



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. INFORMATION TECHNOLOGY – SYLLABUS (Under CBCS based on OBE)(with effect from 2021 – 2022)

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UNDERGRADUATE(UG)PROGRAMMEOUTCOMES(POs)

Undergraduate (B.A., B.Sc., B.Com., B.C.A., B.B.A., etc.) is a 3–year degree programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO 1	Critical Thinking: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	Problem Solving: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	Effective Communication: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	Societal/ Citizenship/ Ethical Credibility: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO 5	Environmental Concern and Sustainable Growth: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	Skill Development and Employable Abilities: Adequate training in relevant skill sector and creating employable abilities among the under graduates.



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PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **Bachelor of Information Technology (B.Sc. I.T) Programme**, the students are expected to

PSO 1	Develop professionally competent citizens by applying the scientific knowledge of Computer Science with the ability to think clearly, rationally and creatively to support in evolving solutions to the social/public/scientific issues with responsible democratic participation
PSO 2	Enterprising resourcefulness to identify, plan, formulate, design and evaluate solutions for complex computing problems that address the specific needs with appropriate consideration for Societal, Cultural, Environmental and Industrial domains.
PSO 3	Holistic development to ignite the lateral thinking ability in problem solving, acquisition of new skills, open-minded and organized way of facing problems with self awareness and evolving analytical solutions
PSO 4	Create and initiate innovations effectively and communicate efficiently with the computing community and society at large to bridge the gap between computing industry and academia
PSO 5	Through Digital Literacy, understand, assess and commit to professional and ethical principles, norms and responsibilities of the cyber world and the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders
PSO 6	Ability and willingness to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills.



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B.Sc. INFORMATION TECHNOLOGY – COURSE STRUCTURE

SEMESTER – I

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT11	Part – I: Tamil – கவிதையும் சிறுகதையும்	6	3	25	75	100	3
	21UACH11	Hindi – Hindi – I						
	21UACS11	Sanskrit – Sanskrit – I						
2.	21UACE11	Part – II: English – English For Enrichment – I	6	3	25	75	100	3
3.	21UITC11	Part – III: Core – 1: Programming in C	5	3	25	75	100	4
4.	21UITCP1	Part – III: Core – 2: Programming in C Lab	5	3	40	60	100	4
5.	21UITA11	Part – III: Allied – 1: Discrete Structures	4	3	25	75	100	4
6.	21UITS11	Part – IV: SBS – 1: Digital Computer Fundamentals	2	3	25	75	100	2
7.	21UACVE1	Part – IV: Value Education	2	3	25	75	100	2
TOTAL			30				700	22

SEMESTER – II

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT21	Part – I: Tamil – செய்யுளும் புதினமும்	6	3	25	75	100	3
	21UACH21	Hindi – Hindi – II						
	21UACS21	Sanskrit – Sanskrit – II						
2.	21UACE21	Part – II: English – English For Enrichment – II	6	3	25	75	100	3
3.	21UITC21	Part – III: Core – 3: Fundamentals of Data Structure	5	3	25	75	100	4
4.	21UITCP2	Part – III: Core – 4: Data Structure Using C Lab	5	3	40	60	100	4
5.	21UITA21	Part – III: Allied – 2: Statistics	4	3	25	75	100	4
6.	21UITS21	Part – IV: SBS – 2: Computer Organization and Architecture	2	3	25	75	100	2
7.	21UACES1	Part – IV: Environmental Studies	2	3	25	75	100	2
TOTAL			30				700	22



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SEMESTER – III

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT31	Part – I: Tamil – காப்பியமும் நாடகமும்	6	3	25	75	100	3
	21UACH31	Hindi – Hindi – III						
	21UACS31	Sanskrit – Sanskrit – III						
2.	21UACE31	Part – II: English – English For Enrichment – III	6	3	25	75	100	3
3.	21UITC31	Part – III: Core – 5: Object Oriented Programming Using C++	5	3	25	75	100	4
4.	21UITCP3	Part – III: Core – 6: Lab: Object Oriented Programming Using C++	5	3	40	60	100	4
5.	21UITA31	Part – III: Allied – 3: Operations Research	4	3	25	75	100	4
6.	21UITSP1	Part – IV: SBS – 3: Lab: Office Automation	2	3	40	60	100	2
7.	21UITN31	Part – IV: NME – 1: Introduction to Information System	2	3	25	75	100	2
TOTAL			30				700	22

SEMESTER – IV

S. No	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT41	Part – I: Tamil – சங்க இலக்கியமும் அற இலக்கியமும்	6	3	25	75	100	3
	21UACH41	Hindi – Hindi – IV						
	21UACS41	Sanskrit – Sanskrit – IV						
2.	21UACE41	Part – II: English – English For Enrichment – IV	6	3	25	75	100	3
3.	21UITC41	Part – III: Core – 7: Programming in Java	5	3	25	75	100	4
4.	21UITCP4	Part – III: Core – 8: Lab: Java Programming	5	3	40	60	100	4
5.	21UITA41	Part – III: Allied – 4: Numerical Methods	4	3	25	75	100	4
6.	21UITSP2	Part – IV: SBS – 4: Lab: Multimedia	2	3	40	60	100	2
7.	21UITN41	Part – IV: NME – 2: Introduction to MS–Office	2	3	25	75	100	2
8.		Part – V: Extension Activities	–	–	–	–	100	1
TOTAL			30				800	23



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SEMESTER – V

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UITC51	Part – III: Core – 9: Operating System Concepts	6	3	25	75	100	4
2.	21UITC52	Part – III: Core – 10: TCP/IP	5	3	25	75	100	4
3.	21UITC53	Part – III: Core – 11: Python Programming	5	3	25	75	100	4
4.	21UITCP5	Part – III: Core – 12: Lab: Python Programming	5	3	40	60	100	4
5.	Part – III: Elective – 1:		5	3	25	75	100	5
	21UITE51	Mobile Computing						
	21UITE52	Big Data Fundamental						
	21UITE53	BioMetrics						
6.	21UITSP3	Part – IV: SBS – 5: Lab: VB Dot Net	2	3	40	60	100	2
7.	21UITSP4	Part – IV: SBS – 6: Lab: OS (Linux)	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self–Study)	–	–	–	–	100	–
TOTAL			30				800	25

