

M.Tech.-IT 3rd Semester

Category	Course Code	Course Title	Subject Type	Hours per week			Marks Distribution			Credits
				L	T	P	Int	Ext	Total	
Professional Elective	25C1ITP-PE5-XX	Elective-V 01-Secure Software Design and Enterprise Computing 02-Parallel Programming Tools and Model 03-Optimization Techniques	T	3	0	0	40	60	100	3
Open Elective	25C1ITP-0E-XX	Open Elective 1- Business Analytics 2- Industrial Safety 3- Operations Research 4- Cost Management of Engineering Projects 5- Composite Materials 6- Waste to Energy	T	3	0	0	40	60	100	3
Dissertation	25C1ITP-314	Dissertation-I	P	0	0	14	60	40	100	7
Training	25C1ITP-315	Industry/ Institutional Training	P	0	0	6	60	40	100	3
TOTAL				6	0	14	200	200	400	16

M.Tech.-IT 4th Semester

Category	Course Code	Course Title	Subject Type	Hours per week			Marks Distribution			Credits
				L	T	P	Int	Ext	Total	
Thesis	25C1ITP-411	Dissertation - II	P	0	0	32	60	40	100	16
TOTAL				0	0	32	60	40	100	16

M. Tech. IT
3rd Semester
Syllabus

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-PE5-01	Secure Software Design and Enterprise Computing	PEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Differentiate various software vulnerabilities based on their characteristics and impacts.
CO2	Analyze software process vulnerabilities within organizational systems.
CO3	Predict resource consumption in enterprise software systems to ensure efficiency.
CO4	Integrate security practices within the software development life cycle.
CO5	Design secure enterprise applications and resilient network infrastructures.

Detailed Syllabus

UNIT 1: Secure Software Design: Identify software vulnerabilities and perform software security analysis, Master security programming practices, Master fundamental software security design concepts, Perform security testing and quality assurance. **(8 Hrs.)**

UNIT 2: Enterprise Application Development: Describe the nature and scope of enterprise software applications, Design distributed N- tier software application, Research technologies available for the presentation, business and data tiers of an enterprise software application, Design and build a database using an enterprise database system, Develop components at the different tiers in an enterprise system, Design and develop a multi-tier solution to a problem using technologies used in enterprise system, Present software solution. **(11 Hrs.)**

UNIT 3: Enterprise Systems Administration: Design, implement and maintain a directory-based server infrastructure in a heterogeneous systems environment, monitor server resource utilization for system reliability and availability, Install and administer network services (DNS/DHCP/Terminal Services/Clustering/Web/Email). **(8 Hrs.)**

UNIT 4: Obtain the ability to manage and troubleshoot a network running multiple services. Understand the requirements of an enterprise network and how to go about managing them. **(8 Hrs.)**

UNIT 5: Handle insecure exceptions and command/SQL injection, defend web and mobile applications against attackers, software containing minimum vulnerabilities and flaws. **(9 Hrs.)**

UNIT 6:
Case study of DNS server, DHCP configuration and SQL injection attack. **(4 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Secure Software Design	Theodor Richardson, Charles N Thies	Jones & Bartlett	2013

Reference Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	An Introduction to Optimization	Edwin K. P. Chong, Stanislaw H. Zak	Wiley- Blackwell	2008

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-PE5-02	Parallel Programming Tools and Model	PEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Classify parallel architecture parameters that are essential for the classification of modern parallel processing systems.
CO2	Discover the methodologies employed for synchronization and memory consistency and cache coherence in shared memory systems.
CO3	Compare the different types of interconnects employed in parallel processing systems.
CO4	Outline and analyse the features of micro-architecture parallel systems such as superscalar, VLIW, vector, multithreading, CMP multi-core and tile processors.
CO5	Describe how the performance of a parallel system can be measured, list possible sources for performance losses and propose ways to improve the performance of a system.

