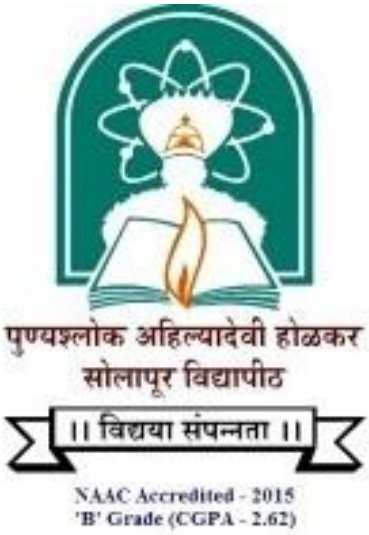

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

FACULTY OF ENGINEERING & TECHNOLOGY

ELECTRONICS ENGINEERING

CBCS Syllabus for

First and Second Year M. Tech.
w.e.f. Academic Year 2023-24

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF ENGINEERING & TECHNOLOGY

STRUCTURE OF M. Tech. (ELECTRONICS ENGINEERING)
Four Semester Course

Choice Based Credit System Syllabus w.e.f. 2023 -24

Semester-I

Sr. No.	*Subject*	*Teaching Scheme*				*Credits*				*Evaluation Scheme*				
		L	*T*	*P*	*Total*	*Credits (L)*	*Credits (T)*	*Credits (P)*	*Total Credits*	*Scheme*	*Theory Marks*	*ICA- P Marks*	*ICA-T Marks*	*Total Marks*
1	Digital Design and Verification	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
2	Advanced Digital Signal Processing	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
3	Voice and Data Networks	3	1	-	4	3.0	1.0	-	4.0	ISE	30	--	25	125
										ESE	70	--	--	
4	Machine Learning©	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
5	Elective I	3	1	-	4	3.0	1.0	-	4.0	ISE	30	--	25	125
										ESE	70	--	--	
6	Seminar- I	-	-	2	2	-	-	2.0	2.0	ISE	--	50	--	50
										ESE	--	--	--	
Total		**15**	**2**	**8**	**25**	**15.0**	**2.0**	**5.0**	**22.0**		**500**	**125**	**50**	**675**

Note : *L- Lectures, P-Practical, T-Tutorial, ISE- InSemester Evaluation, ESE- End Semester Evaluation, ICA- Internal Continuous Assessment*

© - This Course is common for M.Tech. (Electronics Engineering) and M.Tech. (Computer Science & Engineering)

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF ENGINEERING & TECHNOLOGY

STRUCTURE OF M. Tech. (ELECTRONICS ENGINEERING)
Four Semester Course
Choice Based Credit System Syllabus w. e. f. 2023-24
Semester-II

Sr. No.	*Subject*	*Teaching Scheme*				*Credits*				*Evaluation Scheme*				
		L	*T*	*P*	*Total*	*Credits (L)*	*Credits (T)*	*Credits (P)*	*Total Credits*	*Scheme*	*Theory Marks*	*ICA- P Marks*	*ICA-T Marks*	*Total Marks*
1	Research Methodology & IPR©	3	1	-	4	3.0	1.0	-	4.0	ISE	30	--	25	125
										ESE	70	--	--	
2	Communication Buses & Interfaces	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
3	Advanced IOT	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
4	PLC, SCADA and Distributed Control Systems	3	-	2	5	3.0	-	1.0	4.0	ISE	30	25	--	125
										ESE	70	--	--	
5	Elective – II	3	1	-	4	3.0	1.0	-	4.0	ISE	30	--	25	125
										ESE	70	--	--	
6	Seminar- II	-	-	2	2	-	-	2.0	2.0	ISE	--	50	--	50
										ESE	--	--	--	
Total		**15**	**2**	**8**	**25**	**15.0**	**2.0**	**5.0**	**22.0**		**500**	**125**	**50**	**675**

Note : *L- Lectures, P-Practical, T-Tutorial, ISE- InSemester Evaluation, ESE- End Semester Evaluation, ICA- Internal Continuous Assessment*
© - This Course is common for M.Tech. (Electronics Engineering) and. M.Tech. (Computer Science & Engineering)

- Seminar I shall be delivered on a topic related to student's broad area of interest for dissertation work selected in consultation with the advisor after compiling the information from the latest literature. Student shall deliver seminar using modern presentation tools. A hard copy of the report (as per format specified by the department) shall be submitted to the Department before delivering the seminar. A PDF copy of the report must be submitted to the advisor along with other details if any.