*One elective course to be chosen from THREE courses

SEMESTER – VI

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UITC61	Part – III: Core – 13: Software Engineering	5	3	25	75	100	4
2.	21UITC62	Part – III: Core –14: Relational Database Management System	5	3	25	75	100	4
3.	21UITCP6	Part – III: Core – 15: Lab : Oracle	5	3	40	60	100	4
4.	21UITCP7	Part – III: Core – 16: Lab : HTML &PHP	5	3	40	60	100	4
5.	Part – III: Elective – 2:		5	3	25	75	100	5
	21UITE61	Principles of Information Security						
	21UITE62	Software Testing						
	21UITE63	Ethical Hacking						
6.	21UITEV1	Part – III : Elective–3: Project and Viva Voce	5	3	40	60	100	5
7.	21UGKY61	General Knowledge (Self–Study)	–	–	–	–	100	–
TOTAL			30				700	26

*One elective course to be chosen from THREE courses



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COURSE STRUCTURE – V SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UITC51	Part – III: Core – 9: Operating System Concepts	6	3	25	75	100	4
2.	21UITC52	Part – III: Core – 10: TCP/IP	5	3	25	75	100	4
3.	21UITC53	Part – III: Core – 11: Python Programming	5	3	25	75	100	4
4.	21UITCP5	Part – III: Core – 12: Lab: Python Programming	5	3	40	60	100	4
5.	Part – III: Elective – 1:		5	3	25	75	100	5
	21UITE51	Mobile Computing						
	21UITE52	Big Data Fundamental						
	21UITE53	BioMetrics						
6.	21UITSP3	Part – IV: SBS – 5: Lab: VB Dot Net	2	3	40	60	100	2
7.	21UITSP4	Part – IV: SBS – 6: Lab: OS (Linux)	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self-Study)	–	–	–	–	100	–
		TOTAL	30				800	25

*One elective course to be chosen from THREE courses

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

T – Theory

P – Practical



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITC51	OPERATING SYSTEM	CORE-9	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to provide fundamental concepts of operating system for the system which enhances the user to access the computer and software installation.

COURSE OBJECTIVES:

- To gain knowledge about types Operating System, Scheduling
- To enrich the knowledge about Process, Memory Management and Deadlock.
- To understand about Storage and File Management.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Fundamental concepts of Operating System	Upto K3
CO 2	apply the basic concepts of process management, scheduling algorithm and multithreading models.	Upto K3
CO 3	analyze the synchronization and Deadlock process.	Upto K3
CO 4	explain the purpose of storage management with page segmentation, allocation of frames and Thrashing	Upto K3
CO 5	discuss the Files allocation methods and Implementation and swap management	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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OPERATING SYSTEM CONCEPTS

UNIT-I: Introduction

Definition–Simple Batch System, Multiprogrammed – Time Sharing –Distributed System – **Computer System Structure** : Hardware Protection (Dual Mode Operation, I/O Protection, Memory Protection , CPU Protection – **Operating System Structure:** System Components – Operating system services, System calls, System programs.

UNIT-II: Process Management

Process concepts, scheduling, operations – cooperating processes(Creation and Termination) – Interprocess communication (Message Passing System, Naming, Synchronization, Buffering) – **Threads** : Multithreading models and issues.

UNIT-III: CPU Scheduling and Deadlock

Scheduling Basic Concept – Scheduling Criteria – Scheduling Algorithms (FCFS ,SJF,RR) –Multilevel Queue Scheduling – Algorithm Evaluation (Deterministic, Queuing, Simulations)–Deadlock Characterization, Prevention, Avoidance and Detection– Recovery from deadlock

UNIT-IV: Storage Management

Memory Management: Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging – Demand paging – Process creation – Page replacement – Thrashing

UNIT-V: File-System and Disk Scheduling

File Concepts – Access methods – Allocation method – Directory Structure (Single Level, Two Level, Tree Structured) – **File System Implementation:** – Allocation Methods (Contiguous Allocation, Linked Allocation, Indexed Allocation) – Disk Management – Swap Space Management.



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TEXT BOOK:

Sliberschartz A. Galvin P.B. Gange F., *Operating System Concepts* – 6th Edition 2012, John Wiley and Sons.

CHAPTERS and SECTIONS (For UNITS–I, II, III, IV and V)

Unit – I: Chapter 3: Page No: 63–94, Chapter 4: Page No: 97–134

Unit – II: Chapter 5: Page No: 148–187, Chapter 6: Page No: 193–218,
Chapter 7: Page No: 220–253, Chapter 8: Page No: 288–297

Unit – III: Chapter 9: Page No: 303–333, Chapter 10: Page No: 338–374

Unit – IV: Chapter 10: Page No: 378–379, Chapter 11: Page No: 384–422,
Chapter 12: Page No: 438–451

Chapter 16: Page No: 592–630, Chapter 17: Page No: 648–662,

Unit – V: Chapter 18: Page No: 676–721, Chapter 19: Page No: 726–739,

Chapter 20: Page No: 747–752

REFERENCE BOOKS:

1. Maurice J. Bach. *Design of Unix Operating System*, Prentice Hall of India NewDelhi–2002
2. Davis. *Operating System* Pearson education 6th edition

DIGITAL TOOLS:

1. <http://www.ics.uci.edu/~ics143/lectures.html>
2. <http://www.studytonight.com/operating-system>
3. <https://www.guru99.com/os-tutorial.html>
4. <https://www.javatpoint.com/os-tutorial>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2		2	1			3
CO3	3					2
CO4		2	2	1	2	
CO5		2	1		1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITC52	TCP/IP	CORE-10	5	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

To understand the basic concept of networking and analyze various switching techniques. To get the knowledge of Transport Layer Services, TCP Services, Client Server Paradigm and Discuss FTP and web Documents.

COURSE OBJECTIVES:

To make the students

- understand about Basic of Networks
- understand about the Classes of IP Address
- understand about DNS and DHCP

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand about the basics concepts of Networking like devices, topology and networking	Upto K3
CO 2	analyze various switching techniques, Networking Sources, and Apply in IPV4 Addressing	Upto K3
CO 3	know Transport Layer Services, TCP Services, Client Server Paradigm	Upto K3
CO 4	analyse DHCP operation and DNS	Upto K3
CO 5	discuss FTP and Web Documents	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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TCP/IP

UNIT– I: Basics of Networks

Definition – Need for Network – Types of Network : LAN,WAN,MAN – Types of Topology: Bus, Star, Ring – Transmission Media : Coaxial Cables , Twisted Pair Wire , Optic Fibre – Transmission Mode : Duplex , Full Duplex , Half Duplex, Modern–Connecting Devices : Hub , Switches , NIC, Repeater, Bridges , Gateway.

UNIT– II: Network Layer

OSI Model: Layered Architecture – OSI Model – Layers in TCP/IP Protocol Suite. Switching: Circuit and Packet Switching – Connection Less and Connection Oriented Services –Ipv4 Address: Introduction – Classful and Classless addressing.