Detailed Syllabus

UNIT 1: Introduction to Parallel Computing Architectures, parallel hardware/multi-cores, Processes and threads, Programming models: shared memory and message passing, Amdahl's Law. **(8 Hrs.)**

UNIT 2: Introduction to parallel hardware: multi-cores and multiprocessors, shared memory and message passing architectures, cache hierarchy and coherence, sequential consistency. **(9 Hrs.)**

UNIT 3: Introduction to parallel software: Steps involved in developing a parallel program, Dependence analysis, Domain decomposition, Task assignment: static and dynamic, Performance issues: 4C cache misses, inherent and artifactual communication, false sharing, computation-to-communication ratio as a guiding metric for decomposition, hot spots and staggered communication. **(8 Hrs.)**

UNIT 4: Shared memory parallel programming: Synchronization Locks and barriers, Hardware primitives for efficient lock implementation, Lock algorithms, Relaxed consistency models, High-level language memory models (such Java and/or C++), Memory fences. Developing parallel programs with UNIX fork model: IPC with shared memory and message passing, UNIX semaphore and its all-or-none semantic. Developing parallel programs with POSIX thread library, Thread creation, Thread join, Mutex, Condition variables. Developing parallel programs with OpenMP directives: Parallel for, Parallel section, Static, dynamic, guided, and runtime scheduling, Critical sections and atomic operations, Barriers Reduction. **(10 Hrs.)**

UNIT 5:

Introduction to GPU programming: GPU architecture, Introduction to CUDA programming, Concept of SIMD and SIMT computation, Thread blocks, Warps, Global memory, Shared memory, Thread divergence in control transfer. **(8 Hrs.)**

UNIT 6: Recent trends in Parallel Programming Models and Paradigms. Case study of parallel hardware which include shared memory architecture and message passing architectures for efficient computing. **(5 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	An Introduction to Parallel Programming	Peter S Pacheco	Morgan Kaufmann	2011
2	The Art of Multiprocessor Programming	M Herlihy and N Shavit	Morgan Kaufmann	2008

Reference Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Computer Architecture: A Quantitative Approach	JL Hennessy and DA Patterson	Morgan Kaufmann/Els India	2006

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-PE5-03	Optimization Techniques	PEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Illustrate the applications of optimization in engineering and Formulate optimization problems
CO2	Solve various optimization problems through the application of optimal criteria
CO3	Analyze mathematical programming branches for the solution of various NP-hard problems.
CO4	Evaluate different optimization algorithms along with their applications
CO5	Identify the solution to various real-life problems with recent trends in the optimization algorithms

Detailed Syllabus

UNIT 1:

Engineering application of Optimization, Formulation of design problems as mathematical programming problems. **(7 Hrs.)**

UNIT 2: General Structure of Optimization Algorithms, Constraints, The Feasible Region. **(7 Hrs.)**

UNIT 3: Branches of Mathematical Programming: Optimization using calculus, Graphical Optimization, Linear Programming, Quadratic Programming, Integer Programming, Semi Definite Programming. **(11 Hrs.)**

UNIT 4: Optimization Algorithms like Genetic Optimization, Particle Swarm Optimization, Ant Colony Optimization etc **(12 Hrs.)**

UNIT 5: Real life Problems and their mathematical formulation as standard programming problems. **(6 Hrs.)**

UNIT 6: Recent trends: Applications of ant colony optimization, genetics and linear and quadratic programming in real world applications. **(5 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Integer programming.	Laurence A. Wolsey	Wiley	1998
2	An Introduction to Optimization.	Edwin K., P. Chong & Stanislaw	Wiley	2013

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-OE-01	Business Analytics	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain the concepts, processes, and scope of business analytics and statistical tools used for data analysis.
CO2	Apply statistical and regression techniques to analyze trends and relationships in business data.
CO3	Analyze business data using descriptive, predictive, and prescriptive analytics techniques.
CO4	Predict forecasting models, simulation methods, and decision analysis techniques for business decision-making.
CO5	Develop data-driven insights and recommendations using modern business analytics tools and techniques.

Detailed Syllabus

UNIT 1:

Business analytics: Overview of Business analytics, Scope of Business analytics, Business Analytics Process, Relationship of Business Analytics Process and organization, competitive advantages of Business Analytics. Statistical Tools: Statistical Notation, Descriptive Statistical methods, Review of probability distribution and data modelling, sampling and estimation methods overview. **(10 Hrs.)**

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. **(9 Hrs.)**

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. **(10 Hrs.)**

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. **(11 Hrs.)**

UNIT 5:

Decision Analysis: Formulating Decision Problems, Decision Strategies with the without

Outcome Probabilities, Decision Trees, The Value of Information, Utility and Decision Making. **(8 Hrs.)**

Recent Trends:

Recent Trends in: Embedded and collaborative business intelligence, Visual data recovery, Data Storytelling and Data journalism.

