Er. PERUMAL MANIMEKALAI COLLEGE OF ENGINEERING

(An Autonomous Institution–Affiliated to Anna University, Chennai)

Koneripalli, Hosur – 635117.

PMC TECH

INSPIRE TO INNOVATE

ACADEMIC REGULATIONS 2023 (R23)

Syllabi for III and IV Year

(Version I)

B.TECH- INFORMATION TECHNOLOGY

(Applicable from 2023 -24 onwards)

REGULATIONS 2023 - AUTONOMOUS

CHOICE BASED CREDIT SYSTEM

B. TECH. INFORMATION TECHNOLOGY

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's):

PEO1	Establish themselves as professionals by applying their technical skills to solve real world problems and to meet the diversified needs of industry, academia and research.
PEO2	Exhibit academic excellence with innovative insights to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context
PEO3	Pursue lifelong learning to understand technical issues related to computing systems and to design optimal solutions.

PROGRAMME OUTCOMES (POs):

- **PO1 Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2 Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3 Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4 Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5 Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

CHAIRMAN BOS

DIRECTOR - ACADEMICS

- **PO6 The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7 Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9 Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **P10 Communication:** Communicate effectively on complex engineering activities with the
- Engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **P11 Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **P12 Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

PSO1: To apply emerging technologies to solve real-world problems and to communicate the benefits of emerging technologies to stakeholders.

PSO2: Graduates have a strong understanding of the potential impact of emerging technologies on the IT industry.

PEO's/PO's MAPPING

PEO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PEO1		3	3	2	1	2	1	3	3	3	3	3	1	2	2
PEO2		3	3	3	1	2	2	3	3	2	2	3	1	3	3
PEO3		3	3	3	2	1	1	3	2	2	3	3	2	2	2

REGULATIONS 2023-AUTONOMOUS

CHOICE BASED CREDIT SYSTEM

B. TECH. INFORMTION TECHNOLOGY

CURRICULUM I TO VIII SEMESTERS

SEMESTER I

S. NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
		Induction Programme – 2 Weeks	-	-	-	-	-	0
THEORY								
1.	PUCC1HM01	Professional English - I	HM	2	-	-	2	2
2.	PUCC1BS01	Matrices and Calculus	BS	3	1	-	4	4
3.	PUCC1BS02	Engineering Physics	BS	3	-	-	3	3
4.	PUCC1BS03	Engineering Chemistry	BS	3	-	-	3	3
5.	PUCC1BE01	Engineering Graphics	BE	2	-	4	6	4
6.	PUCC1HM02	Heritage of Tamils தமிழர்மரபு	HM	1	-	-	1	1
PRACTICALS								
7.	PUCC1PL01	Professional English - I	HM	-	-	4	4	2
8.	PUCC1PL02	Physics and Chemistry Laboratory	BS	-	-	4	4	2
9.	PUCC1HM03	Wellness	HM	-	-	1	1	0
		TOTAL		**14**	**1**	**13**	**28**	**21**

SEMESTER II

S. NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	PUCC2HM04	Professional English-II	HM	2	-	-	2	2
2.	PUCC2BS04	Statistics and Numerical methods	BS	3	1	-	4	4
3.	PUCS2BS05	Physics For Information Science	BS	3	-	-	3	3
4.	PUIT2BE03	Introduction to IT Essentials	BE	3	-	-	3	3
5.	PUCC2BE02	Basic Electrical & Electronics Engineering	BE	3	-	-	3	3
6.	PUCC2BE04	Problem Solving using Python Programming	BE	2	-	-	2	2
7.	PUCC2HM05	Tamils and Technology தமிழரும்ததொழில்நுட்பமும்	HM	1	-	-	1	1
PRACTICALS								
8.	PUCC2PL03	Professional English – II	HM	-	-	4	4	2
9.	PUCC2PL04	Problem Solving using Python Programming Laboratory	BE	-	-	4	4	2
10	PUCC2PL05	Civil and Mechanical Engineering Practices Laboratory	BE	-	-	2	2	1
11	PUCC2PL06	Electrical and Electronics Engineering Practices Laboratory	BE	-	-	2	2	1
12	PUCC2HM06	Wellness	HM	-	-	1	1	0
		TOTAL		**17**	**1**	**13**	**31**	**24**

SEMESTER III

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	PUCS3BS06	Mathematics for Computer science and Engineering	BS	3	1	-	4	4
2.	PUEC3PC01	Digital Logic and Microprocessor	PC	3	1	-	4	4
3.	PUAD3PC09	Artificial Intelligence	PC	3	-	-	3	3
4.	PUCS3TL03	Data Structures and Algorithms	PC	3	-	2	5	4
5.	PUCS3PC04	Object Oriented Programming	PC	3	-	-	3	3
6.	PUCC3MCXX	Mandatory Course – I (Non-Credit)	MC	3	-	-	3	0
PRACTICALS								
7.	PUCS3PL02	Object Oriented Programming Laboratory	PC	-	-	4	4	2
8.	PUCC3HM07	Extension Activities	HM	-	-	1	1	0
		TOTAL		**18**	**2**	**7**	**27**	**20**

SEMESTER IV

S. NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	PUCC4BS07	Environmental Sciences & Sustainability	BS	3	-	-	3	3
2.	PUCS3PC01	Computer Organization and Architecture	PC	3	1	-	4	4
3.	PUIT4PC01	Information Retrieval	PC	3	-	-	3	3
4.	PUIT4PC02	Operating Systems	PC	3	-	-	3	3
5	PUIT4PC03	Database Management Systems	PC	3	-	-	3	3
6.	PUCC4MCXX	Mandatory Course – II (Non-Credit)	MC	3	-	-	3	0
PRACTICAL								
7.	PUIT4PL01	Operating Systems Laboratory	PC	-	-	4	4	2
8.	PUIT4PL02	Database Management Systems Laboratory	PC	-	-	4	4	2
9.	PUCC4HM08	Extension Activities	HM	-	-	1	1	0
10		In-plant Training/Internship	SD	-	-	-	-	-
		TOTAL		**18**	**1**	**9**	**28**	**20**

- In-plant-Training – 2 Weeks of training each during 4th/5th/6th Semester – During college hours or semester vacation. The Marks will be reflected on 7 th semester grade sheet.
- Total 4 weeks of Training – 2 Credits

SEMESTER - V

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	PUCC5HM09	Universal Human Values & Ethics	HM	3	-	-	3	3
2.	PUIT5PC04	TCP/IP Protocol Suite	PC	3	-	-	3	3
3.	PUIT5TL05	Software Engineering - Principles and practices	PC	2	-	2	4	3
4.	PUIT5PEXX	Professional Elective – I	PE	3	-	-	3	3
5.	PUIT5PEXX	Professional Elective – II	PE	3	-	-	3	3
6.	PUIT5PEXX	Professional Elective – III	PE	3	-	-	3	3
7.	PUIT5SD01	Industry Lecture	SD	-	-	-	1	0
PRACTICAL								
8.	PUIT5PL03	Socket Programming Laboratory	PC	-	-	4	4	2
9.	PUCC5SD02	Professional Development Laboratory-I	PD	-	-	2	2	1
10.		In-plant Training	SD	-	-	-	-	-
		TOTAL		**17**	**0**	**8**	**26**	**21**

- In – Plant Training / Internship - 2 Weeks of Training each during $4^{th}/5^{th}/6^{th}$ Semester – During College hours or semester vacation. It will be reflected on 7^{th} sem grade sheet.
- Total 4 weeks of Training - 2 Credits

SEMESTER - VI

S.NO.	COURSE CODE	COURSE NAME	CAT E-GOR Y	PERIODS PER WEEK			TOTAL CONTAC T PERIODS	CREDIT S
				L	T	P		
THEORY								
1.	PUCS6PC08	Compiler Design	PC	3	1	-	4	4
2.	PUCS6TL09	Embedded Systems And IOT	PC	2	-	2	4	3
3.	PUIT6PEXX	Professional Elective – IV	PE	3	-	-	3	3
4.	PUCC6OE01	Open Elective –I Entrepreneurship Development	OE	3	-	-	3	3
5.		Open Elective – II	OE	3	-	-	3	3
6.	PUIT6SD03	Industry Lecture	SD	-	-	-	1	0
PRACTICAL								
7.	PUCS6PL05	Compiler Design Laboratory	PC	-	-	4	4	2
8.	PUCC6SD04	Professional Development Laboratory-II	PD	-	-	2	2	1
9.	PUIT6SD05	Technical Skill Development-I	SD	-	-	2	2	1
10.		In-plant Training	SD	-	-	-	-	-
		TOTAL		**14**	**1**	**10**	**26**	**20**

- In – Plant Training / Internship - 2 Weeks of Training each during 4th/5th/6th Semester – During College hours or semester vacation. It will be reflected on 7th sem grade sheet.
- Any one Open Elective has to be chosen from the management verticals
- Total 4 weeks of Training - 2 Credits