UNIT– III: TCP

Transport Layer Services: Process to Process, Addressing, Encapsulation and Decapsulation, Multiplexing and Demultiplexing, Flowcontrol, Connection and Connection less Protocols –Simple, Stop & Wait ,Go–Back N – TCP Services – TCP Connection : Error Control, Checksum, Acknowledgement, Retransmission. Client Server Paradigm: Client, Server , Concurrency, Socket Interface.

UNIT– IV: DHCP and DNS

Introduction – DHCP Operation – Configuration– DNS: Need for DNS – Namespace – DNS in the Internet– DNS Msg – Types of Record.

UNIT– V: FTP and WWW

FTP: Connections, Communication, Command processing, File Transfer – WWW Architecture : Hypertext and Hypermedia, Web client, Web server, Uniform Resources Locator (URL) – Web Documents: Static Documents, Dynamic Documents, Active Documents– Electronic mail : Architecture , User Agent , SMTP Commands & Responses, Mail Transfer Phases.

TEXT BOOK:

TCP/IP Protocol Suite 4th Edition – Behrouz A.Forouzan TATA McGrawHill Edition
CHAPTERS and CHAPTERS and SECTIONS (For UNIT–I, II, III,IV and V)

Unit – I: Page 20 – 30,

Unit – II: Page 95 – 107, 115 – 142

Unit – III: Page 375–379,386,390,391,395,465,466,543–546

Unit – IV: Page 569 – 579, 582–592, 598,599,

Unit – V: Page 630 –639, 657–659,660–663,681–686,687–691



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REFERENCE BOOKS:

1. Andrew S. Tanenbaum, *Computer Networks*, 4th Edition, Pearson Education,
2. E.Douglas Comer, David L. Stevens, *Internetworking with TCP/IP* – Volume - I, II and III

DIGITAL TOOLS:

1. <http://www.studytonight.com/computer-networks>
2. <http://www.techiwarehouse.com/engine/d9e99072/Basic-Networking-Tutorial>
3. <https://www.guru99.com/tcp-ip-model.html>
4. <https://www.simplilearn.com/tutorials/cyber-security-tutorial/what-is-tcp-ip-model>
5. http://xahlee.info/linux/tcp_ip_tutorial.html
6. https://www.tutorialspoint.com/ipv4/ipv4_tcpip_model.htm

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	1		1	
CO2		2	1			2
CO3	1	2	2	2	1	3
CO4	1	2	1	1	1	2
CO5	1	2	2	2	1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITC53	PYTHON PROGRAMMING	CORE-11	5	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to develop the Website and Application in AI.

COURSE OBJECTIVES:

To enable the students

- understand about Basics of Python
- know about Functions and Strings.
- understand about File handling and Exception Handling.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	gain knowledge about basics of Python.	Upto K3
CO 2	understand the Operators, List and Tuples.	Upto K3
CO 3	learn about the Decision making and Loop control statements	Upto K3
CO 4	learn about the Function and String	Upto K3
CO 5	apply the Concept File Handling and Exception Handling	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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PYTHON PROGRAMMING

UNIT– I: Basics and Operators

Introduction to Python – Values and Types –Python Keywords–Identifier/Variable – I/O statements – (The printf () Function – The input () Function –The eval () Function) – Commenting in Python. Operators and Expressions – Arithmetic Operators – Operator Precedence and Associativity – Changing Precedence and Associativity of Arithmetic Operators – Translating Mathematical Formulae into Equivalent Python Expressions –Bitwise Operator –The Compound Assignment Operator

UNIT– II: Operators, Lists and Tuples

Boolean Type – Boolean Operators – Using Numbers with Boolean Operators – Using String with Boolean Operators – Boolean Expressions and Relational Operators. Lists – Creating Lists – Accessing Elements of a List –Negative List Indices –List Slicing [Start : End] –List Slicing with Step Size –Python Built–In Functions for Lists –The List Operator –Tuple – Introduction to Tuples – Creating Tuples – Inbuilt functions for Tuples –Indexing and Slicing – Operations on Tuples – Lists and Tuples – Sort the tuples.

UNIT– III: Decision Making Statements & Loop Control Statements

Decision Making Statements – Conditional Expressions – Loop Control Statements – The while Loop – The range () Function – The for Loop – Nested Loops – The break Statement – The continue Statement.

UNIT– IV: Functions and Strings

Functions – Syntax and Basics of a Function –Use of a Function – Parameters and Arguments in a Function – The Local and Global Scope of a Variable – The return Statement –Recursive Functions –The Lambda Function –The String Operators –String Operations.

UNIT– V: File Handling and Exception Handling

File Handling – Need of file Handling –Text Input and Output – Exception Handling – Errors and Exception –Python Exception and its Hierarchy –Handling Exception –Raising Exception – Modules –Packages on Python.

TEXT BOOK:

Problem Solving and Python Programming – Ashok NamdevKamthane and Amit Ashok Kamthane–McGrawHall Education 2018.

REFERENCE BOOKS:

1. *Problem Solving and Python Programming* – P.RadhaGanesan– Chess Educational Publishers
2. *Python Programming A Modular Approach* – SheetalTaneja and Naveen KumarPearson Publication
3. Tony Gaddis, *Starting out with Python (3C)*, Pearson, 2015.
4. Kenneth A.Lambert, *Fundamentals of Python*.

DIGITAL TOOLS:

1. <https://www.guru99.com/python-tutorials.html>,
2. <https://www.javatpoint.com/python-tutorial>,3.<https://www.studytonight.com/python/>
4. <https://www.programiz.com/python-programming>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2				
CO2		2	1			2
CO3	2			2	1	
CO4	2		2	1		2
CO5	2	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. R.P.UMADEVI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITCP5	LAB: PYTHON PROGRAMMING LAB	CORE-12 LAB	-	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to develop Website and Artificial Intelligence applications using Python programs.

