

**SCHEME FOR EXAMINATION  
B.TECH (FOUR YEAR) DEGREE COURSE  
THIRD YEAR, INFORMATION TECHNOLOGY  
SEMESTER V  
EFFECTIVE FROM SESSION 2022-23**

SL. NO.	SUBJECT CODE	SUBJECTS	PERIODS/ WEEK			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	TOTAL	
<b>THEORY</b>									
1	IT205TES07	SIGNALS & SYSTEMS	3	0	0	30	70	100	3
2	IT205TPC01	DATABASE MANAGEMENT SYSTEMS	3	0	0	30	70	100	3
3	IT205TPC02	FORMAL LANGUAGE & AUTOMATA THEORY	3	0	0	30	70	100	3
4	IT205TPC03	PYTHON PROGRAMMING	3	1	0	30	70	100	4
5	IT205TPE1X	ELECTIVE – I	3	0	0	30	70	100	3
<b>PRACTICAL</b>									
1	IT205PPC01	DATABASE MANAGEMENT SYSTEMS LAB	0	0	4	30	20	50	2
2	IT205PPC02	PYTHON PROGRAMMING LAB	0	0	4	30	20	50	2
3	IT205PMC01	CONSTITUTION OF INDIA/ ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	-	-	2	-	-	-	0
<b>TOTAL CREDITS</b>									<b>20</b>
<b>IA- INTERNAL ASSESSMENT, ESE-END SEMESTER EXAMINATION, L-LECTURE, T-TUTORIAL, P-PRACTICAL</b>									

**LIST OF ELECTIVE-I**

1	IT205TPE11	SOFTWARE ENGINEERING
2	IT205TPE12	REAL TIME SYSTEM
3.	IT205TPE13	CYBER LAW & ETHICS
4.	IT205TPE14	EMBEDDED SYSTEMS

**SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY**  
**GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) (A CENTRAL UNIVERSITY)**  
**B. TECH. INFORMATION TECHNOLOGY**

**Programme Outcomes:** Graduates will be able to:

**PO1: Fundamentals:** Apply knowledge of mathematics, science and engineering.

**PO2: Problem analysis:** Identify, formulate and solve real time engineering problems using first principles.

**PO3: Design:** Design engineering systems complying with public health, safety, cultural, societal and environmental considerations

**PO4: Investigation:** Investigate complex problems by analysis and interpreting the data to synthesize valid solution.

**PO5: Tools:** Predict and model by using creative techniques, skills and IT tools necessary for modern engineering practice.

**PO6: Society:** Apply the knowledge to assess societal, health, safety, legal and cultural issues for practicing engineering profession.

**PO7: Environment:** Understand the importance of the environment for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics, and responsibilities and norms of the engineering practice.

**PO9: Teamwork:** Function effectively as an individual and as a member or leader in diverse teams and multidisciplinary settings.

**PO10: Communication:** Communicate effectively by presentations and writing reports.

**PO11: Management:** Manage projects in multidisciplinary environments as member or a team leader.

**PO12: Life-long learning:** Engage in independent lifelong learning in the broadest context of technological change.

**Programme Specific Outcomes:**

**PSO1:** To apply knowledge of recent computing technologies, skills and current tools of Information Technology Engineering.

**PSO2:** To design software systems, components or processes to meet identified needs within economic, environmental and social constraints.

**PSO3:** To explore research gaps, analyze and carry out research in the specialized/emerging areas.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TES07	3	0	0	3 HOURS	30	70	3

## Signal & System

### Course Objectives:

The objectives of the course are to make the students:

1. Familiar with the fundamental types and properties of signals and systems.
2. To develop an understanding the concept of representation of various time and frequency domains systems.
3. To introduce different transformation methods used in time and frequency domains.
4. To Familiar with state variable analysis for MIMO system.
5. To explore the concept of continuous to discrete conversion technique needed in communication.

**UNIT – I Signals & Systems:** Classification of Signals, Energy and Power Signals, Classification of systems, Properties of systems – Linearity: additivity and homogeneity, Shift-invariance, Causality, Stability. Time domain Analysis of Discrete time and Continuous time System – Impulse Response, Step Response and Convolution, Properties of Convolution, system representation of differential and difference equation.