- Seminar II shall be delivered on a topic related to student's particular area of interest for dissertation work selected in consultation with the advisor after compiling the information from the latest literature. Student shall deliver seminar using modern presentation tools. A hard copy of the report (as per format specified by the department) shall be submitted to the Department before delivering the seminar. A PDF copy of the report must be submitted to the advisor along with other details if any.

- **List of elective courses for semester I and II -**

Sr.	***Elective - I***	***Elective – II***
1	Wireless Sensor Networks	Mobile Technology
2	Analog & Digital CMOS VLSI Design	Real Time Systems
3	Image and Video Processing	VLSI in Signal Processing

- Courses may be added in the list of Elective I and II as and when required

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

FACULTY OF ENGINEERING & TECHNOLOGY

STRUCT RE OF M.TECH. (ELECTRONICS ENGINEERING)

Four Semester Course

Choice-Based Credit System Syllabus

Semester-III

Sr. No.	*Subject*	*Teaching Scheme*		*Credits*			*Evaluation Scheme*			
		L	*P*	*Credits (L)*	*Credits (P)*	*Total Credits*	*Scheme*	*Theory Marks*	*ICA Marks*	*Total Marks*
1	Self Learning Course	$	-	3.0	-	3.0	ISE	30	--	100
							ESE	70		
2	Open Elective Course#	3		3.0		3.0	ISE	30		100
							ESE	70		
3	Dissertation Phase I : Synopsis Submission Seminar*		@4		3.0	3.0	ISE	--	100	100
							ESE	--	--	
4	Dissertation Phase II : ICA*		-		3.0	3.0	ISE	--	100	100
							ESE	--	--	
5	Dissertation Phase II Progress Seminar*		-		3.0	3.0	ISE	--		100
							ESE	--	100	
Total		**3**	**4**	**6.0**	**9.0**	**15.0**		**200**	**300**	**500**

L- Lectures, P-Practical, T-Tutorial, ISE- In Semester Evaluation, ESE- End Semester Evaluation, ICA- Internal Continuous Assessment

Note -

- $- Being a Self Learning Course, student shall prepare for examination as per specified syllabus
- *- For all activities related to dissertation Phase I (synopsis submission seminar and progress seminar) student must interact regularly every week with the advisor.
- # - This course is common for all branches of Technology (ie for all M.Tech. Programs)

- Synopsis submission seminar shall cover detailed synopsis of the proposed work. Student shall submit synopsis of the dissertation work only after delivering this seminar.
- Progress seminar shall be delivered capturing details of the work done by student for dissertation
- Student shall deliver all seminars using modern presentation tools. A hard copy of the report shall be submitted to the department before delivering the seminar. A PDF copy of the report must be submitted to the advisor along with other details if any
- @ Indicates contact hours of students for interaction with advisor.
- Details of modes of assessment of seminar and dissertation shall be as specified in 7(III) of PG Engineering Ordinance of Solapur University, Solapur

List Self Learning Courses -

Sr.	***Self-Learning Subject***
1	Network and Internet Security
2	Programmable System on Chip (PSoC)
3	Advanced Process Control

List of Open Elective Courses-

Sr.	***Self-Learning Subject***
1	Business Analytics
2	Operation Research
3	Cost Management of Engineering Projects
4	Product Design and Development

- New Self Learning Courses and New Open Elective Courses may be added as and when required

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

FACULTY OF ENGINEERING & TECHNOLOGY
STRUCTURE OF M.E. (ELECTRONICS ENGINEERING)
Four Semester Course
Choice Based Credit System Syllabus
Semester-IV