COURSE OBJECTIVES:

1. To make the students improve their creativity during website creation.
2. To help them understand the concepts of Python
3. To develop their programming skills in Python

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand Basic concepts of python program and its execution.	Upto K3
CO 2	understand python structure and execute its application.	Upto K3
CO 3	understand about Operators and slicing technique.	Upto K3
CO 4	execute the programs using Decision making and looping statements.	Upto K3
CO 5	develop application using File Handling and Exception Handling	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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LAB: PYTHON PROGRAMMING

- Write a Python program to compute addition of two numbers.
- Write a Python program to finding Total, Average and grade system of Student Marks.
- Write a Python program to calculate Area and Circumference of a Circle.
- Write a Python program to compute Temperature Conversion.
- Write a Python program to calculate of Simple Interest (SI).
- Write a Python program to check whether the number is Positive Number or Negative Nos.
- Write a Python program to check whether the year is Leap Year or Not.
- Write a Python program to calculate greatest of three numbers.
- Write a Python program to check whether the number is Prime Number or Not.
- Write a Python program to check whether the number is ODD or EVEN Number.
- Write a Python program to Swapping of two numbers without using temporary variable.
- Write a Python program to print the Fibonacci series using recursion.
- Write a Python program to calculate Factorial of a given number using recursion function.
- Write a Python program to calculate sum of digits of a given number using function.
- Write a Python program to reverse the given input number using function.
- Write a Python program to check whether the number is Palindrome Number or Not.
- Write a Python program to check whether the number is Armstrong Number or Not.
- Write a Python program to find the minimum and maximum of a list of numbers.
- Write a Python program: “tuple1 = (10,50,20,40,30)”
- To display the elements 10 and 50 from tuple1
- To display length of a tuple1.
- To find the minimum element from tuple1.
- To add all elements in the tuple1. v. To display same tuple1 multiple times.
- Write a Python program.
- To calculate the length of a string.
- To reverse words in a string.
- To display same string multiple times.
- To concatenate two strings.
- Str1=”South India” , using string slicing to display “India”

COURSE DESIGNER: Prof. R. P.UMADEVI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE51	MOBILE COMPUTING	ELECTIVE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

It helps to provide the fundamentals of various handheld devices in Mobile computing and apply various mobile network architecture analyze them in short range connectivity.

COURSE OBJECTIVES:

1. To make the students understand the Basic Mobile Computing
2. To help the students understand the GPRS
3. To enable them understand the WAP

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Basic knowledge of Mobile computing architecture.	Upto K3
CO 2	learn about the Evolution of Telephony	Upto K2
CO 3	understand about the Data services in GPRS	Upto K2
CO 4	know about the Wireless Application protocol	Upto K3
CO 5	apply the Wireless technology in Wifi Application	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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MOBILE COMPUTING

UNIT– I:

Introduction – Mobility of Bits and Bytes – Wireless the beginning – Mobile computing – Mobile Computing Architecture – Three tier architecture– Design consideration for mobile computing.

UNIT– II:

Evolution of Telephony – Mobile computing through telephone – Emerging Technologies – Introduction – Bluetooth – Radio Frequency Identification

UNIT– III:

GPRS – Introduction and Packet Data Network – GPRS Network Architecture – Operations – Data services in GPRS

UNIT– IV:

Wireless Application Protocol – Introduction – WAP – MMS – GPRS application – CDMA

UNIT– V:

Wireless LAN: Introduction – wireless LAN Advantages – Wireless LAN security –Wifi Versus 3G

TEXT BOOK:

Mobile Computing Technology Applications and Service Creation Asoke K Talukder, Roopa R. Yavagal TMH publishing company New Delhi 2005.

CHAPTERS and SECTIONS (For UNIT–I, II, III, IV and V)

Unit – I: Chapter 1: 1.1–1.3 Chapter 2: 2.4–2.6

Unit – II: Chapter 3: 3.1–3.4 Chapter 4: 4.1–4.3

Unit – III: Chapter 7: 7.1–7.5

Unit – IV: Chapter 8: 8.1–8.4 Chapter 9: 9.1–9.2, 9.4–9.5

Unit – V: Chapter 10: 10.1–10.2, 10.4, 10.8, 10.12

REFERENCE BOOKS:

Mobile Computing – Rajkamal Published by Oxford Higher Education/Oxford University Press, 2011

DIGITAL TOOLS:

- <https://minigranth.in/mobile-computing-tutorial>
- <https://www.analyticssteps.com/blogs/introduction-mobile-computing>
- <https://www.geeksforgeeks.org/wireless-mobile-computing-technologies/>
- <https://www.wisdomjobs.com/e-university/mobile-computing-tutorial>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2	1	2	2			3
CO3	1	2	2			3
CO4	1	2	1	1	1	3
CO5	1	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE52	BIG DATA FUNDAMENTALS	ELECTIVE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

Big Data Fundamentals consists of Big Data Concepts and Terminology, Big data Adoption and Planning, Enterprise Technologies and Big Data Business Intelligence and its Storage Technology.

COURSE OBJECTIVES:

1. To enable the students understand the fundamental concepts of Big data
2. To help them interpret Big data Adoption and Planning and Big data Storage Concept
3. To make them understand Big data and Processing Concepts and Big Data Analysis Techniques

COURSE OUTCOMES (CO)

After the completion of the course, the students will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand about fundamental concepts of Big data	Upto K2
CO 2	describe Big data Adoption and Planning	Upto K2
CO 3	understand about Big data Storage Concepts	Upto K3
CO 4	utilize Big data and Processing Concepts	Upto K3
CO 5	understand about Big Data Analysis Techniques	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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BIG DATA FUNDAMENTALS

UNIT– I: Introduction

Understanding Big Data: Concepts and Terminology : Dataset , Data Analysis , Data Analytics – Big Data Characteristics– Different types of data. **Business Motivations and Drivers for Big data Adoption:** Business Process Management – Information and Communications Technology – Internet of Everything.

UNIT– II: Adoption and Planning

Big data Adoption and Planning Considerations: Organization Prerequisites – Data Procurement – Privacy – Security – Provenance – Limited Real time Support – Distinct Performance Challenges – Distinct Governance Requirements – Distinct Methodology – Clouds– Big Data Analytics Lifecycle.

UNIT– III: Big Data Business Intelligence

Enterprise Technologies and Big Data Business Intelligence: Online Transaction Processing(OLTP) – Online Analytical Processing(OLAP) – Extract Transform Load(ETL)–Data Warehouses – Data Marts. **Big Data Storage Concepts:** Clusters – File Systems and Distributed File Systems –NoSQL – Sharding– Replication –ACID – BASE.

UNIT– IV: Big Data Processing Concepts

Big Data Processing Concepts: Parallel Data Processing – Distributed Data Processing – Hadoop– Processing Workloads – Cluster – Processing in Batch Mode –processing with map reduce –Processing in Real time Mode – Speed Consistency Volume (SCV).