**UNIT – II Analysis of Continuous & Discrete time Signals:** Fourier series Representation, Continuous Time Fourier Transform (CTFT), Magnitude & Phase response, Properties of CTFT. System Analysis with Fourier Transform.

Discrete-Time Fourier Transform (DTFT), Properties of DTFT, Frequency response of discrete time LTI systems. Discrete Fourier Transform (DFT)

**UNIT – III Review of Laplace transform:** Laplace transforms, Laplace transforms of common signals, Properties of Laplace transforms, Inverse Laplace transforms, Region of Convergence, Poles and Zeros of the system, Laplace domain analysis of continuous time systems, solution to differential equations & system behavior.

**UNIT – IV Z-Transform:** Z-transforms of common sequences, Properties of Z-transforms, Region of Convergence, Inverse Z-transforms, Analysis of discrete time systems using Z-transforms.

**UNIT – V State space Analysis:** State Space analysis and multi-input multi-output representation, State Transition Matrix (STM) and its role. The Sampling theorem and its implications- Spectra of sampled signals, Reconstruction: Ideal interpolator, zero order hold, first order hold, Aliasing & its effect.

### SUGGESTED BOOKS & REFERENCE:-

1. Signal & System, A V Oppenheim, PHI
2. Signal & System, P Ramesh Babu, Scitech Publication
3. Signal & System, F Hussain, Umesh Publication
4. Discrete Time Signal Processing, A V Oppenheim, Pearson Education
5. Signals and Systems, by Simon Haykin and Barry Van Veen. Wiley, 1999.

6. Schaum's Outline of Signals and Systems – H Hsu, TMH.
7. Signal & System, Samarjit Ghosh, TMH.

**Course Outcomes :**

At the end of this course students will able to:

1. Analyze and identify different types of continuous and discrete signals and systems.
2. Analyse the spectral characteristics of continuous-time periodic and a periodic signals using Fourier analysis
3. Perform different continuous and discrete time domain transformation technique.
4. Analyze multiple input multiple output system [MIMO].
5. Obtain the conversion using sampling and reconstruction of signals.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	2	2							3		1	2
CO2	3	3	1	3	2							3		1	2
CO3	3	3	2	2	3							3		1	2
CO4	3	3	2	2	2							3		1	1
CO5	3	3	2	2	1							3		1	3

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPC01	3	0	0	3 HOURS	30	70	3

## Database Management Systems

### Course Objectives:

1. To understand the basic concepts and the applications of database systems.
2. To master the basics of SQL and construct queries using SQL.
3. Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

**Unit 1:** Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML). Data models: Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.

**Unit 2:** Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server. Relational database design: Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design. Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

**Unit 3:** Storage strategies: Indices, B-trees, hashing. Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

**Unit 4:** Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.

**Unit 5:** Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

### Suggested books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.

### Suggested reference books

1. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
2. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education.
3. "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley.

### Course Outcomes:

1. Gain knowledge of fundamentals of DBMS, database design and normal forms.
2. Understand the basic principles of database management systems.
3. Master the basics of SQL for retrieval and management of data.
4. Be acquainted with the basics of transaction processing and concurrency control.
5. Familiarity with database storage structures and access techniques.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1								3	2	1
CO2	3	3	3	1	3								3	2	1
CO3	3	3	3	1	1								3	2	1
CO4	3	2	2	2	1								3	3	1
CO5	3	3	2	3	1								3	2	1

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPC02	3	0	0	3 HOURS	30	70	3

## Formal Language & Automata Theory

### Course Objectives:

1. Understand basic properties of formal languages and formal grammars.
2. Design and Understand basic properties of deterministic and nondeterministic finite automata
3. Design and Understand basic properties of pushdown automata.
4. Understand the relation between types of languages and types of finite automata
5. Design and Understanding the Context free languages and grammars, and also Normalising CFG.
6. Understanding the minimization of deterministic and nondeterministic finite automata.
7. Design and Understand basic properties of Turing machines and computing with Turing machines.
8. Design and Understand the concept of Mealy and Moore automata and its application.
9. Know the concepts of tractability and decidability, the concepts of NP-completeness and NP-hard problem.
10. Understand the challenges for Theoretical Computer Science.

