D. Y. Patil College of Engineering & Technology

Kasaba Bawada, Kolhapur

M. Tech. Programme Structure (Autonomous)

(Department of Computer Science & Engineering)

2021-22

D. Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY, KOLHAPUR

Teaching and Evaluation Scheme from Year 2021-22

Second Year M. Tech. Computer Science & Engineering

SEMESTER-III

Sr. No.	Course Code	Course Type	Name of the Course	Teaching Scheme per Week				Total Marks	Evaluation Scheme			
				Lecture	Tutorial	Practical	Credits		Type	Max.Marks	Min. Marks for Passing	
1	202CSL701	PE	Program Elective – V*	-	2	-	2	100	ISE	100	40	**40**
2	202CSL711	OE	Open Elective*	-	2	-	2	100	ISE	100	40	40
3	202CSP721	PROJ	Dissertation Phase - I	-	-	24	12	100	ISE	50	20	**40**
									ESE-OE	50	20	
			Total:	**0**	**4**	**24**	**16**	**300**		**300**		
					28							

*Students going for Industrial Project/ Dissertation Phase - I will complete these courses through MOOCs

Open Elective:

1. 202CSL711   Business Analytics
2. 202CSL712   Industrial Safety
3. 202CSL713   Operations Research
4. 202CSL714   Cost Management of Engineering Projects
5. 202CSL715   Composite Materials
6. 202CSL716   Waste to Energy.

D. Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY, KOLHAPUR

Teaching and Evaluation Scheme from Year 2021-22

Second Year M. Tech. Computer Science & Engineering

SEMESTER-IV

Sr. No.	Course Code	Course Type	Name of the Course	Teaching Scheme per Week				Total Marks	Evaluation Scheme		
				Lecture	Tutorial	Practical	Credits		Type	Max.Mark	Min. Marks for Passing
1	202CSP723	PROJ	Dissertation Phase- II	0	0	32	16	**200**	ISE	100	40
									ESE - OE	100	40
			Total:	**0**	**0**	**32**	**16**	**200**		**200**	
					32						

SEMESTER-III

Course Title : **Program Elective – V**	
Course Code : 202CSL701	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

- Students should choose Program Elective-V based on the domain related to the dissertation topic from available MOOC courses like Swayam, NPTEL, etc. with prior permission from the guide and HoD.
- The ISE marks will be based on the Certification Score issued by the concerned MOOC authority.
- In case, the Certification Exam is not conducted by respective authority before the end of the semester then the ISE evaluation will be based on the performance in the assignments conducted by the concerned MOOC authority.

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Open Elective

Course Title : **Open Elective**	
Course Code : -	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

- Students should choose Open Elective based on the following list of courses or domain of Multi Disciplinary studies from available MOOC courses like Swayam, edx, IITBombayX, etc. with prior written permission from the HoD.
- The ISE marks will be based on the Certification Score issued by the concerned MOOC authority.
- In case, the Certification Exam is not conducted by respective authority before the end of the semester then the ISE evaluation will be based on the performance in the assignments evaluated by the concerned MOOC authority.
- If Open Elective courses motioned below are taken by the students then it will be evaluated by concerned subject expert based on the minimum 10 assignments on continuous basis for 100 marks.

Open Elective:
1. 202CSL711   Business Analytics
2. 202CSL712   Industrial Safety
3. 202CSL713   Operations Research
4. 202CSL714 Cost Management of Engineering Projects
5. 202CSL715 Composite Materials
6. 202CSL716 Waste to Energy.

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Course Title : **Open Elective -** Business Analytics	
Course Code : 202CSL711	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

COURSE OBJECTIVE

1. Understand the role of business analytics within an organization.
2. Analyze data using statistical and data mining techniques and understand relationships between the underlying business processes of an organization.
3. To gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
4. To become familiar with processes needed to develop, report, and analyze business data.
5. Use decision-making tools/Operations research techniques.
6. Mange business process using analytical and management tools.
7. Analyze and solve problems from different industries such as manufacturing, service, retail, software, banking and finance, sports, pharmaceutical, aerospace etc.

COURSE OUTCOMES

After completion of course, students would be able to:

1. Students will demonstrate knowledge of data analytics.
2. Students will demonstrate the ability of think critically in making decisions based on data and deep analytics.
3. Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making.
4. Students will demonstrate the ability to translate data into clear, actionable insights.