Sr. No.	*Subject*	*Teaching Scheme*			*Credits*			*Evaluation Scheme*		
		L	*P*	*Total*	*Credits (L)*	*Credits (P)*	*Total Credits*	*Scheme*	*ICA Marks*	*Total Marks*
1	Dissertation Phase III : Progress Seminar #	-	4@	4	-	3.0	3.0	ISE	100	100
2	Dissertation Phase IV: #	-	2@	2	-	6.0	6.0	--	200	200
3	Final Submission of the Dissertation and Viva –Voce	-	-	-	-	6.0	6.0	ESE	200	200
	Total	**-**	**-**	**6**	**--**	**15.0**	**15.0**	**-**	**500**	**500**

Note –

- #- For all activities related to dissertation Phase III & IV student must interact regularly every week with the advisor.
- Progress seminar shall be delivered capturing details of the work done by student for dissertation
- Student shall deliver all seminars using modern presentation tools. A hard copy of the report shall be submitted to the Department before delivering the seminar. A PDF copy of the report must be submitted to the advisor along with other details if any.
- Student must submit a hard copy of Project Report to the department
- @ indicates contact hours of the student for interaction with the advisor
- Details of modes of assessment of seminar and dissertation shall be as specified in 7 (III) of PG Engineering Ordinance of Solapur University, Solapur.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III

Self Learning Course

NETWORK AND INTERNET SECURITY

Examination Scheme
Theory Credits – 3.0

SECTION-I

Unit 1: Introduction:
Overview of ISO's OSI model and TCP/IP model, key management, public-key infrastructure (PKI), remote user authentication using symmetric key encryption, Kerberos, remote user authentication using asymmetric key encryption, federated identity management, biometrics

Unit 2: Wireless network security:
IEEE 802.11 wireless LAN overview: IEEE 802.11 network components, architectural model, IEEE 802.11 services; IEEE 802.11i wireless LAN security: IEEE 802.11i services, IEEE 802.11i phases of operation, discovery phase, authentication phase, key management phase & protected data transfer phase, IEEE 802.11i pseudorandom function

Unit 3: WAP security:
Wireless application protocol (WAP): WAP architecture, wireless application environment, WAP protocol architecture; wireless transport layer security (WTLS): WTLS sessions and connections, WTLS protocol architecture, cryptographic algorithms**,** WAP end-to-end security

SECTION II

Unit 4: Electronic mail security:
Pretty good privacy (PGP): notation, operational description, cryptographic keys and key rings, public-key management, S/MIME: RFC 5322, multipurpose internet mail extensions, S/MIME functionality, S/MIME messages, S/MIME certificate processing, enhanced security services, domain keys identified mail**:** internet mail architecture, e-mail threats, DKIM strategy, DKIM functional flow

Unit 5: Web and IP security:
Web security: web security requirements, secure sockets layer (SSL), transport layer security (TLS), and secure electronic transaction (SET), HTTPS, secure shell (SSH), IP security: IP security overview, architecture, authentication, encapsulating security payload, combining security associations, key management

Unit 6: System security:
Intruders, intrusion detection; password management, malicious software, viruses and related threats, virus countermeasures, distributed denial of service attacks, firewalls: firewall design, principles, trusted systems

- **Text Books:**
  1. Cryptography and Network Security: Principles and Practice, 5th Edition, William Stallings, Pearson Education, ISBN: 978-81-317-6166-3
  2. Cryptography and Network Security, Behrouz A. Forouzan, Tata McGraw-Hill. 2007, ISBN: 978-00-706-6046-5

- **Reference Books:**
  1. Network Security And Cryptography, Bernard Menezes, Cengage Learning, 2010, ISBN : 978-81-315-1349
  2. Applied Cryptography, 2nd Edition, Schneier B, Wiley & Sons. 2002, ISBN: 0-471-11709-9

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-IIISelf Learning Course

PROGRMMABLE SYSTEM ON CHIP (PSoC)

Examination Scheme
Theory Credits – 3.0

SECTION-I

Unit 1: Introduction to PSoC:
PSoC technology, programmable routing and interconnect, configurable analog and digital blocks, cpu sub system, families of PSoC (PSoC 1, PSoC 3, PSoC 5), difference between PSoC and conventional MCU.