**Unit-I Automata:** Basic machine, FSM, Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata. Regular Sets and Regular Grammars: Alphabet, words, Operations, Regular sets, Finite automata and regular expression, MyhillNerode theorem Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

**Unit-II Context –Free Grammars:** Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

**Unit-III Pushdown Automata:** Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA. Context Free Languages: The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

**Unit-IV Turing Machines:** Introduction, TM model, representation and languages acceptability of TM Design of TM, Universal TM & Other modification, Church's hypothesis, composite & iterated TM. Turing machine as enumerators. Properties of recursive & recursively enumerable languages, Universal Turing machine

**Unit V Tractable and Untractable Problems:** P, NP, NP complete and NP hard problems, examples of these problems like satisfy ability problems, vertex cover problem, Hamiltonian path problem, traveling sales man problem, Partition problem etc.

### Suggested books

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.

**Suggested reference books:**

1. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia.
2. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.
3. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.
4. John Martin, Introduction to Languages and The Theory of Computation, TataMcGraw Hill.

**Course Outcomes :**

1. Comprehend Knowledge to acquire a full understanding of Automata Theory as the basis of all computer science languages - Model building and have a clear understanding of the Automata theory concepts.
2. Cognitive skills - Be able to design FAs, NFAs, Grammars, languages modeling, small compilers basics.
3. Be able to design sample automata - Be able to minimize FA's and Grammars of Context Free Languages.
4. Professional Skill - Perceive the power and limitation of a computer as a computing machine.
5. Attitude- Develop a perception on the importance of computational theory as model building.

**Course Outcomes and their mapping with Programme Outcomes:**

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3								3	2	3
CO2	3	2	3	2	3								2	3	2
CO3	2	2	3	2	3								2	3	2
CO4	3	2	3	2	3								2	3	2
CO5	3	2	2	3	3								3	3	2

Weightage: 1-Slightly, 2-Moderately, 3-Strongly



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPC03	3	1	0	4 HOURS	30	70	4

## Python Programming

### Course Objectives:

1. Learn Syntax and Semantics and create Functions in Python.
2. Handle exceptions, Strings and modules in Python.
3. Understand Lists, Dictionaries and Regular expressions in Python.
4. Implement Graphical User Interface (GUI) concepts in Python.
5. Build Web Services with introduction to Network programming and Database Programming in Python.

**UNIT - I** Python Basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules Sequences - Strings, Lists, and Tuples, Mapping and Set Types.

**UNIT - II** FILES: File Objects, File Built-in Function [ open() ], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, \*Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, \*Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules.

**UNIT - III** Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules.

**UNIT - IV** GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs WEB Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application Advanced CGI, Web (HTTP) Servers.

**UNIT - V** Database Programming: Introduction, Python Database Application Programmer's Interface (DB-API), Object Relational Managers (ORMs), Related Modules.

### TEXT BOOKS:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

### REFERENCES BOOKS:

1. Think Python, Allen Downey, Green Tea Press.

2. Introduction to Python, Kenneth A. Lambert, Cengage.
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
4. Learning Python, Mark Lutz, O'Really.

**Course Outcomes:**

1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
2. Demonstrate proficiency in handling exceptions and Strings and modules.
3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
4. Interpret and implement the concepts of GUI used in Python.
5. Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

**Course Outcomes and their mapping with Programme Outcomes:**

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3								3	3	2
CO2	3	3	3	3	3								3	3	2
CO3	3	3	3	3	3								3	3	2
CO4	3	3	3	2	2								3	3	3
CO5	3	2	2	2	2								3	3	3

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPE11	3	0	0	3 HOURS	30	70	3

## Software Engineering

### Course Objectives:

1. Knowledge of basic SW engineering methods and practices, and their appropriate application.
2. To provide the idea of decomposing the given problem into Analysis, Designing, Implementation, Testing and Maintenance phases.
3. To provide an idea of using various process models in the software industry according to given circumstances.
4. Understanding of implementation issues such as modularity and coding standards.
5. To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.