Pre-Requisites	-

Course Contents

Unit 1:
Business analytics: Overview of Business analytics, Scope of Business analytics, Business Analytics Process, Relationship of Business Analytics Process and organisation, competitive advantages of Business Analytics. Statistical Tools: Statistical Notation, Descriptive Statistical methods, Review of probability distribution and data modelling, sampling and estimation methods overview

Unit 2:
Trendiness and Regression Analysis: Modelling Relationships and Trends in Data, simple Linear Regression. Important Resources, Business Analytics Personnel, Data and models for Business analytics, problem solving, Visualizing and Exploring Data, Business Analytics Technology.

Unit 3:
Organization Structures of Business analytics, Team management, Management Issues, Designing Information Policy, Outsourcing, Ensuring Data Quality, Measuring contribution of Business analytics, Managing Changes. Descriptive Analytics, predictive analytics, predicative Modelling, Predictive analytics analysis, Data Mining, Data Mining Methodologies, Prescriptive analytics and its step in the business analytics Process,

Prescriptive Modelling, nonlinear Optimization.
Unit 4:
Forecasting Techniques: Qualitative and Judgmental Forecasting, Statistical Forecasting Models, Forecasting Models for Stationary Time Series, Forecasting Models for Time Series with a Linear Trend, Forecasting Time Series with Seasonality, Regression Forecasting with Casual Variables, Selecting Appropriate Forecasting Models. Monte Carlo Simulation and Risk Analysis: Monte Carle Simulation Using Analytic Solver Platform, New-Product Development Model, Newsvendor Model, Overbooking Model, Cash Budget Model..
Unit 5:
Decision Analysis: Formulating Decision Problems, Decision Strategies with the without Outcome Probabilities, Decision Trees, The Value of Information, Utility and Decision Making.
Unit 6:
Recent Trends in : Embedded and collaborative business intelligence, Visual data recovery, Data Storytelling and Data journalism..
Reference Books
1. Business analytics Principles, Concepts, and Applications by Marc J. Schniederjans, Dara G. Schniederjans, Christopher M. Starkey, Pearson FT Press.   2. Business Analytics by James Evans, persons Education.

Course Title : **Open Elective -** Industrial Safety	
Course Code : 202CSL712	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

Pre-Requisites	-

Course Contents
Unit 1:
Industrial safety: Accident, causes, types, results and control, mechanical and electrical hazards, types, causes and preventive steps/procedure, describe salient points of factories act 1948 for health and safety, wash rooms, drinking water layouts, light, cleanliness, fire, guarding, pressure vessels, etc, Safety color codes. Fire prevention and firefighting, equipment and methods.
Unit 2:
Fundamentals of maintenance engineering: Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment.
Unit 3:
Wear and Corrosion and their prevention: Wear- types, causes, effects, wear reduction methods, lubricants-types and applications, Lubrication methods, general sketch, working and applications, i. Screw down grease cup, ii. Pressure grease gun, iii. Splash lubrication, iv. Gravity lubrication, v. Wick feed lubrication vi. Side feed lubrication, vii. Ring lubrication, Definition, principle and factors affecting the corrosion. Types of corrosion, corrosion prevention methods.

Unit 4:
Fault tracing: Fault tracing-concept and importance, decision tree concept, need and applications, sequence of fault-finding activities, show as decision tree, draw decision tree for problems in machine tools, hydraulic, pneumatic, automotive, thermal and electrical equipment's like, I. Any one machine tool, ii. Pump iii. Air compressor, iv. Internal combustion engine, v. Boiler, vi. Electrical motors, Types of faults in machine tools and their general causes.

Unit 5:
Periodic and preventive maintenance: Periodic inspection-concept and need, degreasing, cleaning and repairing schemes, overhauling of mechanical components, overhauling of electrical motor, common troubles and remedies of electric motor, repair complexities and its use, definition, need, steps and advantages of preventive maintenance. Steps/procedure for periodic and preventive maintenance of: I. Machine tools, ii. Pumps, iii. Air compressors, iv. Diesel generating (DG) sets, Program and schedule of preventive maintenance of mechanical and electrical equipment, advantages of preventive maintenance. Repair cycle concept and importance.

Reference Books
1. Maintenance Engineering Handbook, Higgins & Morrow, Da Information Services.
2. Maintenance Engineering, H. P. Garg, S. Chand and Company.
3. Pump-hydraulic Compressors, Audels, Mcgrew Hill Publication.
4. Foundation Engineering Handbook, Winterkorn, Hans, Chapman & Hall London.

Course Title : **Open Elective -** Operations Research	
Course Code : 202CSL713	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

COURSE OUTCOMES
After completion of course, students would be able to:
1. Students should able to apply the dynamic programming to solve problems of discreet and continuous variables.
2. Students should able to apply the concept of non-linear programming
3. Students should able to carry out sensitivity analysis
4. Student should able to model the real-world problem and simulate it.