SEMESTER - VII

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	PUCS7PC09	Cryptography and Cyber Security	PC	3	1	-	4	4
2	PUIT7PC07	Mobile Application and Development	PC	3	-	-	3	3
3	PUIT7PEXX	Professional Elective – V	PE	3	-	-	3	3
4	PUIT7PEXX	Professional Elective – VI	PE	3	-	-	3	3
5		Open Elective – III	OE	3	-	-	3	3
6		Open Elective – IV	OE	3	-	-	3	3
PRACTICAL								
7	PUIT7PL07	Mobile Application Development Laboratory	PC	-	-	4	4	2
8	PUCS7PL07	Security Laboratory	PC	-	-	4	4	2
9	PUIT7SD06	Technical Skill Development-II	SD	-	-	2	2	1
10	PUIT7PR01	Project Phase – I	Project	-	-	2	2	1
11	PUIT7SD07	In-plant Training	SD	-	-	-	-	2
		TOTAL		**18**	**1**	**12**	**31**	**27**

SEMESTER - VIII

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	PUIT8PR02	Project Phase – II / Internship	Project	-	-	24	24	10
		TOTAL		**-**	**-**	**24**	**24**	**10**

- Project - Mandatory
- Internship - Optional (Preferred) – 3 Months to 6 Months

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MANDATORY COURSES I

(Semester – III)

Sl. No.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS
				L	T	P	
1.	PUCC3MC01	Women and Gender Studies	MC	3	0	0	3
2.	PUCC3MC02	Elements of Literature	MC	3	0	0	3
3.	PUCC3MC03	Film Appreciation	MC	3	0	0	3
4.	PUCC3MC04	The Constitution ofIndia	MC	3	0	0	3

MANDATORY COURSES II

(Semester – IV)

Sl. No.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS
				L	T	P	
1.	PUCC4MC01	Practices for well being	MC	3	0	0	3
2.	PUCC4MC02	Indian History of Science andTechnology	MC	3	0	0	3
3.	PUCC4MC03	Political and Economic Thought for a Humane Society	MC	3	0	0	3
4.	PUCC4MC04	Sociology, Society and Culture	MC	3	0	0	3

SUMMARY

B.Tech -INFORMATION TECHNOLOGY									
	Subject Area	I	II	III	IV	V	VI	VII/VIII	Total Credits
S.NO		Credits Per Semester							
1	HM	5	5			3			13
2	BS	12	7	4	3				26
3	BE	4	12						16
4	PC			16	17	8	9	11	61
5	PE					9	3	6	18
6	OE						6	6	12
7	PR							11	11
8	MC								0
9	SD					1	2	3	6
Total		21	24	20	20	21	20	37	163

TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 163

HM	Humanities, Management, Wellness & Extension
BS	Basic Science
BE	Basic Engineering
PC	Professional Core
PE	Professional Elective
OE	Open Elective
MC	Mandatory Non-Credit
PR	Project
SD	Professional Development, In-plant Training/Internship, Industrial lecture ,Value added Courses

SEMESTER – V

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
11.	PUCC5HM09	Universal Human Values & Ethics	HM	3	-	-	3	3
12.	PUIT5PC04	TCP/IP Protocol Suite	PC	3	-	-	3	3
13.	PUIT5TL05	Software Engineering - Principles and practices	PC	2	-	2	4	3
14.	PUIT5PEXX	Professional Elective – I	PE	3	-	-	3	3
15.	PUIT5PEXX	Professional Elective – II	PE	3	-	-	3	3
16.	PUIT5PEXX	Professional Elective – III	PE	3	-	-	3	3
17.	PUIT5SD01	Industry Lecture	SD	-	-	-	1	0
PRACTICAL								
18.	PUIT5PL03	Socket Programming Laboratory	PC	-	-	4	4	2
19.	PUCC5SD02	Professional Development Laboratory-I	PD	-	-	2	2	1
20.		In-plant Training	SD	-	-	-	-	-
		TOTAL		**17**	**0**	**8**	**26**	**21**

- In – Plant Training / Internship - 2 Weeks of Training each during 4th/5th/6th Semester – During College hours or semester vacation. It will be reflected on 7th sem grade sheet.
- Total 4 weeks of Training - 2 Credits

PUCC5HM09	UNIVERSAL HUMAN VALUES AND ETHICS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- Development of a holistic perspective based on self-exploration about themselves (human being), family, Environment, Society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, Environment, society and nature/existence.
- Strengthening of self-reflection
- Development of commitment and courage to act.

UNIT - I	INTRODUCTION TO VALUE EDUCATION	9

Understanding Value Education - Self-exploration as the Process for Value Education - Continuous Happiness and Prosperity – the Basic Human Aspirations - Right Understanding, Relationship and Physical Facility - Happiness and Prosperity – Current Scenario - Method to Fulfil the Basic Human Aspirations

UNIT - II	HARMONY IN THE HUMAN BEING	9

Understanding Human being as the Co-existence of the Self and the Body - Distinguishing between the Needs of the Self and the Body - The Body as an Instrument of the self- Understanding Harmony in the Self - Harmony of the Self with the Body -Programme to Ensure self-regulation and Health

UNIT - III	HARMONY IN THE FAMILY AND SOCIETY	9

Harmony in the Family – the Basic Unit of Human Interaction - Values in Human-to-Human Relationship - 'Trust' – the Foundational Value in Relationship - 'Respect' – as the Right Evaluation - Understanding Harmony in the Society - Vision for the Universal Human Order

UNIT - IV	HARMONY IN THE NATURE (EXISTENCE)	9

Understanding Harmony in the Nature - Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature - Realizing Existence as Co-existence at All Levels - The Holistic Perception of Harmony in Existence

UNIT - V	IMPLICATIONS OF THE HOLISTIC UNDERSTANDING - A LOOK AT PROFESSIONAL ETHICS	9

Natural Acceptance of Human Values - Definitiveness of (Ethical) Human Conduct - understanding and applying Engineering code of Ethics, Balancing Engineering Practices with legal requirements – Integrity- A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order - -Competence in Professional Ethics - Holistic Technologies, Production Systems and Management Models-Typical Case Studies - Strategies for Transition towards Value-based Life and Profession

TOTAL : 45 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Evaluate the significance of value inputs in formal education and start applying them in their life and profession	Understand
CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.	Understand
CO3	Analyse the value of harmonious relationship based on trust and respect in their life and profession	Analyse
CO4	Examine the role of a human being in ensuring harmony in society and nature	Evaluate
CO5	Apply the understanding of ethical conduct to formulate the strategy for ethical life and profession.	Apply

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	1	-	-	-	-	2	1	3	2	2	-	3	1	1
2	1	-	-	-	-	2	1	3	2	2	-	3	1	1
3	1	-	-	-	-	2	1	3	2	2	-	3	1	1
4	1	-	-	-	-	2	1	3	2	2	-	3	1	1
5	1	-	-	-	-	2	1	3	3	2	-	3	2	2

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:
1. R R Gaur, R Asthana, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019.
2. The Teacher's Manual R R Gaur, R Asthana, G P Bagaria, A Foundation Course in Human Values and Professional Ethics – Teachers Manual, 2nd Revised Edition, Excel Books, New Delhi, 2019
REFERENCE BOOKS:
1. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004
WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:
1. NPTEL Course: Moral Thinking; An Introduction to Values and Ethics, Prof, Vineet Sahu, IIT, Kanpur. 2. http://www.uptu.ac.in/ 3. http://www.uhv.org.in

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PUIT5PC04	TCP/IP PROTOCOL SUITE	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- Gain in-depth knowledge of the layered structure and real-world applications in networking
- Examine the services including connectionless communication, message-oriented delivery, and minimal error checking
- To understand the principles, features, and mechanisms of TCP
- To comprehend the operations, configurations, and data transfer mechanisms in network communication.
- To explore the error handling, neighbour discovery, and group communication

UNIT - I	NETWORK LAYER	9

The OSI Model and The TCP/IP Protocol Suite: Protocol Layers, The OSI Model, TCP/IP Protocol suite and Addressing.**IPV4:** Addresses- Introduction, Classful and Classless Addressing, **Mobile IP:**Addressing-Agents-Three phases-Inefficiency in Mobile IP

UNIT - II	TRANSPORT LAYER	9

Introduction to the Transport Layer: Transport Layer Services - Transport Layer Protocols. **User Datagram Protocol (UDP):**– Introduction, User Datagram, UDP Services- Applications,-UDP Package

UNIT - III	TRANSMISSION CONTROL PROTOCOL	9

TCP:TCP Services, Features, Segment, TCP Connection, Windows in TCP.-Flow Control,-Error Control,-Congestion Control- TCP Timers- Options and TCP Package

UNIT - IV	APPLICATION LAYER	9

Introduction to Application Layer: Peer-to-Peer paradigm. **Host Configuration DHCP**: Introduction-DHCP Operation-Configuration. **Domain Name System (DNS):** Need for DNS-Name Space-DNS in the internet-Resolution-DNS Message. **File Transfer (FT):** Connection-Communication-File Transfer

UNIT - V	NEXT GENERATION- IPV6 ADDRESSING	9

IPv6 Protocol - Introduction, Packet Format, Transition from IPv4 to IPv6. **ICMPv6** - Introduction, Error Messages, Informational Messages, Neighbor- Discovery Messages, Group Membership Messages.(lab utilization to complete)