**UNIT I** Software Engineering – What is software, Characteristics of software, Application of software, Software Development Life Cycle, Software Process Models - Linear Sequential model, Prototype model, RAD model, Incremental model, Component Based Development Model, Fourth Generation Techniques.

**UNIT II** . Software Requirement Specification-Problem Analysis, Requirement Specification, Validation, metrics, monitoring and control.

**UNIT III** System Design - Problem portioning, abstraction, top-down and bottom-up design, Structured approach, Coupling and Cohesion, Functional versus Object oriented approach, design specification and verification, metrics.

**UNIT IV** Coding: Top-down and bottom-up structured programming, information hiding, programming style, internal documentation, verification. Metrics, Monitoring and Control

**UNIT V** Software testing – Software Testing fundamentals, Black Box Testing, White box testing, Basics path testing, A strategic Issues, Types of Testing-Unit testing, Integration testing, validation testing, System Testingsoftware metrics, software evaluation, software maintenance & reliability.

### List of Books:

1. Software Engg, Pressmen
2. Software Engg, Pankaj Jalote
3. Software Engg, Shaum's Outline Series
4. Fundamentals of Software Engineering, Rajib Mal.

### Course Outcomes :

1. Knowledge of basic SW engineering methods and practices, and their appropriate application.
2. To provide the idea of decomposing the given problem into Analysis, Designing, Implementation, Testing and Maintenance phases.
3. To provide an idea of using various process models in the software industry according to given circumstances.
4. Understanding of implementation issues such as modularity and coding standards.
5. To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	2	2							3	3	2
CO2	3	2	3	2	3	2							3	3	2
CO3	2	2	2	3	2	2							3	3	2
CO4	2	3	3	2	3	2							3	3	2
CO5	3	3	2	3	2	2							3	3	2

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPE12	3	0	0	3 HOURS	30	70	3

## Real Time System

### Course Objectives:

The objective of this course is to

1. Develop an understanding of various Real Time systems Application
2. Obtain a broad understanding of the technologies and applications for the emerging and exciting domain of real-time systems
3. Get in-depth hands-on experience in designing and developing a real operational system.

### UNIT I - INTRODUCTION TO TASK SCHEDULING

Introduction - Issues in Real Time Computing, Structure of a Real Time System, Task classes, Performance Measures for Real time Systems, Task Assignment and Scheduling – Classical uni processor scheduling algorithms, RM algorithm with different cases-Priority ceiling precedence constraints- using of primary and alternative tasks.

### UNIT II - UNI AND MULTI PROCESSOR SCHEDULING

Uniprocessor scheduling of IRIS tasks, Task assignment, Utilization balancing – Next fit- Bin packing- Myopic off-line - Focused addressing and bidding- Buddy strategy- Fault Tolerant Scheduling.-Aperiodic scheduling - Spring algorithm, Horn algorithm- Bratley. - Sporadic scheduling.

### UNIT III - REAL TIME COMMUNICATION

Introduction – VTCSMA – PB CSMA- Deterministic collision resolution protocol- DCR for multi packet messages- dynamic planning based- Communication with periodic and aperiodic messages.

### UNIT IV - REAL TIME DATABASES

Basic Definition, Real time Vs General purpose databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency control issues, Disk Scheduling Algorithms, Two-phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time System.

### UNIT V - REAL-TIME MODELING AND CASE STUDIES

Petrinets and applications in real-time modeling, Air traffic controller system – Distributed air defense system.

### References

1. C.M. Krishna, Kang G. Shin, “*Real Time Systems*”, Tata McGraw - Hil, 2010.
2. Giorgio C. Buttazzo , “*Hard real-time computing systems: predictable scheduling algorithms and applications*” , Springer, 2008.
3. C. Siva Ram Murthy, G. Manimaran, “*Resource management in real-time systems and networks*”, PHI, 2009.