Unit 2: Introduction to PSoC 3/5:
PSoC 3/5, architecture – block diagram, system wide resources, I/O interfaces, CPU sub system, memory organization, digital sub systems, analog sub systems

Unit 3: PSoC design modules:
Why cypress PSoC, structure of PSoC, PSoC designer suit, limitations of PSoC, improvements of the PSoC, PSoC sub system design, PSoC memory management.

SECTION-II

Unit 4: Mixed-signal embedded design:
Overview of mixed-signal embedded system designs, hardware and software subsystems of mixed-signal architecture, PSoC hardware components, PSoC software components, PSoC interrupt sub system, introduction to PSoC express, system design using PSoC express.

Unit 5: PSoC components:
Universal digital blocks (UDB), UDB arrays and digital system interconnect (DSI), timer, counter and PWM, digital filter blocks (DFB), $\Delta\sum$ ADC topologies and circuits, programmable gain amplifiers, switched capacitor / continuous time, analog routing, flash temperature sensors, DTMF dialers, sleep timers, UART, I2 C, SPI, USB, CAN buses.

Unit 6: System design using PSoC:
Interfacing of temperature sensors and tachometers, SPI and UART based task communications, lower noise continuous time signal processing with PSoC, data acquisition and control system with PSoC, ultra wide-based RADAR, serial bit receiver with hardware Manchester decoder, DTMF detector, ultrasonic vehicle parking assistant, universal wide-range signal generator.

- **Text Books:**

1. PSoC 3, PSoC 5 Architecture technical reference manual, Cypress website
2. My First Five PSoC 3 design (e-book), Robert Asbhby, Cypress website

- **Reference Books:**

1. Designer Guide to the Cypress PSoC, Robort Ashby, Elsevier Publications
2. Introduction to Mixed Signal Embedded Design, Alex Doboli, Springer
3. The Beginners Guide to Using PSoC Express: Mixed-Signal Microcontroller Development without Code, Oliver H. Bailey, Timelines Industries Incorporated, 2007
4. PSoC Mikrocontroller by Fredi Kruger Franzis, 2006

- **Web References:**

1. www.cypress.com/go/psoc
2. www.cypress.com/go/trainning
3. www.cypress.com/go/support
4. www.psocdeveloper.com

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III Self Learning Course

ADVANCED PROCESS CONTROL

Examination Scheme
Theory Credits – 3.0

SECTION-I

Unit 1: Process dynamics and mathematical modeling:
Modeling procedure, linearization, numerical solutions of ordinary differential equations, input-output models and transfer functions, dynamic behavior of typical process systems, serial & parallel structures of simple systems, multiple input-multiple output systems

Unit 2: Empirical model identification:
An empirical model building procedure, process reaction curve methods, statistical model identification.

Unit 3: Conventional feedback control system:
Desired features of a PID controller, PID controller tuning for dynamic performance, stability analysis of control systems, controller tuning based on stability: Ziegler – Nichols closed loop method, digital implementation of process control, effects of digital control on stability, tuning and performance, performance of feedback control systems

Unit 4: Cascade & feed forward control:
Cascade control: design criterion, cascade performance, controller algorithm & tuning, implementation issues; feed forward control: design criterion, feed forward performance, controller algorithm and tuning, implementation issues; analyzing a nonlinear process with linear feedback control, different issues in improving nonlinear process performance

SECTION-II

Unit 5: Model based control:
The structure of model based control, modeling approaches, internal model control (IMC),the Smith predictor, model predictive control (MPC), process model based control (PMBC), implementation guidelines.

Unit 6: Nonlinear adaptive control:
Adaptation of feedback parameters, programmed adaptation, switching controller gains and self-tuning controllers: model based methods, model reference adaptive control, pattern recognition controllers.