TOTAL : 45 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Describe the network protocols to achieve efficient, secure and scalable communication systems.	Understand
CO2	Explain the services and protocols of the transport layer	Understand
CO3	Apply TCP services and mechanisms for efficient network communication.	Apply
CO4	Apply application layer concepts to optimize network services	Apply
CO5	Evaluate the impact of IPv6 and ICMPv6 on network performance and interoperability.	Evaluate

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2	2	3	2	-	-	-	2	1	-	2	3	2
2	3	1	1	1	1	-	1	-	1	1	-	1	3	2
3	3	2	3	2	2	-	1	-	2	1	-	2	3	2
4	3	2	2	3	1	-	1	-	2	1	-	2	3	2
5	3	3	2	3	3	-	1	-	2	1	-	2	3	2

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. Behrouz A.Forouzan "TCP/IT Protocol Suite" Fourth Edition Pearson Education, 2010

REFERENCE BOOKS:

1. Lydia Parziale David T. Britt Chuck Davis Jason Forrester Wei Liu Carolyn Matthews Nicolas Rosselot "TCP/IP Tutorial and Technical Overview" ,IBM,Eighth Edition (December 2006)

2. Behrouz A.Forouzan "Data Communication and Networking with Protocol Suite" Sixth Edition,2022.

3. Craig Hunt "TCP/IP Network Administration" O'Reilly Media, Inc,Third Edition, April 2002

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://archive.nptel.ac.in/courses/106/105/106105183/
2. https://www.javatpoint.com/computer-network-tcp-ip-model
3. https://www.coursera.org/learn/tcpip
4. https://www.tutorialspoint.com/tcp-ip-in-computer-networking
5. https://www.cisco.com/c/en/us/support/docs/ip/routing-information-protocol-rip/13769-5.html

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PUIT5TL05	SOFTWARE ENGINEERING-PRINCIPLES AND PRACTICE	L	T	P	C
		2	0	2	3

COURSE OBJECTIVE

- Understand Software Development Processes
- Learn Software Requirements and Analysis
- Familiarize students with design patterns, object-oriented design, and user interface design principles.
- Explore OODBMS Architecture and Implementation
- Apply Software Development Management Concepts in Real Projects

UNIT - I	BASICS OF SOFTWARE ENGINEERING	6

Introduction to Software Engineering: Software, What is Good Software, Software Engineering, Components of Software Engineering, Software Development Models, Software Estimation:Sotware Metrics,COCOMO,Software Cost Estimation, Software Risk Management: Software Risk Management(SRM),Risk Management through RMMM Plan, Quality Engineering for Software Quality Assurance: Qualities 9001 Standard, Software Quality and Assurance, Software Engineering Tools.

UNIT - II	SOFTWARE ENGINEERING : TRADITIONAL APPROACH TO SOFTWARE SYSTEM DEVELOPMENT	6

System Analysis : System modelling- Structured System Analysis-Software Requirement Specification-Information Systems, System Design : Designing Systems-Design Development Process-System Design Architecture-Systems Behaviour Design-Architecture and Non-Functional Requirements-User Interface Design : User Interface-User Interface Analysis and Design-Improving Effectiveness of UI-Guidelines for Designing UI Components, Procedural Design-Program Verification

UNIT - III	OBJECT ORIENTED SYSTEMS ANALYSIS AND DESIGN(OOSAD)	6

Object Orientation and Object Basics: Object Oriented System Development Cycle-Process Framework for OOSAD,The Unified Approach and United Modeling Language: Unified Modeling Language-Static Class Diagram-Use Case Diagram-Behaviour Diagrams, Object Oriented Analysis(OOA) : Introduction-Techniques for Information Gathering for RA-Use Case-Driven OO Analysis-OO Analysis-Development of Classes-Identifying Relationships-Identifying Attributes and Methods.

UNIT - IV	OBJECT ORIENTED DESIGN AND OODBMS	6
OO Design: Introduction-Useful Design Patterns-OOD Process-Design Class-Design Access Layer Classes-Designing View Layer Classes, Object Store and DBMS: Introduction-Object Oriented Database Features-Object Oriented Database Management Systems-Object Oriented Database Products.		
UNIT - V	**MANAGEMENT OF SOFTWARE DEVELOPMENT**	**6**
Software Project Management: Introduction-SPM Basic Concepts-Project Management-Core Functions-Support Functions-Project Integration Management, Software Development Process Management: Management of Software Workflows-Workflow Process Templates-Integration of Software Engineering Management and Project Life Cycle. Requirements Management : User Analysis and Identifying User Needs-Requirement Specifications-Requirement Assurance Through Right System		
		TOTAL : 30 PERIODS

LIST OF EXPERIMENTS:

1. Development of Problem Statements.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques

Lab Requirements:

Software Requirements:

- Rational Rose
- Operating sytem: windows 7/10
- Front end : J2EE
- Back end : My SQL Server
- IDE used : Netbeans

TOTAL : 30(Theory)+30 (lab):60 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Understand Fundamental Software Engineering Concepts	Understand
CO2	Explain the key principles, processes, and terminologies of software engineering in the context of traditional software development.	Understand
CO3	To design software components and systems using object-oriented design principles.	Create
CO4	Model and implement an object-oriented database using concepts like complex objects, inheritance, and relationships.	Analyse
CO5	Apply Project Planning and Scheduling Techniques	Apply

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2	2	3	2	1	-	-	2	1	-	2	3	2
2	3	1	1	1	1	-	1	-	1	-	-	1	2	3
3	3	2	3	2	2	-	-	-	2	1	-	2	3	1
4	3	2	2	3	1	-	1	-	2	1	-	2	2	2
5	3	3	2	3	3	1	1	-	2	1	-	2	3	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:
1. Waman S Jawadekar "Software Engineering -Principles and Practice",first edition,2004,Tata McGraw-Hill Companies
2. Hans Van Vliet "Software Engineering -Principles and Practice,"Third edition, January 2010,Wiley student Edition.
REFERENCE BOOKS:
1. Rohit Khurana "Software Engineering -Principles and Practice",Second Edition,2010,Vikas Publishing.
2. Deepak Jain "Software Engineering -Principles and Practice" ,first edition,2008,Oxford Higher
WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:
1. https://archive.nptel.ac.in/courses/106/105/106105182/ 2. https://www.coursera.org/specializations/software engineering

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PUIT5PL03	SOCKET PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVE

- Equip students with a comprehensive understanding of network protocols and socket programming.
- Teach the design and implementation of efficient client-server communication systems.
- Develop skills to troubleshoot and optimize network protocols like DNS and HTTP for real-world applications.
- Introduce techniques for broadcast and multicast communication to enhance data distribution across networks.
- Familiarize students with advanced socket options and system calls to improve network performance and security.

LIST OF EXPERIMENTS

1. Study of basic functions of Socket ,programming Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whois
2. Implement a basic client-server application where the client sends a "Hello, World!" message to the server, and the server responds with the same message.
3. Develop a server that echoes back any message it receives from the client.
4. Create a chat server that allows multiple clients to connect and send messages to each other.
5. Write a program that transfers files between a client and a server using sockets.
6. Implement a program that allows a client to execute commands on the server and retrieve the output.
7. Create a basic Domain Name System (DNS) server that resolves domain names to IP addresses.
8. Develop a simple web server that can serve static web pages.
9. Design a server that returns the current date and time to the client.
10. Setting Up an IPv6 Network Environment.
11. Experiment with sending data to multiple clients using broadcasting and multicasting techniques.
12. Demonstrate the usage of advanced socket options like getsockopt(), setsockopt(), getpeername(), and readv() to manage and optimize socket communication

Lab Requirements:

Programming Languages:

- Python
- C/C++
- Java

Integrated Development Environment (IDE):

- Visual Studio Code
- PyCharm
- Eclipse
- NetBeans

TOTAL : 60 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Implement basic client-server communication using sockets	Apply
CO2	Create and manage servers for client requests, including file transfers	Create
CO3	Troubleshoot network protocols like DNS and HTTP	Analyse
CO4	Apply broadcast and multicast communication techniques	Apply
CO5	Optimize network performance using advanced socket options.	Evaluate

CO - PO MAPPING:														
CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2	2	-	2	-	-	-	2	1	-	1	3	2
2	3	3	3	3	2	-	-	-	3	2	-	2	3	2
3	3	3	2	2	3	-	-	-	3	2	-	2	3	3
4	3	2	3	3	2	-	-	-	3	1	-	2	3	2
5	3	3	3	3	3	-	-	-	3	2	-	3	3	3
1 - Low, 2 - Medium, 3- High, '-' - No Correlation														

TEXTBOOKS:

1. W. Richard Stevens, Bill Fenner, and Andrew M. Rudoff "UNIX Network Programming, Volume 1: The Sockets Networking API" Third Edition,Pearson India , January 1, 2015
2. W. Richard Stevens" TCP/IP Illustrated, Volume 1: The Protocols "Tata McGraw Hill Pub. Co. Ltd, Packt Publishing, December 2020

REFERENCE BOOKS:

1. Douglas E. Comer," Internetworking with TCP/IP Volume One: Principles, Protocols, and Architecture Pearson Education, Sixth Edition, New Delhi, 2013.
2. Behrouz A.Forouzan "Data Communication and Networking with Protocol Suite" Sixth Edition,2022.
3. Craig Hunt "TCP/IP Network Administration" O'Reilly Media, Inc,Third Edition, April 2002

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://beej.us/guide/bgnet/
2. https://realpython.com/python-sockets/
3. https://docs.oracle.com/javase/tutorial/networking/sockets/index.html

PUCC5SD02	PROFESSIONAL DEVELOPMENT - I	L	T	P	C
		0	0	2	1

COURSE OBJECTIVE

- **Develop Positive Attitudes**: To help learners understand the components of attitude and its role in personal and professional success, encouraging the development of positive thinking and resilience.
- **Enhance Goal-Setting Skills**: To teach effective goal-setting techniques, including the SMART framework, enabling students to define and pursue short-term and long-term objectives in various aspects of life.
- **Strengthen Business Communication**: To provide learners with a comprehensive understanding of business communication fundamentals, including verbal, non-verbal, and written formats, essential for professional success.
- **Build Quantitative and Analytical Skills**: To improve numerical aptitude and reasoning skills, enabling effective problem-solving in areas such as arithmetic, algebra, and logical reasoning.
- **Foster Professional Communication Skills**: To equip learners with the skills required for professional interactions, such as resume writing, interviews, business networking, and workplace etiquette.