### Course Outcomes :

On completion of this course, the students will be able to

1. Understand concepts of Real-Time systems and modeling.
2. Recognize the characteristics of a real-time system.
3. Understand and develop document on an architectural design of a real-time system.
4. Develop and document Task scheduling, resource management, real-time operating systems and fault tolerant applications of Real-Time Systems.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	3	1	2							2	2	3
CO2	2	2	3	3	2	2							3	3	3
CO3	3	3	3	2	3	3							2	2	2
CO4	2	1	2	2	2	2							2	2	3

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPE13	3	0	0	3 HOURS	30	70	3

## Cyber Law & Ethics

### **Course Objectives:**

Basic understanding of current cyber security laws and the ethical principles involved. Includes describing and evaluating the impact of various laws and regulations in an industry or business. Also includes the importance of policies, procedures, guidelines, and information classification; risk identification; evaluation and mitigation and the role of compliance.

### **Unit I**

Fundamentals of Cyber Space, Understanding Cyber Space, Interface of Technology and Law Defining Cyber Laws

### **Unit II**

Jurisdiction in Cyber Space, Concept of Jurisdiction, Internet Jurisdiction, Indian Context of Jurisdiction, International position of Internet Jurisdiction Cases in Cyber Jurisdiction

### **Unit III**

E-commerce- Legal issues, Legal Issues in Cyber Contracts, Cyber Contract and IT Act 2000, The UNCITRAL Model law on Electronic Commerce

### **Unit IV**

Intellectual Property Issues and Cyberspace – The Indian Perspective, Overview of Intellectual Property related Legislation in India. Copyright law & Cyberspace, Trademark law & Cyberspace, Law relating to Semiconductor Layout & Design

### **Unit- V**

Cyberspace law and law enforcement, information warfare and the military, and intelligence in the information age. Information warfare policy and ethical Issues.

### **References**

- 1.Hon C Graff, Cryptography and E-Commerce - A Wiley Tech Brief, Wiley Computer Publisher, 2001.
- 2.Michael Cross, Norris L Johnson, Tony Piltzecker, Security, Shroff Publishers and Distributors Ltd.

### **Course Outcomes :**

1. Explain the ethical and legal ramifications of accessing, using, and manipulating data in today's society.
2. Implement examples of modern compliance in relation to NIST and other applicable standards, laws, and regulations.
3. Apply ethical and moral behaviors when implementing and using information technology.
4. Develop The Understanding Of Relationship Between Commerce and Cyberspace.

5. The students will be able to know and learn web technologies and related issues.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	3	3							2	3	2
CO2	3	2	3	2	2	3							3	3	2
CO3	2	3	2	3	3	2							3	2	3
CO4	3	2	2	3	2	2							2	3	3
CO5	2	3	3	3	3	3							3	2	3

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205TPE14	3	0	0	3 HOURS	30	70	3

## Embedded Systems

### Course Objectives:

The students will learn and understand

1. The basic concepts of Embedded Systems
2. The applications of embedded systems involving real-time programming of microcontrollers.

### UNIT 1: Introduction of Embedded systems

An Embedded system, processor in system, Hardware units, Software embedded in systems, Exemplary Embedded systems, Embedded Systems-On-Chip(SOC) and VLSI circuit.

### UNIT 2: Processor and memory Organization

Structural units in a Processor, Processor selection for an embedded system, memory devices, memory selection for an embedded system, allocation of memory to programme segments and blocks and memory map of a system, direct memory access, Interfacing Processor, memories and I/O devices.

### UNIT 3: Devices and Buses for Device Network

I/O devices, Timer and counting devices, Serial communication using 'I<sup>2</sup>-C', 'CAN' and advanced I/O buses, between the networked multiple devices, Host system or computer parallel communication between the networked I/O multiple devices using the ISA,PCI, PCI-X and advanced buses.

### UNIT 4: Devices Drivers and Interrupts Service Mechanism

Device drivers, parallel port device drivers in a system, serial port device drivers in a system, Device drivers for Internal programmable timing devices, Interrupt Servicing (Handling) Mechanism, context and periods for context-switching, deadline and interrupt latency.

