multiple perspectives	2	Understanding			
CO2	Summarize standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.	2	Understanding			
CO3	Outline the strengths and weaknesses of disaster management approaches, planning and programming in different countries.	2	Understanding			
CO-PO Mapping :						
	1	2	3	4	5	6
CO1						
CO2						
CO3						

Assessments :	
Teacher Assessment:	
Two components of In Semester Evaluation (ISE), and One Mid Semester Examination (MSE) having 35%, 35% and 30% weights respectively.	
Assessment	Marks
ISE 1	35
MSE	30
ISE 2	35
ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.	
MSE: Assessment is based on 50% of course content (Normally first three modules)	
Module 1 Introduction	4 Hrs.
Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.	
Module 2 Repercussions Of Disasters And Hazards	4 Hrs.
Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.	
Module 3 Disaster Prone Areas In India	4 Hrs.
Study Of Seismic Zones; Areas Prone To Floods and Droughts, Landslides and Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics	
Module 4 Disaster Preparedness And Management	4 Hrs.
Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness.	
Module 5 Risk Assessment	4 Hrs.
Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment and Warning, People's Participation In Risk Assessment. Strategies for Survival.	
Module 6 Disaster Mitigation	4 Hrs.
Meaning, Concept and Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.	

Title of the Course: Value Education 3IC604		L	T	P	Cr		
		02	-	-	-		
Pre-Requisite Courses: -							
Textbooks: 1. Chakroborty, S.K. “Values and Ethics for organizations Theory and practice”, Oxford University Press, New Delhi							
Course Objectives : The objectives of the course are: 1. To impart knowledge on value of education and self- development. 2. To imbibe good values in students. 3. To highlight importance of character.							
Course Learning Outcomes:							
CO	After the completion of the course the student should be able to	Bloom’s Cognitive					
		level	Descriptor				
CO1	Explain value of education and self- development.	2	Understanding				
CO2	Summarize importance of good character, and Behavior development.	2	Understanding				
CO-PO Mapping :							
		1	2	3	4	5	6
CO1							
CO2							
CO3							
Assessments : Teacher Assessment: Two components of In Semester Evaluation (ISE), and One Mid Semester Examination (MSE) having 35%, 35% and 30% weights respectively.							
Assessment				Marks			
ISE 1				35			
MSE				30			
ISE 2				35			

ISE 1 and ISE 2 are based on assignment/declared test/quiz/seminar etc.	
MSE: Assessment is based on 50% of course content (Normally first three modules)	
Module 1	6Hrs.
<ol style="list-style-type: none"> 1. Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. 2. Moral and non- moral valuation. Standards and principles. 3. Value judgments 	
Module 2	6 Hrs.
<ol style="list-style-type: none"> 1. Importance of cultivation of values 2. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. 3. Honesty, Humanity. Power of faith, National Unity. 4. Patriotism. Love for nature, Discipline 	
Module 3	7 Hrs.
<ol style="list-style-type: none"> 1. Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline. 2. Punctuality, Love and Kindness. 3. Avoid fault Thinking. 4. Free from anger, Dignity of labour. 5. Universal brotherhood and religious tolerance. 6. True friendship. 7. Happiness Vs suffering, love for truth. 8. Aware of self-destructive habits. 9. Association and Cooperation. 10. Doing best for saving nature 	
Module 4	7 Hrs.
<ol style="list-style-type: none"> 1. Character and Competence –Holy books vs Blind faith. 2. Self-management and Good health. 3. Science of reincarnation. 4. Equality, Nonviolence, Humility, Role of Women. 5. All religions and same message. 6. Mind your Mind, Self-control. 7. Honesty, Studying effectively 	

EVEN Semester

**Professional Core (Lab)
Courses**

Title of the Course: Dissertation Phase III (3PR693)and Dissertation Phase IV (3PR694 & 3PR695)		L	T	P	Cr		
		0	0	5	4+12		
Pre-Requisite Courses:							
Textbooks: As per the research topic							
References: National and International Journals							
Course Objectives:							
1. To develop the student to apply the knowledge gained to identify problem for research provide the solutions by self-study and interaction with stake holders.							
2. Acquire knowledge to tackle real world problems of societal concerns.							
3. Impart flexibility to the student to have increased control over his/ her learning.							
4. Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor.							
5. Enhance student’s learning through increased interaction with peers and colleagues.							
Course Learning Outcomes:							
CO	After the completion of the course the student should be able to	Bloom’s Cognitive					
		level	Descriptor				
CO1	Search the existing literature and identification of research problem	IV	Analyzing				
CO2	Design and develop the solution for complex engineering problem.	V	Evaluating				
CO3	Create the new knowledge in the specialized field	VI	Creating				
CO-PO Mapping:							
		PO1	PO2	PO3	PO4	PO5	PO6
	CO1	1			1		2
	CO2	1		1		2	2
	CO3		2				2
Assessments:							
Teacher Assessment:							
In Semester Evaluation (ISE) and End Semester Evaluation (ESE)							
Evaluation Scheme							
Scheme		Credits			Practical (Marks)		

		Max	Min for Passing
ISE I	4	100	40
ISE II	4	100	40
ESE I	8	100	40

Course Contents:

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects in this semester. The students are required to submit the dissertation work in the form of report as per the institute rule.

Value Added

Professional Courses

There are no courses under this category for this semester.

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