UNIT– V: Storage Technology

Big Data Storage Technology: On–Disk Storage Devices – RDBMS Database –NoSQL Databases – Types Key value, document, column family, graph – In–Memory Storage Devices . Big Data Analysis Techniques: Quantitative Analysis– Qualitative Analysis – Data Mining – Machine Learning – Semantic Analysis –

TEXT BOOK:

Big Data Fundamentals Concepts, Driver & Techniques, Thomas Erl, WajidKhattak and Paul Buhler, 3rdEdition, Pearson publication, 2018. Chapters: 1–8

REFERENCE BOOKS:

1. *Big Data Strategies*, Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.
2. *Big Data*, Dr. Anil Maheshwari, 1st edition , Published by McGraw Hill Education (India) Private Limited, 2017.
3. *Big Data and Analytics*, SeemaAcharya and Subhashini Chellappan, 2nd edition,Wiley India Private Limited, 2017.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2				
CO2		2	1			3
CO3	3	2	1	2	1	3
CO4		2	2	1	2	3
CO5	1	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level
COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE53	BIOMETRICS	ELECTIVE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

To Learn about the Biometrics authentication and analyze the Fingerprint and Hand Geometry with various recognition techniques and their future.

COURSE OBJECTIVES:

1. To give knowledge about Biometrics
2. To impart knowledge about Scanning and Fingerprints
3. To make the students understand about Biometric scanning and Evaluation

COURSE OUTCOMES (CO)

After the completion of the course, the students will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Authentication Techniques and Key Elements of Biometrics	Upto K2
CO 2	analyze the Fingerprint and Hand Geometry theoretically	Upto K2
CO 3	get the knowledge of Iris and Retina Scanning and Signature Recognition and Key stroke Dynamics	Upto K2
CO 4	analyze about Hand Grip, Brain Wave pattern and their future	Upto K3
CO 5	discuss the future of Biometrics and its Testing and Evaluation	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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BIOMETRICS

UNIT– I:

How Authentication technologies work : What you Know–Passwords and PINs– Cards and Tokens – What you are: Biometrics – Multi–Factor authentication – Subverting the system – Deploying Authentication systems – Economics of Authentication –How **Biometrics work :** Brief History of Biometrics – Why Use Biometrics – Key Elements of Biometric System.

UNIT– II:

Fingerprint and Hand Geometry: – History of Fingerprints – Hand Geometry –**Facial and Voice recognition:** Facial recognition application – Facial recognition Technology – Voice Verification

UNIT– III:

Eye Biometrics: Iris and retina Scanning: – Iris recognition technology – Applications – Retina Scanning – Accuracy.

Signature Recognition and Keystroke Dynamics: Signature Recognition – Keystroke Dynamics

UNIT– IV:

Esoteric Biometrics – Vein pattern – Facial Thermography – DNA– Sweat pores – Hand Grip – Fingernail Bed – Body Odor – Ear – Gait– Skin Luminescence – Brain Wave Pattern – Footprint and Foot Dynamics – The Future.

UNIT– V:

Biometrics in large Scale Systems – Getting Started– Documenting the procurement process – specifying the systems – Same AFIS RFP Overview.

Biometric Testing and Evaluation: –Who tests and Who Benefits– The three bears principle– Best practices for Biometrics testing – Types of Testing – Certification.

TEXT BOOK:

Biometrics – The Ultimate References, John D. Woodward, Jr. Nicholas M. Orlans , Peter T. Higgins – Dreamteach Publishers 2003

REFERENCE BOOK:

Guide to Biometric Reference Systems and Performance Evaluation Petrovska – Delacretaz ,Dijana, chollet, Gerard, Dorizzi, Bernadette

DIGITAL TOOLS:

1. <http://www.biometric-solutions.com/fingerprint-recognition.html>
2. <https://www.rfwireless-world.com/Tutorials/Biometric-technology-tutorial.html>
3. <https://www.javatpoint.com/biometrics-tutorial>
4. <https://www.tutorialspoint.com/biometrics>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2			2	
CO2	1	2	1			3
CO3	2	1	1	2	1	3
CO4	1	2	2	1	2	3
CO5	1	2	3	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. S.E. HEMAPRIYA



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITSP3	LAB:VB DOT NET	SBS-5 LAB	-	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

To get the knowledge of simple .Net Console application programs and Windows Application Programs with Menu driven programs.

COURSE OBJECTIVES:

- To make the students understand about both Console Applications and Windows Applications.
- To help them learn about Console application using structures, Function Overloading
- To make them Apply Windows Application using Advance Controls.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	get the knowledge of simple .Net Console application programs	Upto K3
CO 2	apply console application structure in .Net programming	Upto K3
CO 3	obtain the knowledge of simple .Net Windows Application	Upto K3
CO 4	use various menu controls using windows application in .Net program	Upto K3
CO 5	connect various records using Data Grid control and search and retrieve them	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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LAB: VB DOT NET

Console Application from .Net

1. Calculating Sales and Commission.
2. Calculating EB–Bill Preparation using Structure.
3. Sorting Numbers in an Given Array
4. Function Overloading using Switch Case

Windows Application from .Net

1. Creation of Class Checking ARMSTRONG & REVERSE a Number.
2. Displaying Directories Using TREEVIEW
3. Dialog Control (Open, Save, Color, Font)
4. Factorial, +ve –vezero, Sum of series using Status and Progress Bar.
5. Retrieving Record using DATAGRID
6. Displaying Record Using Combox Box, List Box and Data Grid.
7. Searching and Retrieving Record.

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITSP4	LAB: OS (LINUX)	SBS-6 LAB	-	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

To learn about Linux operating System, Shell commands, understanding System calls and able to do program development.

COURSE OBJECTIVE:

To make the students learn basic Linux commands, file permissions, shell programming basics, process signals and able to develop programs using shell script at a beginner level.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	understand Linux, basics of shell, files, directories and permission of files	Upto K3
CO2	explain about shell Scripts and shell filters	Upto K3
CO3	know basics of shell programming, various looping	Upto K3
CO4	understand about system calls, low level , processes and signals	Upto K3
CO5	analyse the Concept of program development, control flow, functions and procedures	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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LAB: OS (LINUX)

1. Shell Script for calculating Simple Interest
2. Shell Script for Swapping Two Numbers
3. Shell Script for Calculating EB–BILL
4. Shell Script for Checking +ve,-ne,zero numbers
5. Shell Script for Checking ODD or EVEN number
6. Shell Script for Generating ARMSTRONG Number
7. Shell Script for Generating PRIME Numbers
8. Shell Script for Checking ADAM Number
9. Shell Script for Generating an Multiplication Table
10. Shell Script for Generating Fibonacci Series
11. Shell Script for Finding NATURAL NUMBER,REVERSED,SUM OF DIGITS
12. Shell Script for Occurrence of a Characters

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE STRUCTURE – VI SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UITC61	Part – III: Core – 13: Software Engineering	5	3	25	75	100	4
2.	21UITC62	Part – III: Core –14 : Relational Database Management System	5	3	25	75	100	4
3.	21UITCP6	Part – III: Core – 15: Lab : Oracle	5	3	40	60	100	4
4.	21UITCP7	Part – III: Core – 16: Lab : HTML & PHP	5	3	40	60	100	4
5.		Part – III: Elective – 2:	5	3	25	75	100	5
	21UITE61	Principles of Information Security						
	21UITE62	Software Testing						
	21UITE63	Ethical Hacking						
6.	21UITEV1	Part – III : Elective–3: Project and Viva Voce	5	3	40	60	100	5
7.	21UGKY61	General Knowledge (Self–Study)	–	–	–	–	100	–
		TOTAL	30				700	26

*One elective course to be chosen from THREE courses

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

T – Theory

P – Practical



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITC61	SOFTWARE ENGINEERING	CORE – 13	5	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to learn the basic concepts of Software Engineering such as planning, design, coding, cost estimation , verification and validation.