Unit 7: Multivariable control:
Multi-loop control, effects of interaction, performance analysis, multivariable predictive control and dynamic matrix control (DMC) approach for signal variable and multivariable, implementation issues in DMC.

Unit 8: Statistical process control:

Shewhart chart, interpretation of chart, distinction between automatic process control (APC) & statistical process control (SPC), implementing SPC concepts.

- **Reference Books:**
  1. Process Control: Designing Processes & Control Systems for Dynamic Performance, Thomas E.Marlin, McGRAW Hill International Edition.
  2. Process Control: Instrument Engineers Handbook, Editor, Bela G. Liptak, Butterworth - Heinemann Publishers.
  3. Process Dynamics: Modeling, Analysis & Simulation, B. Wayne Bequette, Prentice Hall International Edition.
  4. Process Modeling, Simulation and Control for Chemical Engineers, William Luben, McGraw Hill International Edition.
  5. Process control systems: Application, Design and Turning, F.G. Sinskey, McGraw Hill Publication Applied Process Control by

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III

Open Elective Course

BUSINESS ANALYTICS

Teaching Scheme
Lectures –3 Hours/week, 3 Credits

Examination Scheme
ESE- 70 Marks
ISE- 30 Marks

SECTION-I

Unit 1: Introduction **(4 Hrs)**

What Is Business Analytics? Business Analytics Process, Relation of BA process and Organization decision making process

What is Data Mining? Data Mining and Related Terms, Big Data, Data Science, Terminology and Notation in Data mining

Unit 2: Overview of the Data Mining Process **(5 Hrs)**

Core Ideas in Data Mining, Classification, Prediction, Association Rules and Recommendation Systems, Predictive Analytics, Data Reduction and Dimension Reduction, Data Exploration and Visualization, Supervised and Unsupervised Learning, Steps in Data Mining, Organization of Data sets

Unit 3: Data Visualization **(5 Hrs)**

Uses of Data Visualization, Basic Charts: Bar Charts, Line Graphs, and Scatter Plots, Distribution Plots: Box plots and Histograms, Heat maps: Visualizing Correlations and Missing Values

Multidimensional Visualization: Adding Variables: Color, Size, Shape, Multiple Panels, and Animation

Manipulations: Rescaling, Aggregation and Hierarchies, Zooming, Filtering, Reference: Trend Lines and Labels, Scaling up to Large Datasets

Unit 4: Dimension Reduction **(4 Hrs)**

Introduction, Curse of Dimensionality, Data Summaries, Summary Statistics, Aggregation and Pivot Tables, Correlation Analysis, Reducing the Number of Categories in Categorical Variables, Converting a Categorical Variable to a Numerical Variable, Principal Components Analysis

SECTION-II

Unit 5: Performance Evaluation **(5 Hrs)**

Evaluating Predictive Performance, Naive Benchmark: The Average, Prediction Accuracy Measures Comparing Training and Validation Performance, Lift Chart, Judging Classifier Performance, Benchmark: The Naive Rule, Class Separation, The Confusion (Classification) Matrix, Using the Validation Data, Accuracy Measures

Unit 6: Multiple Linear Regression **(4 Hrs)**

Explanatory vs. Predictive Modeling, Estimating the Regression Equation and Prediction, Variable Selection in Linear Regression, Reducing the Number of Predictors

Unit 7: Classification & Regression Trees **(5 Hrs)**

Introduction, Classification Trees, Recursive Partitioning, Measures of Impurity, Tree Structure, Classifying a New Record, Evaluating the Performance of a Classification Tree, Navie Bayes Classifier

Regression Trees : Prediction, Measuring Impurity, Evaluating Performance

Advantages and Weaknesses of a Tree

Unit 8: Clustering **(4 Hrs)**

Introduction, Feature selection for clustering: Filter models and Wrapper models, k-Means algorithm

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- **In Semester Evaluation (ISE)**

  ISE shall be based upon minimum 6 assignments based on curriculum and consisting of literature survey, case study, data compilation and analysis etc.