### UNIT 5: Hardware-Software Co-design in an Embedded System

Embedded System project management, Embedded System design and co-design issues in system development process, design cycle in the development phase for an embedded system, uses of target systems or its emulator and in-circuit emulator (ICE), use of software tools for development for an embedded system, use of scopes and logic analysers for system hardware tests, Issues in embedded system design.

### REFERENCES

1. Embedded Systems (Architecture, programming and design) by Raj Kamal ,Tata McGraw-Hill Publishing Company Limited.
2. Embedded systems design by Rajeshwar Singh, Dhanpat Rai publications.

### Course Outcomes :

On completion of this course, the students will be able to

1. Learn the basic concepts of Embedded programming and systems to perform a specific task
2. identify the various processors, memory organizations and interrupts services
3. Acquire knowledge about devices and buses used in embedded networking
4. Acquire knowledge about the basic concept of circuit emulators.
5. Gain an understanding of applications of embedded systems involving real-time programming of

microcontrollers

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	1							3		1	2
CO2	3	3	3	1	1							3		1	2
CO3	3	3	2	1	3	1						3		2	2
CO4	3	3	3	1	3							3		2	2
CO5	3	3	3	1	3							3		2	2

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205PPC01	0	0	4	4 HOURS	30	20	2

## Database Management Systems Lab

### Course Objectives:

This course is designed to enable the students to:

1. Introduce ER data model, database design and normalization.
2. Learn SQL basics for data definition and data manipulation.

S.No.	Experiments
1	Concept design with E-R Model.
2	Relational Model.
3	Normalization.
4	Practicing DDL commands.
5	Practicing DML commands.
6	Querying (using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.).
7	Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.
8	Triggers (Creation of insert trigger, delete trigger, update trigger).
9	Procedures.
10	Usage of Cursors.

### TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill, 3rd Edition
2. Database System Concepts, Silberschatz, Korth, McGraw Hill, V edition.

### REFERENCES BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, ElmasriNavrate, Pearson Education.
3. Introduction to Database Systems, C.J. Date, Pearson Education.
4. Oracle for Professionals, The X Team, S. Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.

### Course Outcomes:

At the end of this course the student can answer how to:

1. Design database schema for a given application and apply normalization.
2. Acquire skills in using SQL commands for data definition and data manipulation.
3. Develop solutions for database applications using procedures, cursors and triggers.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	3				1			1	3	2	1
CO2	3	1	2	1	3				1			1	3	1	1
CO3	3	1	2	2	3				1			1	3	2	1

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205PPC02	0	0	4	4 HOURS	30	20	2

## Python Programming Lab

### Course Objectives:

This course is designed to enable the students to:

1. To be able to introduce core programming basics and program design with functions using Python programming language.
2. To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
3. To understand the high-performance programs designed to strengthen the practical expertise.

S.No.	Experiments
1	Write a program to demonstrate different number data types in Python.
2	Write a program to perform different Arithmetic Operations on numbers in Python.
3	Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4	Write a python script to print the current date in the following format "Sun May 29 02:26:23 IST 2017".
5	Write a program to create, append, and remove lists in python.
6	Write a program to demonstrate working with tuples in python.
7	Write a program to demonstrate working with dictionaries in python.
8	Write a python program to find largest of three numbers.
9	Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [ Formula : $c/5 = f-32/9$ ]
10	Write a Python script that prints prime numbers less than 20.
11	Write a python program to find factorial of a number using Recursion.
12	Write a program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides).
13	Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.
14	Write a python program to define a module to find Fibonacci Numbers and import the module to another program.
15	Write a python program to define a module and import a specific function in that module to another program.
16	Write a Python class to convert an integer to a roman numeral.
17	Write a Python class to implement pow(x, n).
18	Write a Python class to reverse a string word by word.

### TEXT BOOKS:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

### REFERENCES BOOKS:

1. Think Python, Allen Downey, Green Tea Press.
2. Introduction to Python, Kenneth A. Lambert, Cengage.

3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
4. Learning Python, Mark Lutz, O'Really.