Pre-Requisites	-

Course Contents
Unit 1:
Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models
Unit 2:
Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming
Unit 3:
Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem - CPM/PERT.
Unit 4:

Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.

Unit 5:
Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation

Reference Books

1. H.A. Taha, Operations Research, An Introduction, PHI, 2008
2. H.M. Wagner, Principles of Operations Research, PHI, Delhi, 1982.
3. J.C. Pant, Introduction to Optimization: Operations Research, Jain Brothers, Delhi, 2008
4. Hitler Libermann Operations Research: McGraw Hill Pub. 2009
5. Pannerselvam, Operations Research: Prentice Hall of India 2010
6. Harvey M Wagner, Principles of Operations Research: Prentice Hall of India 2010

Course Title : **Open Elective -** Cost Management of Engineering Projects	
Course Code : 202CSL714	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

Pre-Requisites	-

Course Contents

Unit 1:
Introduction and Overview of the Strategic Cost Management Process

Unit 2:
Cost concepts in decision-making; Relevant cost, Differential cost, Incremental cost and Opportunity cost. Objectives of a Costing System; Inventory valuation; Creation of a Database for operational control; Provision of data for Decision-Making.

Unit 3:
Project: meaning, Different types, why to manage, cost overruns centres, various stages of project execution: conception to commissioning. Project execution as conglomeration of technical and non technical activities. Detailed Engineering activities. Pre project execution main clearances and documents Project team: Role of each member. Importance Project site: Data required with significance. Project contracts. Types and contents. Project execution Project cost control. Bar charts and Network diagram. Project commissioning: mechanical and process

Unit 4:
Cost Behavior and Profit Planning Marginal Costing; Distinction between Marginal Costing and Absorption Costing; Break-even Analysis, Cost-Volume-Profit Analysis. Various decision-making problems. Standard Costing and Variance Analysis. Pricing strategies: Pareto Analysis. Target costing, Life Cycle Costing. Costing of service sector. Just-in-time approach, Material Requirement Planning, Enterprise Resource Planning, Total Quality Management and Theory of constraints. Activity-Based Cost Management, Bench Marking; Balanced Score Card and Value-Chain Analysis. Budgetary Control; Flexible Budgets; Performance budgets; Zero-based budgets. Measurement of Divisional profitability pricing decisions including transfer pricing.

Unit 5:

Quantitative techniques for cost management, Linear Programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, Learning Curve Theory

Reference Books
1. Cost Accounting A Managerial Emphasis, Prentice Hall of India, New Delhi
2. Charles T. Horngren and George Foster, Advanced Management Accounting
3. Robert S Kaplan Anthony A. Alkinson, Management & Cost Accounting
4. Ashish K. Bhattacharya, Principles & Practices of Cost Accounting A. H. Wheeler publisher
5. N.D. Vohra, Quantitative Techniques in Management, Tata McGraw Hill Book Co. Ltd.

Course Title : **Open Elective -** Composite Materials	
Course Code : 202CSL715	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

Pre-Requisites	-

Course Contents
Unit 1: INTRODUCTION: Definition – Classification and characteristics of Composite materials. Advantages and application of composites. Functional requirements of reinforcement and matrix. Effect of reinforcement (size, shape, distribution, volume fraction) on overall composite performance.
Unit 2: REINFORCEMENTS: Preparation-layup, curing, properties and applications of glass fibers, carbon fibers, Kevlar fibers and Boron fibers. Properties and applications of whiskers, particle reinforcements. Mechanical Behavior of composites: Rule of mixtures, Inverse rule of mixtures. Isostrain and Isostress conditions.
Unit 3: Manufacturing of Metal Matrix Composites: Casting – Solid State diffusion technique, Cladding – Hot isostatic pressing. Properties and applications. Manufacturing of Ceramic Matrix Composites: Liquid Metal Infiltration – Liquid phase sintering. Manufacturing of Carbon – Carbon composites: Knitting, Braiding, Weaving. Properties and applications.
Unit 4: Manufacturing of Polymer Matrix Composites: Preparation of Moulding compounds and prepregs – hand layup method – Autoclave method – Filament winding method – Compression moulding – Reaction injection moulding. Properties and applications..
Unit 5: Strength: Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first play failure-insight strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using caplet plots; stress concentrations.
Reference Books
1. Material Science and Technology – Vol 13 – Composites by R.W.Cahn – VCH, West Germany.