COURSE OBJECTIVES:

To enable the students

- understand the concepts of Software Engineering.
- understand the concepts of Cost estimation.
- understand the concepts of Verification and Validation Techniques.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Planning and development process	Upto K3
CO 2	learn about the Software cost Estimation techniques	Upto K3
CO 3	understand how to prepare SRS and requirement specifications	Upto K3
CO 4	acquire the concepts of software designing and notations and	Upto K3
CO 5	apply the verification and validation techniques in software testing	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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SOFTWARE ENGINEERING

UNIT– I:

Introduction to Software Engineering Some definitions – Quality and productivity factors – Managerial issue. Planning a software project: Definition the problem – Developing a solution strategy– planning the development process – planning an organization structure – other planning activities.

UNIT– II: Software Cost Estimation

Software – Cost factors – software cost estimation techniques – Specification techniques – staffing –level estimation – estimating software maintenance costs.

UNIT– III: Software requirements definition

The software requirements specification – format languages and processors for requirements specification.

UNIT– IV: Software Design

Fundamentals Design concepts – Modules and modularizing Criteria Design Notations – Design Techniques – Detailed Design Consideration – Test plan – Mile stones walk through and inspection – Design guide lines.

UNIT – V : SPM

Introduction to Project – Software Project Management – Need of Software Project Management – Software Management Activities – Types of software project management : Conflict , Risk, Requirement , Change , Software Configuration , Release – Aspects of Management : Planning, Leading, Execution, Time Management , Budget , Maintenance – Disadvantage – Project Management Process : Feasibility Study, Project Planning, Execution, Termination – Software Development Paradigm : Waterfall Model, Spiral Model , Iterative Model , V Model.

TEXT BOOK:

Richard E.Fairly, *Software Engineering Concepts*, McGraw Hill Book Company.

E-Content : Unit - V

CHAPTERS and SECTIONS (For UNIT–I, II, III,IV)

Unit – I:	Chapter 1 (1.1, 1.3, 1.4) , Chapter 2(2.1 to 2.5)
Unit – II:	Chapter 3(3.1 to 3.4)
Unit – III:	Chapter 4(4.1 to 4.3)
Unit – IV:	Chapter 5(5.1 to 5.5, 5.7 to 5.9)

REFERENCE BOOK:

Roger S. Pressman, *Software Engineering: A Practitioner's Approach*, McGraw Hill International Book Company.

DIGITAL TOOLS:

- www.tutorialspoint.com/software_engineering/
 - www.computernotes.com/software-engineering
 - <https://www.geeksforgeeks.org/software-engineering-project-management-process/Unit V>
 - https://www.tutorialspoint.com/software_engineering/software_development_life_cycle.htm
- Unit - V

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2		1		
CO2		2	3			2
CO3	2			2	3	2
CO4	2		2	1		2
CO5	2	2	2	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level
COURSE DESIGNER: Prof. T.S.B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITC62	RELATIONAL DATABASE MANAGEMENT SYSTEM	CORE-14	5	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to provide fundamental concepts of Database Management System for the database architecture which enhances the user to analyze data normalization, Integrity Constraints and PL/SQL.

COURSE OBJECTIVES:

To learn various concepts of Database Architecture, Data Modeling, Analysis of Data Normalization, Integrity constraints , Queries and its Aggregate Functions and PL/SQL.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Quality of Information, Introduction of DBMS, RDBMS Characteristics, Types of DBMS	Upto K3
CO 2	know about Integrity Constraints .Apply the basic concepts of Database Architecture	Upto K3
CO 3	know about Data Modeling. Analyze the Data Normalization	Upto K3
CO 4	apply the Basic concept of SQL– Tables, Views and Indexes. Discuss about Queries , Sub Queries	Upto K3
CO 5	explain the application of Aggregate functions Discuss about Integrity Constraints and PL/SQL	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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B.Sc. INFORMATION TECHNOLOGY – SYLLABUS (Under CBCS based on OBE)(with effect from 2021 – 2022)

693

RELATIONAL DATABASE MANAGEMENT SYSTEM

UNIT – I: Introduction

Data, Information and Information processing : Introduction – Definition of Information – Quality of Information – Information Processing. Introduction to DBMS : Introduction – why a Database ? – characteristic of data in database – DBMS – why DBMS – Types of DBMS – DDLC.

UNIT – II: Introduction to RDBMS

Introduction – RDBMS Technology – The relational data structure – Relational Data Integrity – Codd's rules – Database Architecture and Data Modeling : Introduction, Conceptual. Physical and Logical Database Model – Database design – Design Constraints.

UNIT – III: E-R Model

E-R Modeling : Introduction – ER- Model – Components of an ER Model – ER Modeling Symbol – Data Normalization : Introduction – Keys – Relationship – 1NF – 2NF–3NF –4NF – 5NF – DKNF – Denormalization .

UNIT – IV: Introduction to SQL and Tables

SQL Data types and Literals – Types of SQL Commands – SQL Operators – Arithmetic – Compare operators – Logical operators – Set operators – operation procedure.

Tables: Create a Table – Modify a Table – Deleting a Table : Aggregate function . Queries and sub queries

UNIT – V:Aggregate Function and PL/SQL

Aggregate function – insert, update and delete operation – data integrity – PL/SQL Blocks – Control Structure – Iterative Control statement.

TEXT BOOK:

Database Management System – Mathews Leon and Alex Leon – Tata McGraw Hill Education.