**Course Outcomes:**

At the end of this course the student can answer how to:

1. Student should be able to understand the basic concepts scripting and the contributions of scripting language.
2. Ability to explore python especially the object-oriented concepts, and the built in objects of Python.
3. Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations.

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3								3	3	3
CO2	3	3	3	3	3								3	3	3
CO3	3	3	3	3	3								3	3	3

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205PMC01	-	-	2	2 HOURS	-	-	0

### Constitution of India

#### Course Objectives:

1. To realise the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution.
2. To identify the importance of fundamental rights as well as fundamental duties.
3. To understand the functioning of Union, State and Local Governments in Indian federal system.
4. To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.

**Unit I** Introduction Constitution' meaning of the term,, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy

**Unit II** Union Government and its Administration Structure of the Indian Union: Federalism, Centre-State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha

**Unit III** State Government and its Administration Governor: Role and Position, CM and Council of ministers, State Secretariat: Organisation, Structure and Functions

**Unit IV** Local Administration District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Pachayati raj: Introduction, PRI: Zila Pachayat, Elected officials and their roles, CEO Zila Pachayat: Position and role, Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

**Unit V** Election Commission 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

#### Books Recommended:

1. 'Indian Polity' by Laxmikanth
2. 'Indian Administration' by Subhash Kashyap
3. 'Indian Constitution' by D.D. Basu
4. 'Indian Administration' by Avasti and Avasti

#### Course Outcomes :

At the end of the course the student should be able to:

1. Understand and explain the significance of Indian Constitution as the fundamental law of the land.
2. Exercise his fundamental rights in proper sense at the same time identifies his responsibilities in national building.
3. Analyse the Indian political system, the powers and functions of the Union, State and Local Governments in detail
4. Understand Electoral Process, Emergency provisions and Amendment procedure
5. Describe the importance of Preamble of the Indian Constitution and its significance..

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	2							3	2	3	2
CO2	2	3	2	2	1							3	2	2	3
CO3	3	2	2	3	2							3	2	3	2
CO4	3	2	2	2	3							3	2	2	3
CO5	2	3	2	3	2							2	3	3	2

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT205PMC01	-	-	2	2 HOURS	-	-	0

## Essence of Indian Traditional Knowledge

### Course Objectives:

1. To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.
2. To make the students understand the traditional knowledge and analyze it and apply it to their day to day life.

### Unit 1

Basic Structure of Indian Knowledge System

### Unit2

Modern Science and Indian Knowledge System

### Unit 3

Yoga

### Unit 4

Holistic Health care

### Unit 5

Case Studies.

### Suggested Text/Reference Books

1. V. Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014
2. Swami Jitatmanand, Modern Physics and Vedant, Bharatiya Vidya Bhavan
3. Fritzo Capra, Tao of Physics
4. Fritzo Capra, The wave of Life
5. V N Jha ( Eng. Trans.), Tarkasangraha of Annam Bhatta, International Chinmay Foundation, Velliarnad, Amakuam
6. Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkatta
7. GN Jha ( Eng. Trans.) Ed. R N Jha, Yoga-darshanam with Vyasa Bhashya, VidyanidhiPrakasham, Delhi, 2016
8. RN Jha, Science of Consciousness Psychotherapy and Yoga Practices, VidyanidhiPrakasham, Delhi, 2016
9. P R Sharma ( English translation), ShodashangHridayam

### Course Outcomes :

At the end of the Course, Student will be able to:

1. Identify the concept of Traditional knowledge and its importance.
2. Explain the need and importance of protecting traditional knowledge.
3. Illustrate the various enactments related to the protection of traditional knowledge.
4. Interpret the concepts of Intellectual property to protect the traditional knowledge.
5. Explain the importance of Traditional knowledge in Agriculture and Medicine.

### Course Outcomes and their mapping with Programme Outcomes:

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	3	2								2	3	2
CO2	3	2	2	2	2								3	2	2
CO3	3	2	2	2	3								3	2	3
CO4	3	3	2	2	3								2	3	2
CO5	2	2	3	3	2								3	3	2

**Weightage: 1-Sightly, 2-Moderately, 3-Strongly**