- **Text and Reference Books**

1. Data Mining for Business Analytics - Concepts, Techniques, And Applications In R, Galit Shmueli Peter C. Bruce Inbal Yahav Nitin R. Patel Kenneth C. Lichtendahl, Jr., Wiley Publication *https://edu.kpfu.ru/pluginfile.php/274079/mod_resource/content/2/DatMiningBusAnalytics.pdf*
2. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data by EMC Education Services (2015)
3. Business Analytics – Principles, Concepts and Applications, Marc J. Schniederjans, Dara G. Schniederjans, Christopher M. Starkey, Pearson Education Limited
4. Data Mining : The Textbook, Charu C. Agrawal, Springer Publications

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III

Open Elective Course

OPERATION RESERACH

Teaching Scheme
Lectures –3 Hours/week, 3 Credits

Examination Scheme
ESE- 70 Marks
ISE- 30 Marks

SECTION-I

Unit 1: **(5 Hrs)**
OR Models, model formulation, Linear Programming models, Graphical solution, Simplex techniques, Two Phase method

Unit 2: Duality theory - Properties of Primal and Dual Optimal Solutions, Duality Simplex method , Shadow Price- Sensitivity analysis **(5 Hrs)**

Unit 3: Simulation Techniques - Need of Simulation techniques , Monto-Carlo Simulation, random number concept, applications of Simulation technique **(5 Hrs.)**

Unit 4: Queuing Models - Introduction, Structure of queuing system, Terminology (Kendal's Notations) and Applications. Queuing Model M/M/1: /FIFO, **(3 Hrs.)**

SECTION II

Unit 5 : Inventory control - Inventory costs, Economic order quantity, deterministic models with or without shortages - probabilistic models - Price break model, Selective Inventory management techniques. **(5 Hrs.)**

Unit 6: Replacement analysis - Replacement models - Replacement policy for items considering change in money value with time - Individual replacement policy - Group replacement policy **(5 Hrs.)**

Unit 7: Network flow models - Minimal Spanning Tree problems -Shortest route probems - Dijiktra's algorithm - Maximal Flow problem **(3 Hrs.)**

Unit 8 : PERT and CPM Networks - floats and applications - Network crashing - Cost optimization - Resource allocation and scheduling **(5 Hrs.)**

- **In Semester Evaluation (ISE)**
  ISE shall be based upon minimum 5 assignments and at least one case study.

- **Reference Books**

  1. Operations Research by Hillier and Lieberman TMGH
  2. HamdyTaha, “Operations Research – An Introduction”, 7th edition PHI (2003)
  3. S. D. Sharma, “Operation Research”, Kedarnath and Rannalt Pub.
  4. Hira and Gupta, “Operation Research”, S. Chand and Co.
  5. N. D. Vohra, “Quantitative Techniques in Management”, TMGH
  6. Shrinath L.S.: PERT & CPM –Affiliate East West Press
  7. Anand Sharma " Quantitative Techniques for decision making" Himalaya publishing house
  8. Billy E. Gillet - " Introduction to Operations Research" TMGH
  9. R.Panneerselvan " Operations Research" PHI

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-

IIIOpen Elective Course

COST MANAGEMENT OF ENGINEERING PROJECTS

Teaching Scheme
Lectures –3 Hours/week, 3 Credits

Examination Scheme
ESE- 70 Marks
ISE- 30 Marks

SECTION I

Unit 1: Cost and Cost Analysis **(8 hours)**

Cost:- Cost Elements - Pricing , Materials ,Labor , Engineering , Equipment, Parts and Tools; Economic Costs ;

Cost Analysis:- Diect Cost, indirect Cost, Overhead, allowance, Contingency

Unit 2: **Cost Estimating:** **(7 hours)**

Estimating Models; Parametric estimating- moduler estimating, parametric model , Analogous estimating- ratio estimating, The Three-quarters rule, The Square root rule, Two-Thirds rule, Range estimating

Unit 3: Progress & Cost Control: **(7 hours)**

Progress Measurement and Earned Values; Earned Value for Variable Budgets; Tracking Cost and Schedule Performance;

SECTION II

Unit 4: Cost Management: **(8 hours)**

Causes of Change, Feed Forward Techniques, Impact of schedule on cost, Lifecycle costs, Impact of project risk, integrated cost management programme.