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Business analytics Principles, Concepts, and Applications	Marc J. Schniederjans, Dara G. Schniederjans, Christopher M. Starkey	Pearson FT Press	2014
2	Business Analytics	James Evans	Pearsons Education	2020

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-OE-02	Industrial Safety	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain the concepts of industrial safety, types of hazards, and accident prevention methods.
CO2	Identify mechanical and electrical hazards and apply appropriate fire prevention and firefighting techniques in industrial environments.
CO3	Analyze wear, corrosion, and lubrication methods for improving the reliability and safety of industrial machinery.
CO4	Apply decision tree techniques to diagnose and trace faults in industrial equipment and machine tools.
CO5	Evaluate periodic and preventive maintenance strategies to ensure safe and efficient operation of mechanical and electrical systems.

Detailed Syllabus

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, washrooms, drinking water layouts, light, cleanliness, fire, guarding, pressure vessels, etc., Safety colour codes. Fire prevention and firefighting, equipment and methods. **(8 Hrs.)**

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. **(7 Hrs.)**

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. **(8 Hrs.)**

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. **(8 Hrs.)**

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. **(8 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Maintenance Engineering Handbook	Higgins & Morrow	Da Information Services	1987
2	Pump-hydraulic Compressors	Audels	McGraw Hill Publication	6 th (2004)

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-OE-03	Operations Research	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Apply model formulation techniques and perform sensitivity analysis for decision-making models.
CO2	Solve linear programming problems using appropriate optimization techniques.
CO3	Evaluate optimal solutions for non-linear programming problems using suitable algorithms
CO4	Analyze scheduling and sequencing models for solving real-life optimization problems
CO5	Design dynamic programming models to address optimization problems involving discrete and continuous variables.

Detailed Syllabus

UNIT 1: Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models. **(8 Hrs.)**

UNIT 2: Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method- sensitivity analysis - parametric programming. **(8 Hrs.)**

UNIT 3: Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem- CPM/PERT. **(7 Hrs.)**

UNIT 4: Scheduling and sequencing - single server and multiple server models – deterministic inventory models - Probabilistic inventory control models - Geometric Programming. **(7 Hrs.)**

UNIT 5: Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flowin Networks, Elementary Graph Theory, Game Theory Simulation. **(6 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Operations Research-An Introduction	H.A. Taha	PHI	2008
2	Principles of Operations Research	H.M. Wagner	PHI	1982
3	Introduction to Optimisation: Operations Research	J.C. Pant	Jain Brothers, Delhi	2008

Reference Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Operations Research	Hitler Libermann	McGraw Hill Pub	2009
2	Operations Research	Pannerselvam	Prentice Hall of India	2010

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-OE-04	Cost Management of Engineering Projects	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain fundamental cost concepts and the role of costing systems in inventory valuation and managerial decision-making.
CO2	Apply project management tools such as bar charts and network diagrams for planning and controlling engineering project costs and schedules.
CO3	Analyze cost–volume–profit relationships and apply costing techniques such as marginal costing and break-even analysis for profit planning.
CO4	Evaluate modern cost management approaches including activity-based costing, budgeting methods, and performance measurement techniques.
CO5	Apply quantitative techniques such as PERT, CPM, linear programming, and simulation for effective cost management in engineering projects.

Detailed Syllabus

UNIT 1: Introduction and Overview of the Strategic Cost Management Process. 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. **(6 Hrs.)**

UNIT 2: 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 **(8 Hrs.)**

UNIT 3: 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 **(8 Hrs.)**

UNIT 4: 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. **(6 Hrs.)**

UNIT 5: Quantitative techniques for cost management, Linear Programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, Learning Curve Theory. **(4 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Horngren's Cost Accounting A Managerial Emphasis	Srikant Datar, Madhav Rajan	Pearson	16 th (2017)
2	Introduction to Management Accounting	Charles T. Horngren	Pearson	2012
3	Quantitative Techniques in Management	N.D. Vohra	Tata McGraw Hill Book	6 th (2021)

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-OE-05	Composite Materials	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Identify the classification, properties, and applications of composite materials and the role of reinforcement and matrix in composite performance.
CO2	Apply mechanical models such as rule of mixtures to evaluate the behavior of reinforced composites.
CO3	Analyze the properties and applications of different reinforcement materials.
CO4	Select appropriate manufacturing techniques for metal, ceramic, and polymer matrix composites.
CO5	Analyze strength and failure of composite laminates using suitable failure criteria for composite design.