2. Materials Science and Engineering, An introduction. WD Callister, Jr., Adapted by R. Balasubramaniam, John Wiley & Sons, NY, Indian edition, 2007.
3. Hand Book of Composite Materials-ed-Lubin.
4. Composite Materials – K.K.Chawla.
5. Composite Materials Science and Applications – Deborah D.L. Chung.
6. Composite Materials Design and Applications – Danial Gay, Suong V. Hoa, and Stephen W. Tasi.

Course Title : **Open Elective -** Waste to Energy	
Course Code : 202CSL716	**Semester : III**
Teaching Scheme : L-T-P : 0-**2-0**	Credits : 2
Evaluation Scheme : ISE Marks : 100	

Pre-Requisites	-

Course Contents
Unit 1:
Introduction to Energy from Waste: Classification of waste as fuel – Agro based, Forest residue, Industrial waste - MSW – Conversion devices – Incinerators, gasifiers, digestors
Unit 2:
Biomass Pyrolysis: Pyrolysis – Types, slow fast – Manufacture of charcoal – Methods - Yields and application – Manufacture of pyrolytic oils and gases, yields and applications.
Unit 3:
Biomass Gasification: Gasifiers – Fixed bed system – Downdraft and updraft gasifiers – Fluidized bed gasifiers – Design, construction and operation – Gasifier burner arrangement for thermal heating – Gasifier engine arrangement and electrical power – Equilibrium and kinetic consideration in gasifier operation.
Unit 4:
Biomass Combustion: Biomass stoves – Improved chullahs, types, some exotic designs, Fixed bed combustors, Types, inclined grate combustors, Fluidized bed combustors, Design, construction and operation - Operation of all the above biomass combustors.
Unit 5:
Biogas: Properties of biogas (Calorific value and composition) - Biogas plant technology and status - Bio energy system - Design and constructional features - Biomass resources and their classification - Biomass conversion processes - Thermo chemical conversion - Direct combustion - biomass gasification - pyrolysis and liquefaction - biochemical conversion - anaerobic digestion - Types of biogas Plants – Applications - Alcohol production from biomass - Bio diesel production - Urban waste to energy conversion - Biomass energy programme in India.
Reference Books
1. Non Conventional Energy, Desai, Ashok V., Wiley Eastern Ltd., 1990.
2. Biogas Technology - A Practical Hand Book - Khandelwal, K. C. and Mahdi, S. S., Vol. I & II, Tata McGraw Hill Publishing Co. Ltd., 1983.
3. Food, Feed and Fuel from Biomass, Challal, D. S., IBH Publishing Co. Pvt. Ltd., 1991.
4. Biomass Conversion and Technology, C. Y. WereKo-Brobby and E. B. Hagan, John Wiley & Sons, 1996.

Course Title : **Dissertation Phase - I**	
Course Code : 202CSP721	**Semester : III**
Teaching Scheme : L-T-P : 0-**0-24**	Credits : 12
Evaluation Scheme : ISE Marks : 50	ESE- OE Marks : 50

- The students should identify a research topic for dissertation work based from the area of the interest and complete at least 50% of the proposed work as mentioned in the approved synopsis.

- The Dissertation synopsis will be reviewed by Department Research committee (DRC). The reviewed synopsis with inclusion of given suggestions by DRC, will further be forwarded to the Expert Committee for approval.

- In case, the synopsis and title is not approved, the candidate has to prepare a new synopsis with new title as the case may be and submit to the department. Such synopsis shall be reviewed by DRC and will be placed in front of the expert committee meeting in the beginning of next semester.

- Progress report/s should be submitted based on the work done after evaluation in the mid of semester and at the end of the semester.

- ISE marks will be given based on the continuous assessment.

- There shall be ESE-OE for 50 marks and the examination will be conducted by a panel of teachers appointed by HoD.

- **Note:** The Academic Rules and regulations concerned with PG Dissertation (6.16) available on the institute website will be strictly followed.

SEMESTER-IV

Course Title : **Dissertation Phase - II**	
Course Code : 202CSP723	**Semester : IV**
Teaching Scheme : L-T-P : 0-**0-32**	Credits : 16
Evaluation Scheme : ISE Marks : 100	ESE- OE Marks : 100

- The students should complete the dissertation work as mentioned in the approved synopsis.
- Mid Semester progress presentation will be conducted based on the work done after dissertation phase-I.
- Two technical papers are to be prepared and published in Journals of good standard / IEEE Conferences in consultation with the concerned guide.
- ISE will be given based on the continuous assessment.
- There shall be ESE-OE for 100 marks and the examination will be conducted by a panel of teachers consisting of an External examiner and the Guide
- **Note:** The Academic Rules and regulations concerned with PG Dissertation (6.16) available on the institute website will be strictly followed.