SYLLABUS

Module 1: Introduction to Attitude

Understanding Attitude - Definition and components of attitude - Types of attitudes: Positive, neutral, and negative. **The Importance of a Positive Attitude** - Impact on mental health and relationships - Influence on career and personal growth. **Identifying and Shifting Negative Attitudes** - Recognizing self-limiting beliefs - Strategies to reframe thoughts.

Module 2: Introduction to Goal Setting

The Science of Goal Setting - Why goals are essential for success - Psychological impact of goal achievement - **Types of Goals** - Short-term vs long-term goals - Personal, professional, and social goals - **SMART Goals Framework** - Specific, Measurable, Achievable, Relevant, Time-bound.

Module 3: Professional Communication

Interview Skills - Preparing resumes and cover letters - Behavioral and situational interview techniques - **Business Networking** - Building and maintaining professional networks - Strategies for effective networking at events. **Professional Etiquette** - Dressing for success - Dining and workplace etiquette- Mock Interview (Practical)

Module 4: Verbal Communication

Oral Communication - Effective business conversations - Public speaking and presentation skills - Listening skills: Active listening and feedback. **Communication in Meetings** - Planning and conducting

effective meetings - Group discussions and brainstorming. **Telephone and Virtual Communication** - Professional phone etiquette - Video conferencing tools and etiquette- Mock Interview (Practical)

Module 5: Number System

Basics of Numbers - Natural numbers, whole numbers, integers, and rational numbers - Properties of numbers: Even, odd, prime, composite. **Divisibility Rules** - Tests for divisibility by 2, 3, 4, 5, 6, 8, 9, 10, 11 - Remainder theorem and applications. **LCM and HCF** - Methods to find LCM and HCF - Applications in word problems. **Modular Arithmetic** - Basics of modulus and congruence relations.

Module 6: Arithmetic

Ratio and Proportion - Basic concepts and properties - Direct and inverse proportions. **Percentages** - Calculating percentages and percentage changes - Applications in profit, loss, and discount problems. **Averages** - Weighted averages and combined averages - Problems involving mean, median, and mode. **Simplifications** - Using BODMAS (Brackets, Orders, Division, Multiplication, Addition, Subtraction) - Approximation techniques.

Module 7: Logical Reasoning

Basics of Logical Reasoning - Understanding premises and conclusions - Types of reasoning: Deductive and inductive. **Syllogisms** - Basics of syllogistic reasoning - Venn diagram approach for solving syllogisms. **Statements and Assumptions** - Identifying assumptions in arguments - Strong vs. weak assumptions. **Statements and Conclusions**. Evaluating conclusions based on given statements. **Cause and Effect** - Analyzing relationships between events - Identifying direct and indirect causes.

Module 8: Analytical Reasoning

Puzzles - Seating arrangements (linear and circular) - Scheduling and order-based puzzles. **Blood Relations** - Family tree representation - Solving complex relationship questions. **Direction Sense** - Basics of navigation and direction - Solving problems involving turns and distances. **Coding-Decoding** - Substitution and pattern-based codes - Solving questions on alphanumeric series.

TOTAL : 30 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	**Master Positive Attitudes**: Students will be able to identify and shift negative attitudes, apply strategies to maintain a positive mindset, and recognize the impact of attitude on mental health, relationships, and career growth.	Apply
CO2	**Apply Goal-Setting Techniques**: Students will demonstrate the ability to set and achieve SMART goals in personal, professional, and social contexts, aligning goals with psychological and practical frameworks.	Apply
CO3	**Communicate Effectively in Business**: Students will acquire skills to craft professional business correspondence, deliver impactful presentations, and navigate interpersonal and organizational communication challenges.	Apply
CO4	**Solve Quantitative and Logical Problems**: Students will solve real-world problems using techniques in arithmetic, algebra, and logical reasoning, applying these skills effectively in competitive and professional scenarios.	Apply
CO5	**Exhibit Professionalism in Communication**: Students will confidently engage in professional communication settings, showcasing polished interview techniques, networking skills, and adherence to workplace etiquette.	Apply

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	1	1	1	1	1	-	-	2	2	-	2	1	1
2	2	1	1	1	1	1	-	-	2	2	-	2	1	1
3	2	1	1	1	1	1	-	-	2	2	-	2	1	1
4	2	1	1	1	1	1	-	-	2	2	-	2	1	1
5	2	1	1	1	1	1	-	-	2	2	-	2	1	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:
1. Jeff Keller, Attitude Is Everything: Change Your Attitude, Change Your Life, Collin publishing, 2015
2. Brian Tracy, Goals: How to Get Everything You Want – Faster Than You Ever Thought Possible, Berrett KoehlerPublishing, 2024
3. R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S Chand & company Ltd, 2024
4. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, Gereric Publishing, 2024
REFERENCE BOOKS:
1. Stephen R. Covey, The 7 Habits of Highly Effective People, Simon and Schuster, 2020
2. Dale Carnegie, How to Win Friends and Influence People, Finger print publishing, 2021
WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:
1. https://www.mindtools.com/ 2. https://www.verywellmind.com/ 3. https://hbr.org/ 4. https://www.khanacademy.org/ 5. 5. https://www.grammarly.com/blog/

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SEMESTER – VI

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
11.	PUCS6PC08	Compiler Design	PC	3	1	-	4	4
12.	PUCS6TL09	Embedded Systems And IOT	PC	2	-	2	4	3
13.	PUIT6PEXX	Professional Elective – IV	PE	3	-	-	3	3
14.	PUCC6OE01	Open Elective –I Entrepreneurship Development	OE	3	-	-	3	3
15.		Open Elective – II	OE	3	-	-	3	3
16.	PUIT6SD03	Industry Lecture	SD	-	-	-	1	0
PRACTICAL								
17.	PUCS6PL05	Compiler Design Laboratory	PC	-	-	4	4	2
18.	PUCC6SD04	Professional Development Laboratory-II	PD	-	-	2	2	1
19.	PUIT6SD05	Technical Skill Development-I	SD	-	-	2	2	1
20.		In-plant Training	SD	-	-	-	-	-
		TOTAL		**14**	**1**	**10**	**26**	**20**

- In – Plant Training / Internship - 2 Weeks of Training each during $4^{th}/5^{th}/6^{th}$ Semester – During College hours or semester vacation. It will be reflected on 7^{th} sem grade sheet.
- Any one Open Elective has to be chosen from the management verticals
- Total 4 weeks of Training - 2 Credits

PUCS6PC08	COMPILER DESIGN	L	T	P	C
	(Common to CSE and IT)	3	1	0	4

COURSE OBJECTIVE

- To learn the various phases of compiler.
- To learn the various parsing techniques.
- To understand intermediate code generation and run-time environment.
- To learn to implement code generator.
- To learn to implement code optimization

UNIT - I	INTRODUCTION TO COMPILERS & LEXICAL ANALYSIS	9+3

Introduction- Translators- Compilation and Interpretation- Language processors -The Phases of Compiler – Compiler Construction Tools- Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens – Recognition of Tokens – Finite Automata – Regular Expressions to Automata NFA, DFA – Minimizing DFA– Lex tool.

UNIT - II	SYNTAX ANALYSIS	9+3

Role of Parser – Grammars – Context-free grammars – Writing a grammar Top Down Parsing - General Strategies - Recursive Descent Parser Predictive Parser-LL(1) - Parser-Shift Reduce Parser-LR Parser- LR (0)Item Construction of SLR Parsing Table - Error Handling and Recovery in Syntax Analyzer-YACC tool

UNIT - III	SYNTAX DIRECTED TRANSLATION & INTERMEDIATE CODE GENERATION	9+3

Syntax directed Definitions-Construction of Syntax Tree - Design of predictive translator - Type Systems-Specification of a simple type Checker. Type Conversions. Intermediate Languages: Syntax Tree, Three Address Code, Types and Declarations, Translation of Expressions, Type Checking, Back patching.