Unit 5: Value Management: **(7 hours)**

Concept of Value ,Dimensions and Measures of Value , Overview of Value Management, Definition' Scope, Key Principles of VM , Key Attributes of VM ,Value Management Terms , Need for Value Management in Projects , The Value Management Approach ,Cross-functional Framework ' Use of Functions, Structured Decision Process, The VM Process, Benefits of Value Management, Other VM requirements

Relationship between Project Value and Risk, Value Management as an Aid to Risk Assessment

Unit 6: Value Analysis: **(7 hours)**

Earned Value Management for assessing project performance, Earned Value Management, Earned Value Management Model, Fundamentals of Earned Value, EVM Terminology, Relevancy of Earned Value Management, Conducting an Earned Value Analysis, Performing an Earned Value Assessment, Managing a Portfolio of Projects with Earned Value Management, Important Issues in the Effective Use of Earned Value Management

Integrating Cost and Value in Projects.

- **In Semester Evaluation (ISE)**

  ISE shall be based upon minimum 6 assignments based on curriculum and consisting of literature survey, case study, data compilation and analysis etc

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- **Text and Reference Book:-**

1. Project Estimating and Cost Management By Parivs F. Rad PhD, PMP
2. Project Cost Management guide from PMBOK 5th edition
3. Project Scheduling and Cost Control: Planning, Monitoring and Controlling the Baseline by James Taylor
4. Systems Life Cycle Costing: Economic Analysis, Estimation, and Management, John V. Farr, Draft Textbook, Version 1.0.
5. COST AND VALUE MANAGEMENT IN PROJECTS Ray R. Venkataraman and Jeffrey K. Pinto John Wiley & Sons, Inc Inc., Hoboken, New Jersey
6. American Association of Cost Engineers, "SKILLS AND KNOWLEDGE OF COST ENGINEERING", 1996
7. Cost Management of Capital Projects (Cost Engineering) by Kurt Heinze – International Edition, August 28, 1996

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-

IIIOpen Elective Course

PRODUCT DESIGN AND DEVELOPEMNT

Teaching Scheme
Lectures –3 Hours/week, 3 Credits

Examination Scheme
ESE- 70 Marks
ISE- 30 Marks

SECTION I

Unit 1: Introduction to product design and development **(6 hours)**

Product life cycle, Product policy of an organization and profitable product selection, Product design, Product design steps and analysis

Unit 2 **Value Engineering and analysis:** **(6 hours)**

Value Engineering concepts, Problem Identification, Functional analysis Functional analysis system steps, Case study on Value Engineering and analysis

Unit 3: Quality Function Deployment : **(7 hours)**

Computer Aided Design, Robust Design, Design for X Ergonomics in product design

SECTION II

Unit 4: Ergonomics in product design: **(8 hours)**

Ergonomics/ Human factors, Posture and movement, Ergonomic design process, Performance support and design intervention, Design Ergonomics in India: scope for exploration

Unit 5: DFMA (Design for Manufacturing and Assembly): **(7 hours)**

DFMA guidelines, Product Design for manual assembly, Design guidelines for different processes, Rapid prototyping – concepts and advantages, Prototyping processes.

Unit 6: Economic Decision: **(7 hours)**

Making/Cost Evaluation, Life cycle analysis Planning and Scheduling, Planning for manufacturing, Project planning, Risk and Opportunity Management, Metrics for Design and Development Program, Leadership Management and Control, Project start-up, Plans/schedules Design for Cost: Design for Six Sigma: Process, Invent, Innovate, Develop, Optimize and Verify.

- **In Semester Evaluation (ISE)**
  ISE shall be based upon minimum 6 assignments based on curriculum.