Unit – I:	Chapter 1 : Pg.No. 1,3–5 Chapter 5 : 99–116, Chapter 6 : 138–143
Unit – II:	Chapter 7 : Pg.No. 159–168, Chapter 8 : Pg.No 177–186
Unit – III:	Chapter 9 : Pg.No.159–211
Unit – IV:	Chapter 14 : Pg.No. 296 – 310, Chapter 15 : Pg.No. 319–320, Chapter 17 : Pg.No. 355 – 376
Unit – V	Chapter 18 : Pg.No. 386 – 390, Chapter 19 : Pg.No. 395 – 398, Chapter 28 : Pg.No. 567 – 577, Chapter 29 : 605 – 606, Chapter 46.D – 934, 945–948, 952 – 958

REFERENCE BOOKS:

1. Raghu Ramakrishanan & Johannes Gehrke *Database Management Systems*, 2nd edition, McGraw Hill international Edition,2003
2. C.J.Date, *An Introduction to Database Systems*, Pearson education 8th edition

DIGITAL TOOLS:

1. <http://www.studytonight.com/dbms/rdbms-concept.php>
2. <https://www.tutorialspoint.com/sql>
3. <https://beginnersbook.com/2015/04/rdbms-concepts/>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1			1		
CO2		2	1	2		
CO3	1	2	2	2		3
CO4	1	2	2	2	1	3
CO5	1	2	2	3	1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. S. E. HEMAPRIYA



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITCP6	LAB: ORACLE	CORE-15 LAB	-	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

To Learn about Creation of Table, Insertion of table, Modify and Updation of table using DDL,DML and DML commands, Queries and Sub-queries , and implementing cursors, triggers in PL/SQL programs.

COURSE OBJECTIVES:

- To implement the DDL,DML,TML Commands in Queries (Simple and Join)
- To make the students understand the knowledge about Constraints
- To help them understand the knowledge about PL/SQL programming skills.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	practice creation of Tables and usage the Data Definition Language queries, Data Manipulation Language queries	Upto K3
CO 2	practice the Data Manipulation Language queries with Set operation , Mathematical calculation	Upto K3
CO 3	practice queries using various Aggregate functions, sub- queries	Upto K3
CO 4	practice basic PL/SQL programs and also use with Exception Handling	Upto K3
CO 5	practice simple PL/SQL Programs using Tables, Joins, Triggers, Cursors	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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LAB :ORACLE

SQL QUERIES

1. Execute DDL,DML and DCL Commands on Sample Tables.
2. Implementation of different types of constraints on Sample Tables.
3. Implementation of different types of operators and built-in functions with example
4. Implementation of Sub Queries and Nested Queries.
5. Implement Queries on Group by and Having Clause, Order by Clause.
6. Create Views ,Sequence on Sample Tables.

PL/SQL

1. Program using Iterative controls and Sequence Controls.
2. Program using Exception Handling.
3. Program using Implicit Cursors and Explicit Cursors.
4. Application development programs like Payroll, EB bill report generation and
5. Student details.
6. Program to join the tables.

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITCP7	LAB: HTML & PHP	CORE -16 LAB	-	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to learn the basic knowledge Designing a Web Page and also acquire the knowledge to learn programming in PHP to develop online applications.

COURSE OBJECTIVES:

To enable the students

- understand about the Tags.
- understand about Web Page Creation
- understand programming in PHP

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the basic concepts of HTML	Upto K3
CO 2	learn about the basic concepts of PHP	Upto K3
CO 3	understand about the Looping statements and User Defined functions	Upto K3
CO 4	know about the PHP server side scripting.	Upto K3
CO 5	acquire the knowledge for the development of webpage	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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LAB: HTML AND PHP

HTML:

1. Design student ID card using image tag.
2. Display various Subjects using Lists.
3. Design class Timetable using Tables.
4. Display various Text styles and Colors using Frames.
5. Design Student Admission Form.

PHP:

1. Arithmetic operations.
2. If, Else, Else–If statements.
3. For each statement and is function statements.
4. Continue Break statements.
5. Arrays.
6. String functions.
7. Personal information using Post method.
8. Bus Ticket Reservation using Post method.
9. Employee Details using Get method.
10. Student Details using Get method.
11. Calendar function.
12. Multiplication Table.
13. Inheritance.
14. Validation.
15. Session.

COURSE DESIGNER: Prof. R.P.UMADEVI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE61	PRINCIPLES OF INFORMATION SECURITY	ELECTIVE-2	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

This course helps us to learn about need for Security, types of attacks, threats and also to know the knowledge about security planning and implementation of firewall and access tools.

COURSE OBJECTIVES:

To make the students

- understand about the basic of security.
- understand about various Threats.
- understand about Security Technologies.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Basic knowledge of Information Security in Professionals.	Upto K3
CO 2	understand the Security Purpose to access the data.	Upto K3
CO 3	learn about the Managing the Risk control and its Strategies.	Upto K3
CO 4	know about the Plan, security policy, Security Technology	Upto K3
CO 5	implement the security using Firewalls and Biometric Access Tools.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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PRINCIPLES OF INFORMATION SECURITY

UNIT – I: Information Security

History of Information Security – What is Security – Components of Information System – Security System Development Life Cycle – Security Professionals and the Organization – Communities of Interest – Information Security Is it an Art or Science.

UNIT – II: Why Security is Needed

Business Needs First – Threats: Deliberate Software Attacks : Virus, Worms, Trojan Horses – Deviations in Quality of Services – Forces of Natures – Human Error or Failure – Thefts – Technical Hardware Failure or Errors – Technical Software Failure or Errors. Attacks: Malicious Code, Hoaxes, Backdoors, Password Check, Denial of Service, Spoofing, Spam, Mail bombing , Timing Attack.

UNIT – III: Managing IT Risk

Overview of Risk Management – Risk Identification : Plan and Organize the Process , Asset Identification and Inventory , Information Asset Valuation – Risk Control Strategies: Defend , Transfer ,Mitigate , Accept , Terminate – Selecting Risk Control Strategy: Feasibility Studies , Cost Benefit Analysis (CBA), Evaluation, Assessment and Maintenance of Risk Control.

UNIT – IV: Plan for Security

Information Security, Planning and Governance – Information Security Policy, Standards and Practices : Definition, EISP , ISSP – Security Education , Training and Awareness Program – Continuity Strategies : Business Impact Analysis , Incident Response Planning. Security Technology: Access Control – Identification, Authentication, Authorization , Accountability.

UNIT – V: Security Technology

Firewalls – Firewall Processing Modes, Firewall Categorized by Generation , Firewall Categorized by Structure , Remote Access , VPN

Scanning And Analysis Tools: Port Scanner , Firewall Analysis Tools , Operating System Detection Tools , Vulnerability Scanners , Packet Sniffers – Biometric Access Tools .

TEXT BOOK:

Principles of Information Security – Michael E.Whitman and Herbert J.Mattord 4th Edition.