UNIT - IV	RUN-TIME ENVIRONMENT AND CODE GENERATION	9+3

Runtime Environments – source language issues – Storage organization – Storage Allocation Strategies: Static, Stack and Heap allocation - Parameter Passing-Symbol Tables - Issues in the Design of a code generator – Basic Blocks and Flow graphs - Design of a simple Code Generator - Optimal Code Generation for Expressions– Dynamic Programming Code Generation

UNIT - V	CODE OPTIMIZATION	9+3

Principal Sources of Optimization – Peep-hole optimization - DAG- Optimization of Basic Blocks - Global Data Flow Analysis - Efficient Data Flow Algorithm – Recent trends in Compiler Design.

TOTAL : 60 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Understand the techniques in different phases of a compiler and learn to use the LEX tool.	Understand
CO2	Understand different parsing algorithms to develop a parser and learn to use YACC tool.	Understand
CO3	Learn to construct the syntax tree and Implement intermediate code generation	Apply
CO4	Implement code generation and learn run-time environment.	Apply
CO5	Analyse code optimization techniques.	Analyze

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	-	-	-	-	2	2	1	3	2	2
2	3	3	3	3	1	-	-	-	2	2	3	2	2	1
3	3	3	2	2	1	-	-	-	2	2	1	1	2	2
4	3	2	2	1	1	-	-	-	2	2	2	3	1	2
5	3	3	3	2	1	-	-	-	2	2	1	3	2	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:
1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers: Principles, Techniques and Tools", Second Edition, Pearson Education, 2009
REFERENCE BOOKS:
1. Randy Allen, Ken Kennedy, Optimizing Compilers for Modern Architectures: A Dependence based Approach, Morgan Kaufmann Publishers, 2002.
2. Steven S. Muchnick, Advanced Compiler Design and Implementation‖, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003
3. Keith D Cooper and Linda Torczon, Engineering a Compiler‖, Morgan Kaufmann Publishers Elsevier Science, 2004.
4. V. Raghavan, Principles of Compiler Design‖, Tata McGraw Hill Education Publishers, 2010
5. Allen I. Holub, Compiler Design in C‖, Prentice-Hall Software Series, 1993
WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:
1. https://online.stanford.edu/courses/soe-ycscs1-compilers 2. https://www.nesoacademy.org/cs/12-compiler-design 3. https://onlinecourses.nptel.ac.in/noc21_cs07/preview

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PUCS6TL09	EMBEDDED SYSTEMS AND IOT	L	T	P	C
	(Common to CSE and IT)	2	0	2	3

COURSE OBJECTIVE

- Gain an understanding of the internal architecture and programming principles of an embedded Processor.
- Explore the interfacing techniques and integration of I/O devices with processors.
- Recognize the evolution and technological advancements of the Internet of Things
- Develop a cost-effective embedded and IoT system using Arduino, Raspberry Pi, or open-Source platforms.
- Implement IoT concepts in real-world applications and analyse their impact.

UNIT - I	FUNDAMENTALS OF 8-BIT EMBEDDED PROCESSOR	6

8-Bit Microcontroller – Architecture – Instruction Set and Programming – Memory Organization - Programming Parallel Ports – Timers and Serial Port – Interrupt Handling.

UNIT - II	EMBEDDED C AND REAL-TIME SYSTEM PROGRAMMING	6

Memory And I/O Devices Interfacing – Communication Protocols Interfacing -Programming Embedded Systems in C – Need For RTOS – Multiple Tasks and Processes –Context Switching – Priority Based Scheduling Policies.

UNIT - III	IOT AND ARDUINO PROGRAMMING	6

Introduction to the Concept of IoT Devices – IoT Devices Versus Computers – IoT Configurations –Basic Components – Introduction to Arduino – Types of Arduino – Arduino Toolchain – Arduino Programming Structure – Sketches – Pins – Input/output From Pins Using Sketches – Introduction to Arduino Shields – Integration of Sensors and Actuators with Arduino

UNIT - IV	IOT COMMUNICATION AND OPEN PLATFORMS	6

IoT Communication Models and APIs – IoT Communication Protocols – Bluetooth – Wi Fi – ZigBee – GPS – GSM modules – Open Platform (like Raspberry Pi) – Architecture –Programming – Interfacing – Accessing GPIO Pins – Sending and Receiving Signals Using GPIO Pins – Connecting to the Cloud.

UNIT - V	REAL-WORLD APPLICATIONS OF EMBEDDED SYSTEMS AND IOT	6

Complete Design of Embedded Systems – Development of IoT Applications – Home Automation – Smart Agriculture – Smart Cities – Smart Healthcare- Smart Manufacturing

TOTAL : 30 PERIODS

PRACTICAL EXERCISES:

1. Write 8051 Assembly Language experiments using simulator.
2. Test data transfer between registers and memory.
3. Perform ALU operations.
4. Write Basic and arithmetic Programs Using Embedded C.
5. Introduction to Arduino platform and programming
6. Explore different communication methods with IoT devices (Zigbee, GSM, Bluetooth)
7. Introduction to Raspberry PI platform and python programming
8. Interfacing sensors with Raspberry PI
9. Communicate between Arduino and Raspberry PI using any wireless medium
10. Setup a cloud platform to log the data
11. Log Data using Raspberry PI and upload to the cloud platform
12. Design an IOT based system

TOTAL :30(Theory)+30(LAB)=60 PERIODS

COURSE OUTCOMES	**On successful completion of this course, the student will be able to:**	**Cognitive Level**
CO1	Describe the architecture and functioning of embedded processors.	Understand
CO2	Develop embedded C programs for microcontroller-based Applications.	Apply
CO3	Construct simple embedded applications using appropriate Hardware and software tools.	Create
CO4	Analyze and differentiate various IoT communication models.	Analyse
CO5	Develop IoT-based applications using Arduino, Raspberry Pi, or other open platforms.	Create

CO - PO MAPPING:														
CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	-	-	-	-	1	2	3	3	2	1
2	2	1	3	2	2	-	-	-	1	2	2	3	3	1
3	3	1	3	3	1	-	-	-	1	2	1	1	1	3
4	2	2	3	2	1	-	-	-	1	2	2	3	2	2
5	3	3	3	2	2	-	-	-	1	3	3	2	3	1
1 - Low, 2 - Medium, 3- High, '-' - No Correlation														

TEXTBOOKS:

1. Muhammed Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, "The 8051Microcontroller and Embedded Systems", Pearson Education, Second Edition, 2014
2. Robert Barton, Patrick Grossetete, David Hanes, Jerome Henry, Gonzalo Salgueiro,"IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for theInternet of Things", CISCO Press, 2017.

REFERENCE BOOKS:

1. Michael J. Pont, "Embedded C", Pearson Education, 2007.
2. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. Introduction to Embedded System Design - Course (nptel.ac.in)
2. Course Link: Embedded Systems - NIT Trichy
3. Course Link: Coursera IoT Specialization, Course Link: edX Embedded Systems,
4. Course Link: Udemy IoT Course
5. SWAYAM Plus (swayam2.ac.in)

PUCC6OE01	ENTREPRENEURSHIP DEVELOPMENT	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- Learn basic concepts in entrepreneurship, develop mind-set and skills necessary to explore entrepreneurship
- Apply process of problem - opportunity identification and validation through human centred approach to design thinking in building solutions as part of engineering projects
- Analyse market types, conduct market estimation, identify customers, create customer persona, develop the skills to
  create a compelling value proposition and build a Minimum Viable Product
- Explore business models, create business plan, conduct financial analysis and feasibility analysis to assess the financial
  viability of a venture ideas & solutions built with domain expertise
- Prepare and present an investible pitch deck of their practice venture to attract stakeholders

UNIT - I	ENTREPRENEURIAL MINDSET	9

Introduction to Entrepreneurship: Definition – Types of Entrepreneurs – Emerging Economics – Developing and Understanding an Entrepreneurial Mind-set – Importance of Technology Entrepreneurship – Benefits to the Society. Case Analysis: Study cases of successful & failed engineering entrepreneurs - Foster Creative Thinking: Engage in a series of Problem-Identification and Problem-Solving tasks

UNIT - II	OPPORTUNITIES	9

Problems and Opportunities – Ideas and Opportunities – Identifying problems in society – Creation of opportunities – Exploring Market Types – Estimating the Market Size, - Knowing the Customer and Consumer - Customer Segmentation - Identifying niche markets – Customer discovery and validation; Market research techniques, tools for validation of ideas and opportunities Activity Session: Identify emerging sectors / potential opportunities in existing markets - Customer Interviews: Conduct preliminary interviews with potential customers for Opportunity Validation - Analyze feedback to refine the opportunity

UNIT - III	PROTOTYPING & ITERATION	9

Prototyping – Importance in entrepreneurial process – Types of Prototypes - Different methods – Tools & Techniques. Hands-on sessions on prototyping tools, Develop a prototype based on identified opportunities; Receive feedback and iterate on the prototypes.