- **Text and Reference Book :-**

1. Ulrich, Karl, and Steven Eppinger. Product Design and Development. McGraw-Hill,

2. Kemnneth Crow: Concurrent Engg./Integrated Product Development, DRM

3. Staurt Pugh: Tool Design -Integrated Methods for Successful Product Engineering, Addison Wesley Publishing, New York, NY

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M. Tech. (Electronics) Semester-III

Dissertation Phase I: Synopsis Submission Seminar

Examination Assessment Scheme

Credits: 3 **ICA – 100 Marks**

- The student is expected to carry out intensive literature survey for a period of about two months in the field of interest and to select a topic for his/her dissertation in consultation with the faculty advisor assigned.
- The student shall then submit a report and deliver a seminar on the problem chosen by him/her to the panel of three departmental PG recognized faculty members.
- It is expected that a student justifies the gravity and also the relevance of the problem through his/her seminar. This shall be for the approval of synopsis.
- The assessment of Synopsis Submission Seminar shall be done by aforesaid panel of three departmental PG recognized faculty members.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III

Dissertation Phase II : ICA

Examination Assessment Scheme

Credits: 3 **ICA – 100 Marks**

- Student shall submit a report to the faculty advisor, on the basis of work carried out in accordance with instructions given by faculty advisor, throughout the semester. Dissertation Phase II evaluation consists of term-work evaluation (ISE) based on the efforts put in by the student to carry out his/her work & the results obtained.
- The faculty advisor shall complete the assessment of the report and accordingly allocate the marks to the student out of maximum 100 marks.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M.Tech. (Electronics) Semester-III

Dissertation Phase II : Progress Seminar

Examination Assessment Scheme

Credits: 3 **ICA – 100 Marks**

- Progress seminar shall be delivered capturing details of the work done by the student for dissertation. Student shall deliver seminar using modern presentation tools.
- A hard copy of report shall be submitted to the faculty advisor before delivering the seminar. A PDF copy of the report must be submitted to the faculty advisor along with other details if any.
- End Semester Evaluation (ESE) shall consist of presentation of progress seminar on the report submitted by the student, followed by demonstration before a panel of three departmental PG recognized faculty members.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M. Tech. (Electronics) Semester-IV

Dissertation Phase III – Progress Seminar

Examination Assessment Scheme

Credits: 3 **ICA – 200 Marks**

- For all activities related to Phase III, student must interact regularly every week with the faculty advisor. The student who has cleared his/her Phase II evaluation, shall submit a report and present the status of work carried out on the dissertation after 8-10 weeks of Phase II ESE to three departmental PG recognized faculty members.
- Progress seminar shall be delivered capturing details of the work done by student for dissertation. Student shall deliver seminar using modern presentation tools.
- A hard copy of report shall be submitted to the faculty advisor before delivering the seminar. A PDF copy of the report must be submitted to the faculty advisor along with other details if any. The evaluation will be done by the aforesaid panel of three departmental PG recognized faculty members based on the requirements of completion of dissertation work for the dissertation Phase III.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M. Tech. (Electronics) Semester-IV

Dissertation Phase IV

Examination Assessment Scheme

Credits: 3 **ICA – 200 Marks**

- After completing the dissertation work to the satisfaction of faculty advisor, the student shall submit the dissertation report to the University in the prescribed format.
- The final approved dissertation shall be submitted in black bound hard copy. The evaluation of dissertation is to be carried out by the faculty advisor as ICA. This evaluation shall be on the basis of the requirements of completion of dissertation work.
- The faculty advisor shall submit mark list of term work marks, along with the submission of dissertation to university as mentioned in assessment scheme.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

M. Tech. (Electronics) Semester-IV

Final Submission of the Dissertation and Viva –Voce

Examination Assessment Scheme

Credits: 3 **ICA – 200 Marks**

- Open defense of the student on his/her dissertation shall be arranged by the university.
- This defense shall be in front of the panel of examiners as appointed by university authority. The evaluation will be done by panel of examiners as appointed by university authority.