Detailed Syllabus

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. **(6 Hrs.)**

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. Is strain and Is stress conditions. **(7 Hrs.)**

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. **(8 Hrs.)**

UNIT 4: Manufacturing of Polymer Matrix Composites: Preparation of Moulding compounds and pre pregs–hand layup method – Autoclave method – Filament winding method – Compression moulding –Reaction injection moulding. Properties and applications. **(4 Hrs.)**

UNIT 5:

Strength: Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first ply failure-insight strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using caplet plots; stress concentrations. **(5 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
1	Material Science and Technology	R.W.Cahn	Wiley VCH	13 th (1993)
2	Callister's Materials Science and Engineering	R. Balasubramaniam	Wiley	2 nd (2014)

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1CITP-OE-06	Waste to Energy	OEC	3	3	0	0	40	60	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain the classification of waste as fuel and the basic principles of waste-to-energy conversion systems.
CO2	Apply principles of biomass Pyrolysis and Gasification for energy generation from biomass resources.
CO3	Analyze the design and operation of biomass combustion systems for thermal and power generation applications.
CO4	Evaluate the performance and applications of Biogas and other bioenergy systems for sustainable energy production.
CO5	Assess waste-to-energy technologies for converting biomass and urban waste into useful fuels and power.

Detailed Syllabus

UNIT 1: Introduction to Energy from Waste: Classification of waste as fuel – Agro based, Forest residue, Industrial waste - MSW – Conversion devices – Incinerators, gasifiers, digestors. **(5 Hrs.)**

UNIT 2: Biomass Pyrolysis: Pyrolysis – Types, slow fast – Manufacture of charcoal – Methods - Yields and application – Manufacture of pyrolytic oils and gases, yields and applications. **(5 Hrs.)**

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. **(7 Hrs.)**

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. **(6 Hrs.)**

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. **(8 Hrs.)**

Text Books

S. No	Name of the Books	Author	Publisher	Edition (Publication Year)
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.	Tata McGraw Hill	1983
3	Biomass Conversion and Technology	C. Y. WereKo-Brobby, E. B. Hagan	John Wiley & Sons	1996

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-314	Dissertation-I	Dissertation	7	0	0	14	60	40	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain fundamental concepts and recent research trends in the selected area of computing.
CO2	Identify a relevant research problem based on research gaps and formulate clear objectives in the chosen domain of computing.
CO3	Analyze the identified problem and propose feasible technical solutions based on existing literature and tools.
CO4	Apply emerging technologies such as Blockchain, IoT, Robotics, ML, AI, Data Mining, and Big Data Analytics to solve problems.
CO5	Propose the dissertation work effectively through written reports, presentations, and documentation at various stages.

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-315	Industry/ Institutional Training	Training	3	0	0	6	60	40	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Explain fundamental concepts and recent research trends in the selected area of computing.
CO2	Identify a relevant research problem and formulate clear objectives in the chosen domain of computing.
CO3	Analyze the identified problem and propose feasible technical solutions based on existing literature and tools.
CO4	Apply emerging technologies such as Blockchain, IoT, Robotics, ML, AI, Data Mining, and Big Data Analytics to solve problems.
CO5	Propose the project work effectively through written reports, presentations, and documentation at various stages.

M. Tech. IT
4th Semester
Syllabus

Course Code	Course Title	Category	Cd	L	T	P	Marks		
							Internal Marks	External Marks	Total
25C1ITP-411	Dissertation-II	Dissertation	16	0	0	32	60	40	100

Course Outcomes

At the end of the course, the student will be able to:	
CO1	Identify a computational problem relevant to the chosen domain of computing.
CO2	Evaluate existing approaches and analyze proposed solutions to the identified problem.
CO3	Design and implement effective computational solutions and analyze their performance and results.
CO4	Demonstrate ethical practices and continuous learning while conducting research in computing domains.
CO5	Develop a comprehensive thesis through structured documentation and oral defense.