UNIT - IV	BUSINESS MODELS & PITCHING	9

Business Model and Types - Lean Approach - 9 block Lean Canvas Model - Riskiest assumptions to Business Models – Using Business Model Canvas as a Tool – Pitching Techniques: Importance of pitching - Types of pitches - crafting a compelling pitch – pitch presentation skills - using storytelling to gain investor/customer attention. Activity Session: Develop a business model canvas for the prototype; present and receive feedback from peers and mentors - Prepare and practice pitching the business ideas- PPT & Poster Presentation Participate in a Pitching Competition and present to a panel of judges - receive & reflect feedback	
UNIT - V ENTREPRENEURIAL ECOSYSTEM	**9**
Understanding the Entrepreneurial Ecosystem – Components: Angels, Venture Capitalists, Maker Spaces, Incubators, Accelerators, and Investors. Financing models – equity, debt, crowdfunding, etc., Support from the government and corporates. Navigating Ecosystem Support: Searching & Identifying the Right Ecosystem Partner – Leveraging the Ecosystem - Building the right stakeholder network Activity Session: Arrangement of Guest Speaker Sessions by successful entrepreneurs and entrepreneurial ecosystem leaders (incubation managers; angels; etc.), Visit one or two entrepreneurial ecosystem players (Travel and visit a research park or incubator or maker space or interact with start-up founders)- Out Bound Activities	
	TOTAL : 45 PERIODS

COURSE OUTCOMES	**On successful completion of this course, the student will be able to:**	**Cognitive Level**
CO1	Develop an Entrepreneurial Mind-set and Understand the Entrepreneurial Ecosystem Components and Funding types	Understand
CO2	Comprehend the process of opportunity identification through design thinking, identify market potential and customers	Understand
CO3	Create prototypes to materialize design concepts and conduct testing to gather feedback and refine prototypes to build a validated MVP	Create (Not for Examination)
CO4	Analyze and refine business models to ensure sustainability and profitability Prepare and deliver an investible pitch deck of their practice venture to attract stakeholders	Apply
CO5	Understanding the Entrepreneurial Ecosystem	Understand
CO6	Generate and develop creative ideas through ideation techniques	Create (Not for Examination)

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	-	2	1	-	2	-	1	2	2	-	2	1	1
2	2	-	2	1	-	2	-	1	2	2	-	2	1	1
3	2	-	2	1	-	2	-	1	2	2	-	2	1	1
4	2	-	2	1	-	2	-	1	2	2	-	2	1	1
5	2	-	2	1	-	2	-	1	2	2	-	2	2	2

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. Roy R, Indian Entrepreneurship: Theory and Practice. New Delhi: Oxford University Press Osterwalder, A. & Pigneur, Y, 2017.
2. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley & Sons, 2010

REFERENCE BOOKS:

1. Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, Sabyasachi Sinha Entrepreneurship, McGrawHill, 11th Edition, 2020
2. . Ries E,The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. Crown Business, 2019
3. Blank, S. G., & Dorf, B, The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company. K&S Ranch, 2012

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. NPTEL Course: Entrepreneurship Essentials, Prof. Manoj Kumar Mondal, IIT Kharagpur.
2. NPTEL Course: Entrepreneurship, Prof. C. Bhaktavatsala Rao, IIT Madras

PUCS3PL05	COMPILER DESIGN LABORATORY	L	T	P	C
	(Common to CSE and IT)	0	0	4	2

COURSE OBJECTIVE

- To implement the various parsing techniques.
- To implement the front-end of the compiler.
- To generate intermediate code.
- To implement code generator.
- To implement code optimization.

LIST OF EXPERIMENTS

Do the following exercises for any two projects given in the list of sample projects or any other Projects:

1. Using the LEX tool, Develop a lexical analyzer to recognize a few patterns in C. (Ex. identifiers, constants, comments, operators etc.).
2. Create a symbol table, while recognizing identifiers.
3. Implement a Lexical Analyzer using LEX Tool
4. Generate YACC specification for a few syntactic categories. a. Program to recognize a valid arithmetic expression that uses operator +, -, * and /. b. Program to recognize a valid variable which starts with a letter followed by any number of letters or digits. c. Program to recognize a valid control structures syntax of C language (For loop, while loop, if-else, if-else-if, switch-case, etc.). d. Implementation of calculator using LEX and YACC
5. Implement SLR(1) Parsing algorithm.
6. .Design LALR bottom up parser for the given language
7. Generate three address code for a simple program using LEX and YACC.
8. Implement type checking using Lex and Yacc.
9. Implement simple code optimization techniques (Constant folding, Strength reduction and Algebraic transformation)
10. Implement back-end of the compiler for which the three address code is given as input and the 8086 assembly language code is produced as output.

Lab Requirements:

1. Programming Languages/Installation:

- C/C++: Main programming languages for implementing the compiler components.
  - Installation: GCC (GNU Compiler Collection), Clang.
  - Tools: GNU Make for build automation.

2. Compiler Construction Tools:

- Flex: For lexical analysis (scanner).
- Bison: For syntax analysis (parser).
- LLVM: For optimizing and generating machine code.
- ANTLR: For generating parsers based on context-free grammars.

3. Additional Libraries/Packages:

- Graphviz: For generating and displaying parse trees or syntax trees.
- Lex and Yacc/Bison: For parser generation.
- GDB: For debugging and troubleshooting compiler code.

TOTAL : 60 PERIODS

COURSE OUTCOMES	**On successful completion of this course, the student will be able to:**	**Cognitive Level**
CO1	Implement lexical analyzer using LEX tool	Apply
CO2	Develop a parser using different parsing algorithms and learn to use YACC tool.	Apply
CO3	Construct the syntax tree and Implement intermediate code generation	Apply
CO4	Implement code generation	Apply
CO5	Apply code optimization techniques	Apply

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	3	3	3	3	-	-	-	2	2	-	1	2	1
2	2	3	3	3	3	-	-	-	2	2	-	1	2	1
3	2	3	2	2	3	-	-	-	2	2	-	1	2	1
4	2	2	2	1	1	-	-	-	2	2	-	1	2	1
5	2	3	3	2	1	-	-	-	2	2	-	1	2	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers: Principles, Techniques and Tools", Second Edition, Pearson Education, 2023
2. Jean Paul Tremblay, Paul G Serenson, "The Theory and Practice of Compiler Writing", BS Publications, 2005
3. Dhamdhere, D. M., "Compiler Construction Principles and Practice", 2nd edition, Macmillan India Ltd., New Delhi, 2008

REFERENCE BOOKS:

1. Randy Allen, Ken Kennedy, Optimizing Compilers for Modern Architectures: A Dependence based Approach, Morgan Kaufmann Publishers, 2002
2. Steven S. Muchnick, Advanced Compiler Design and Implementation‖, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003.
3. Keith D Cooper and Linda Torczon, Engineering a Compiler‖, Morgan Kaufmann Publishers Elsevier Science, 2004.
4. V. Raghavan, Principles of Compiler Design‖, Tata McGraw Hill Education Publishers, 2010.
5. Allen I. Holub, Compiler Design in C‖, Prentice-Hall Software Series, 1993

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://online.stanford.edu/courses/soe-ycscs1-compilers
2. https://www.nesoacademy.org/cs/12-compiler-design
3. https://onlinecourses.nptel.ac.in/noc21_cs07/preview
4. http://javapoint.com/compiler-tutorial

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PUCC6SD04	PROFESSIONAL DEVELOPMENT - II	L	T	P	C
		0	0	2	1

COURSE OBJECTIVE

- **Enhance Communication Proficiency**: To build expertise in non-verbal, interpersonal, and organizational communication, ensuring clarity and impact in various professional settings.
- **Strengthen Quantitative and Analytical Reasoning**: To develop problem-solving skills in geometry, data interpretation, probability, and reasoning to tackle numerical and logical challenges efficiently.
- **Leverage Technology and Emerging Trends**: To integrate business communication tools and emerging technologies, including AI and social media, into professional practices Introduce techniques for broadcast and multicast

SYLLABUS

Module 1: Non-Verbal Communication

Body Language - Importance of gestures, posture, and facial expressions - Maintaining eye contact and appropriate handshakes. **Visual Communication** - Use of charts, graphs, and presentations- Mind Mapping - Designing effective visual aids. **Team Communication** - Collaboration and teamwork. - Communicating in diverse and cross-functional teams.

Module 2: Social Media & Professional Communication

Using LinkedIn, Twitter, and blogs for professional communication - Guidelines for professional digital conduct. **Emerging Trends** – Generative AI in communication: Chatbots, automated emails - Data visualization tools for reporting- MS Office

Module 3: Time, Speed, and Distance

Basic Concepts - Relationships between speed, time, and distance - Conversions and applications. **Relative Speed** - Problems involving trains, boats, and streams. **Circular Motion** - Solving problems on circular tracks and relative motion.

Module 4: Geometry

Basic Geometry - Properties of lines, angles, triangles, quadrilaterals, and circles. **Mensuration** - Area, perimeter, and volume of 2D and 3D shapes - Applications in surface area and real-life problems. **Coordinate Geometry** - Distance between points, mid-point, and equation of a line.

Module 5: Data Interpretation

Data Representation - Reading and interpreting bar charts, pie charts, line graphs, and tables. **Data Analysis** - Solving problems on growth rate, percentage changes, and averages. **Case lets** - Analyzing data-intensive word problems.

Module 6: Probability and Statistics

Basics of Probability - Theoretical probability and its applications. - Simple and compound events. **Permutations and Combinations** - Counting principles - Solving arrangements and selection problems. **Descriptive Statistics** - Mean, median, mode, variance, and standard deviation. **Module 7: Non-Verbal Reasoning** **Pattern Recognition** - Identifying similarities and differences in figures. **Series Completion** - Completing figure series based on patterns. **Mirror and Water Images** - Solving problems on reflection-based figures. **Paper Folding and Cutting** - Visualizing shapes after folding or cutting. **Module 8: Logical Puzzles** **Clocks and Calendars** - Time-based problems and angle calculations - Calendar-based puzzles, including leap years. **Cubes and Dice** - Visualizing unfolded dice and cube structures - Solving problems based on colors and numbers. **Logical Sequences** - Finding missing elements in a logical sequence. Solving progressive and regressive series
TOTAL : 30 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	**Exhibit Advanced Communication Skills**: Graduates will use body language, visual aids, PPT, AI Tools and digital platforms effectively, while navigating interpersonal and organizational communication challenges with confidence	Apply
CO2	**Apply Quantitative and Logical Solutions**: Learners will solve complex problems in areas like time, speed, geometry, and data analysis, showcasing their quantitative and logical reasoning abilities	Apply
CO3	**Integrate Technology in Communication**: Students will proficiently use tools like Slack, Trello, and AI-driven communication technologies to streamline collaboration, reporting, and professional networking	Create

CO - PO MAPPING:														
CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	1	1	1	1	1	-	-	3	3	-	2	2	1
2	2	1	1	1	1	1	-	-	3	3	-	2	2	1
3	2	1	1	1	1	1	-	-	3	3	-	2	2	1
1 - Low, 2 - Medium, 3- High, '-' - No Correlation														

TEXTBOOKS:

1. R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S Chand publishing, 2020
2. James Clear, Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones, Penguin, 2018
3. Allan Pease, Body Language: How to Read Others' Thoughts by Their Gestures, Manjul publishing, 2004
4. Travis Bradberry and Jean Greaves, Emotional Intelligence 2.0, Touchstone, 2009.

REFERENCE BOOKS:

1. Stephen R. Covey, The 7 Habits of Highly Effective People, Simon Schuster, 2020
2. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, 2023

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://www.mindtools.com/
2. https://www.verywellmind.com/
3. https://hbr.org/
4. https://www.coursera.org/learn/learning-how-to-learn
5. 5. https://www.edx.org/course/communication-skills-for-workplace-success
6. Developing Soft Skills and Personality (NPTEL)
7. https://onlinecourses.nptel.ac.in/noc24_hs176/preview
8. Leadership and Team Effectiveness (NPTEL)
9. https://archive.nptel.ac.in/courses/110/107/110107159/
10. Effective Business Communication (Swayam)
11. https://onlinecourses.swayam2.ac.in/imb19_mg14/preview
12. Quantitative Methods for Business (Swayam)

SEMESTER – VII

S.NO.	COURSE CODE	COURSE NAME	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	PUCS7PC09	Cryptography and Cyber Security	PC	3	1	-	4	4
2	PUIT7PC07	Mobile Application and Development	PC	3	-	-	3	3
3	PUIT7PEXX	Professional Elective – V	PE	3	-	-	3	3
4	PUIT7PEXX	Professional Elective – VI	PE	3	-	-	3	3
5		Open Elective – III	OE	3	-	-	3	3
6		Open Elective – IV	OE	3	-	-	3	3
PRACTICAL								
7	PUIT7PL07	Mobile Application Development Laboratory	PC	-	-	4	4	2
8	PUCS7PL07	Security Laboratory	PC	-	-	4	4	2
9	PUIT7SD06	Technical Skill Development-II	SD	-	-	2	2	1
10	PUIT7PR01	Project Phase – I	Project	-	-	2	2	1
11	PUIT7SD07	In-plant Training	SD	-	-	-	-	2
		TOTAL		**18**	**1**	**12**	**31**	**27**

PUCS7PC10	CRYPTOGRAPHY AND CYBER SECURITY	L	T	P	C
	(Common to CSE and IT)	3	1	0	4

COURSE OBJECTIVE

- Learn to analyse the security of in-built cryptosystems.
- Know the fundamental mathematical concepts related to security.
- Develop cryptographic algorithms for information security.
- Comprehend the various types of data integrity and authentication schemes
- Understand cybercrimes and cyber security.

UNIT - I	BASICS OF CRYPTOGRAPHY	9+3

Introduction to Computer Security - Overview of the OSI Security Architecture - Types of Security Attacks, Security Services, and Mechanisms - A Comprehensive Model for Network Security - Classical Encryption Techniques: Substitution techniques, Transposition techniques, Steganography - Foundations of Modern Cryptography - Perfect security – Information Theory -Legal, Ethical and Professional Issues.

UNIT - II	MATHEMATICAL FOUNDATIONS AND SYMMETRIC KEY CRYPTOGRAPHY	9+3

Number Theory and Algebraic Structures-Modular Arithmetic-Euclid's Algorithm-Congruence and Matrices-Groups, Rings, and Fields-Finite Fields- SYMMETRIC KEY CIPHERS-Simplified DES (SDES)-Block Ciphers: DES, Strength of DES, and Cryptanalysis Techniques (Differential and Linear)-Block Cipher Design Principles and Modes of Operation-Evaluation Criteria for Advanced Encryption Standard (AES)-Pseudorandom Number Generators-Stream Cipher: RC4-Key Distribution Mechanisms.

UNIT - III	ASYMMETRIC KEY CRYPTOGRAPHY	9+3

Prime Numbers and Factorization-Properties of Prime Numbers-Primality Testing Methods-Factorization Algorithms-Mathematical Theorems and Functions: Euler's Totient Function-Fermat's Little Theorem-Euler's Theorem-Chinese Remainder Theorem-Exponentiation and Logarithms: Modular Exponentiation-Logarithmic Functions in Cryptography-Asymmetric Key Cryptography: RSA Cryptosystem: Key Generation, Encryption, and Decryption-Key Distribution and Key Management Techniques-Diffie-Hellman Key Exchange Protocol-Elliptic Curve Cryptography (ECC):Elliptic Curve Arithmetic-Elliptic Curve Cryptography for Efficient Public Key Systems

UNIT - IV	PUBLIC KEY CRYPTOGRAPHY & SECURITY PROTOCOLS	9+3

Authentication Requirements and Functions: Overview of Authentication Functions-Message Authentication Code (MAC)-Hash Functions and Their Security- Secure Hash Functions:HMAC (Hashed Message Authentication Code)-CMAC (Cipher-based Message Authentication Code)-SHA (Secure Hash Algorithm)-Digital Signatures and Authentication Protocols: Digital Signature Concepts-Authentication Protocols Using Digital Signatures-Digital Signature Standard (DSS)-Schnorr Digital Signature Scheme-ElGamal Cryptosystem-Entity Authentication: Biometrics and Password-Based Authentication-Challenge-Response Protocols-Authentication Applications:Kerberos Authentication System-Mutual Trust and Key Management:Key Management and Distribution Mechanisms-Symmetric and Asymmetric Key Distribution-Public Key Distribution and Management-X.509 Certificates and Their Role in Trust.

UNIT - V	**INTRODUCTION TO CYBER SECURITY**	**9+3**
Cyber Crime and Information Security – classifications of Cyber Crimes – Tools and Methods – Password Cracking, Introduction to Traditional Computer Crime-Traditional problems associated with Computer Crime-Introduction to Identity Theft & Identity Fraud- Types of CF techniques - Incident and incident response Methodology-Wire shark tool-Crypt tool.		
		TOTAL : 60 PERIODS

COURSE OUTCOMES	**On successful completion of this course, the student will be able to:**	**Cognitive Level**
CO1	Explore various network security systems and techniques.	Understand
CO2	Apply mathematical principles to implement symmetric key cryptography	Apply
CO3	Apply mathematical concepts in asymmetric key cryptography	Apply
CO4	Analyze authentication algorithms	Analyze
CO5	Examine the concepts of cybercrime and cyber security	Apply

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	2	2	1	–	–	1	–	–	–	1	2	1
2	3	3	3	2	1	–	–	1	–	–	–	1	2	1
3	3	3	3	2	1	–	–	1	–	–	–	1	2	1
4	3	3	2	2	1	–	–	1	–	–	–	1	2	1
5	3	3	2	2	1	–	–	1	–	–	2	1	2	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. William Stallings' "Cryptography and Network Security: Principles and Practice" is the **8th Edition**, published by Pearson in 2020.

REFERENCE BOOKS:

1. Behrouz A. Ferouzan, Debdeep Mukhopadhyay, "Cryptography and Network Security", 3rd Edition, Tata Mc Graw Hill, 2015
2. Charles Pfleeger, Shari Pfleeger, Jonathan Margulies, "Security in Computing", Fifth Edition, Prentice Hall, New Delhi, 2015
3. MarjieT.Britz, —Computer Forensics and Cyber Crime‖: An Introduction‖, 3rd Edition, Prentice Hall, 2013.
4. Nina Godbole, Sunit Belapure, "Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives", First Edition, Wiley India, 2011

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://onlinecourses.nptel.ac.in/noc25_cs16/preview
2. https://www.tutorialspoint.com/cryptography
3. https://www.coursera.org/courses/cryptography

PUIT7PC07	MOBILE APPLICATION AND DEVELOPMENT	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE

- To Understand the Fundamentals of Mobile Applications
- To Gain basic understanding of Android application development
- To Apply UI/UX Design Principles to develop mobile applications frameworks
- To demonstrate knowledge of fundamental UI components and their properties in Android application development.
- To Develop skills in using Android networking APIs to connect applications to the internet

UNIT - I	INTRODUCTION TO MOBILE APPLICATION DEVELOPMENT	9

Mobile Application Development - Mobile Applications and Device Platforms -Comparing Native vs. Hybrid Applications-The Mobile Application Development Lifecycle-The Mobile Application Front-End-The Mobile Application Back-End-Key Mobile Application Services. Mobile Device Operating Systems -Special Constraints & Requirements — Commercial Mobile Operating Systems

UNIT - II	INTRODUCTION TO ANDROID	9

Introduction to Android: The Android Platform, Android Development Tools, Building Your First Android Application, Anatomy of an Android Application, Understanding the Android Manifest File.

UNIT - III	UI COMPONENTS AND DATA MANAGEMENT	9

Using Basic Views, Using Picker Views, Using List Views to Display Long Lists, Using Image Views to Display Pictures, Using Menus with Views, Saving and Loading User Preferences, Persisting Data to Files, Creating and Using Databases.

UNIT - IV	USER INTERFACE DESIGN & MULTIMEDIA	9

User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Playing and recording media, Using the Camera to Take and Process Pictures.

UNIT - V	ANDROID APIs	9

Using Android Data and Storage APIs, Managing Data with SQLite, Sharing Data Between Applications, Networking in Android, Integrating Web APIs, Deploying Android Applications.

TOTAL : 45 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Explain the basic concepts of mobile application development, User-interface design, basics of graphics and multimedia.	Understand
CO2	Comprehend the development of android applications and also gain knowledge.	Understand
CO3	Apply the design principles of user Interface for developing mobile application frameworks	Apply
CO4	Enhance advanced skills and proficiency in Android Studio development.	Create
CO5	Analyse mobile application designs to identify issues and areas for improvement.	Analyze

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2	-	1	2	-	-	-	1	1	2	1	2	3
2	3	3	2	2	2	2	-	-	2	2	1	2	2	2
3	3	3	3	3	2	1	-	-	3	2	2	2	3	3
4	3	2	2	2	2	3	-	-	2	1	2	2	2	2
5	3	3	3	3	3	3	-	-	3	2	2	3	3	3

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
2. Jerome DiMarzio, "Beginning Android Programming with Android Studio", 4thEdition.(2016)

REFERENCE BOOKS:

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017.
2. Dawn Griffiths, David Griffiths, "Head First Android Development: A Brain-Friendly Guide", 2017.
3. Dawn Griffiths and David Griffiths, "Head First Android Development", 1st Edition, O"Reilly SPD Publishers, 2015. ISBN-13: 978-9352131341

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://www.javatpoint.com/android-tutorial
2. https://archive.nptel.ac.in/courses/106/106/106106156/
3. https://aws.amazon.com/mobile/mobile-application-development/
4. https://www.coursera.org/learn/introduction-to-android-mobile-application-development
5. https://www.tutorialspoint.com/mobile_development_tutorials.html

PUIT7PL07	MOBILE APPLICATION DEVELOPMENT LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVE

- Equip students with fundamental mobile app development concepts.
- Enable the design and implementation of user-friendly interfaces.
- Teach integration of data from external sources like RESTful APIs.
- Provide hands-on experience with Android Studio.
- Educate on secure mobile apps with authentication and data management.

LIST OF EXPERIMENTS

1. Create a simple "Hello, World!" mobile application.
2. Develop a mobile app with a user-friendly interface, including basic UI components like buttons, text fields, and images.
3. Create a mobile app that retrieves and displays data from a RESTful API.
4. Design and implement a mobile app with a custom layout using Constraint Layout and other advanced UI elements.
5. Build a simple calculator app using Android Studio, including activities and intent handling.
6. Create an app that plays audio and video files, demonstrating multimedia handling in Android.
7. Implement a mobile app that includes location-based services (GPS).
8. Develop an app that saves user data using SQLite database.
9. Create a chat application using Firebase for real-time data synchronization.
10. Develop an app with user authentication and secure data storage.

Lab Requirements:

- Android
- Flutter
- Kotline
- Dart

TOTAL : 60 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Implement basic mobile app principles.	Apply
CO2	Develop user-friendly interfaces with basic UI components.	Create
CO3	Create apps that display data from RESTful APIs.	Apply
CO4	Gain proficiency in Android Studio by building functional apps.	Apply
CO5	Implement secure apps with features like authentication and data storage.	Create

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	2	2	-	2	-	-	-	2	1	-	1	2	2
2	3	3	3	2	3	-	-	-	3	2	-	2	3	3
3	3	3	3	3	3	-	-	-	3	2	-	2	3	3
4	3	2	2	2	2	-	-	-	2	1	-	2	2	2
5	3	3	3	3	3	-	-	-	3	2	-	3	3	3

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
2. Jerome DiMarzio, "Beginning Android Programming with Android Studio", 4thEdition.(2016)

REFERENCE BOOKS:

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017.
2. Dawn Griffiths, David Griffiths, "Head First Android Development: A Brain-Friendly Guide", 2017.

3. Dawn Griffiths and David Griffiths, "Head First Android Development", 1st Edition, O"Reilly SPD Publishers, 2015. ISBN-13: 978-9352131341.

WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:

1. https://www.javatpoint.com/android-tutorial
2. https://archive.nptel.ac.in/courses/106/106/106106156/
3. https://aws.amazon.com/mobile/mobile-application-development/
4. https://www.coursera.org/learn/introduction-to-android-mobile-application-development
5. https://www.tutorialspoint.com/mobile_development_tutorials.html

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PUCS7PL07	SECURITY LABORATORY	L	T	P	C
	(Common to CSE and IT)	0	0	4	2

COURSE OBJECTIVE

- To gain an understanding of various cipher techniques used in cryptography for securing data.
- To Implement and explore cryptographic algorithms such as DES, RSA and SHA-1 to understand their workings and applications.
- To Explore and Configure Network Security monitoring Tools

LIST OF EXPERIMENTS

1. Examine the encryption, decryption using the following substitution techniques
   (i)Cease cipher,
   (ii)Play fair cipher
   (iii)Hill Cipher
   (iv)Vigenere cipher
2. Apply the encryption and decryption using following transposition techniques
   i)Rail fence
   ii)Row&ColumnTransformation.
3. Implement the DES algorithm in practical use scenarios to understand its practical applications.
4. Utilize the AES algorithm in practical use cases to explore its effectiveness in encryption.
5. Implementation of RC4.
6. Implement RSA Algorithm.
7. Implementation of Elliptic Curve cryptography.
8. Implement the Diffie-Hellman Key Exchange algorithm for a given problem.
9. Generate the message digest for a given text using the SHA-1 algorithm to ensure data integrity.
10. Explore network Security monitoring tools Wireshark or firewalls.

Lab Requirements:

- Windows or Mac OS or Unix
- JAVA

• PYTHON • WIRESHARK
TOTAL : 60 PERIODS

COURSE OUTCOMES	On successful completion of this course, the student will be able to:	Cognitive Level
CO1	Explore the classical Encryption Techniques by develop the code for to solve a problems	Understand
CO2	Build the cryptosystems by applying symmetric and public key encryption algorithms.	Apply
CO3	Ensure data integrity and verify the authenticity of digital information.	Apply
CO4	Analyze the various authentication algorithms to enhance security in communication systems.	Analyze
CO5	Demonstrate the Network Security monitoring Tools	Create

CO - PO MAPPING:

CO's	PO's												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	2	2	1	–	–	1	-	-	–	1	2	1
2	3	3	3	2	1	–	–	1	-	-	–	1	2	1
3	3	3	3	2	1	–	–	1	-	-	–	1	2	1
4	3	3	2	2	1	–	–	1	-	-	2	1	2	1
5	3	3	2	2	2	–	–	1	-	-	–	1	2	1

1 - Low, 2 - Medium, 3- High, '-' - No Correlation

TEXTBOOKS:
1. William Stallings, "Cryptography and Network Security – Principles and Practice", Eight Edition, Pearson Education, 2020
2. Nina Godbole, Sunit Belapure, "Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives", First Edition, Wiley India, 2011
REFERENCE BOOKS:
1. Behrouz A. Ferouzan, Debdeep Mukhopadhyay, "Cryptography and Network Security", 3rd Edition, Tata Mc Graw Hill, 2015
2. Charles Pfleeger, Shari Pfleeger, Jonathan Margulies, "Security in Computing", Fifth Edition, Prentice Hall, New Delhi, 2015.
3. MarjieT.Britz, —Computer Forensics and Cyber Crimeǁ: An Introductionǁ, 3rd Edition, Prentice Hall, 2013.
WEBSITE REFERENCE / NPTEL / SWAYAM / MOOC REFERENCE:
1. https://onlinecourses.nptel.ac.in/noc25_cs16/preview

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