CHAPTERS and SECTIONS (For UNIT–I, II, III,IV and V)

Unit – I:	Chapter 1: Page No. 3–11,16–19, 26–32
Unit – II:	Chapter 2 : Page No. 39–48, 54–57,61–62, 63–68,72 (Timing attack only)
Unit – III:	Chapter 4: Page No. 117–132,144–153
Unit – IV:	Chapter 5: Page No. 168–178,203–221 Chapter 6: Page No. 238–242
Unit – V:	Chapter 6: Page No. 242–255,270–277 Chapter 7: Page No. 318–326,331–333



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REFERENCE BOOKS:

1. *Computer Security Art and Science*, Matt Bishop, Pearson/PHI, 2002.
2. *Information Security–Principles and Practices*– Mark S. Merkow, Jim Breithaupt · 2014–Pearson Education.
3. *Information Security Management Principles*– Andy Taylor– 2013–BCS Learning & Development Limited.

DIGITAL TOOLS:

1. <https://www.geeksforgeeks.org/principle-of-information-system-security/>
2. <https://www.tutorialspoint.com/principles-of-information-system-security>
3. <https://www.vskills.in/certification/tutorial/information-security-principles/>
4. <https://study.com/academy/lesson/information-security-basic-principles.html>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2		1		3
CO2		2	1			3
CO3	1			3	3	2
CO4	1		2	1		2
CO5	1	2	2	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE62	SOFTWARE TESTING	ELECTIVE-2	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps to acquire the knowledge about the phases software lifecycle and also to know various types of testing in automation. This course help us to learn about the test planning, management, execution and reporting.

COURSE OBJECTIVES:

To help the students

- understand Basic Testing Concepts
- understand Various Testing
- understand the Execution and Reporting

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	learn about the phases of Software Project and SDLC	Upto K3
CO 2	understand the Black Box Testing Techniques	Upto K3
CO 3	learn about the System and summary of Testing Phases	Upto K3
CO 4	learn and apply technology in Performance Testing and Regression Testing in software	Upto K3
CO 5	implement Test Planning, Execution and Reporting.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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SOFTWARE TESTING

UNIT-I: Software Development Life Cycle models

Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases – Life Cycle models. **White-Box Testing:** Static Testing – Structural Testing –Challenges in White-Box Testing

UNIT – II: Black-Box Testing

What is Black-Box Testing? – Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing –**Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

UNIT – III: System and Acceptance Testing

System Testing Overview – Why System testing is done? – Functional versus Non-functional Testing – Functional testing – Nonfunctional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT – IV: Performance Testing

Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT – V: Test Planning, Management, Execution and Reporting

Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics

TEXT BOOK:

Software Testing Principles And Practices– Srinivasan Desikan & Gopal swamy Ramesh,2006, Pearson Education

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

UNIT-I:	2.1–2.5, 3.1–3.4,	UNIT-IV:	7.1–7.6, 8.1–8.5
UNIT-II:	4.1–4.4, 5.1–5.5,	UNIT-V:	15.1–15.6, 17.4–17.7
UNIT-III:	6.1–6.7		

REFERENCE BOOKS:

1. *Effective Methods Of Software Testing*–William E.Perry, 3rd ed,Wiley India.
2. *Software Testing*– RenuRajani, Pradeep Oak, 2007, TMH

DIGITAL TOOLS:

1. www.tutorialpoint.com,
2. www.wikipedia.org/software-testing
3. www.guru99.com

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2		1		3
CO2		2	1			3
CO3	1			3	3	2
CO4	1		2	1		2
CO5	1	2	2	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. R.P.UMADEVI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITE63	ETHICAL HACKING	ELECTIVE-3	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps us to learn about need for Security, types of attacks, threats and also to know the knowledge about security planning and implementation of firewall and access tools.

COURSE OBJECTIVES:

To make the students

- understand about the basic of security.
- understand about various Threats.
- understand about Security Technologies.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Basic knowledge of Hacking and types of attacks	Upto K3
CO 2	explain about the Foot printing methods ,tool and ensure to protect environment.	Upto K3
CO 3	apply to safe ethical techniques in the world wide web to be beneficial to the society.	Upto K3
CO 4	examine and understand the knowledge about various techniques cracking tools , Keyloggers and spyware	Upto K3
CO 5	understand about penetration testing and evaluate, improve the testing.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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ETHICAL HACKING

UNIT-I: Introduction to Hacking

Importance of Security – Elements of Security – Phases of an Attack – Types of Hacker Attacks – Hacktivism – Vulnerability Research.

UNIT-II: Foot Printing

Introduction to Foot printing – Information Gathering Methodology – Foot printing Tools – WHOIS Tools – DNS Information Tools – Locating the Network Range.

UNIT-III: Scanning

Objectives – Scanning Methodology – Tools – Introduction to Enumeration – Enumeration Techniques – Enumeration Procedure – Tools.

UNIT-IV: Cracking Passwords

Password Cracking Websites – Password Guessing – Password – Cracking Tools – Password Cracking – Counter measures – Escalating Privileges – Executing Applications – Keyloggers and Spyware

UNIT-V: Penetration Testing

Introduction to Penetration Testing, Phases of penetration testing, tools.

TEXT BOOK:

Ec-Council, *Ethical Hacking and Countermeasures: Attack Phases*, Delmar Cengage Learning, USA, 2009.

Unit – I:	Chapter 1 (Sec: 1.1 to 1.10)
Unit – II:	Chapter 2(Sec: 2.1 to 2.29)
Unit – III:	Chapter 3(Sec: 3.1 to 3.46), Chapter 4 (Sec: 4.1 to 4.35)
Unit – IV:	Chapter 5(Sec: 5.1 to 5.37)
Unit – V:	Chapter 6(Sec: 6.1 to 6.27)

REFERENCE BOOKS:

1. Gary Hall, *Hacking, Computer Hacking, Security Testing, Penetration Testing, and Basic Security*, Kindle Edition, Kindle Direct Publishing, USA, 2016.
2. Alan T. Norman, *Computer Hacking Beginners Guide*, Kindle Edition, Kindle Direct Publishing, USA, 2016.
3. Andrew Huang, *The Hardware Hacker*, 1st Edition No Starch Press, USA, 2017.

DIGITAL TOOLS:

<https://www.synopsys.com>

<https://www.simplilearn.com › cyber-security-tutorial>

<https://www.javatpoint.com › ethical-hacking-tutorial>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	3	3	2	2
CO2	2	1	3	2	3	3
CO3	1	3	2	3	2	2
CO4	3	2	3	3	3	2
CO5	3	3	2	2	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level
COURSE DESIGNER: Prof. T. S. BARUN PRASANTH



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UITEV1	PROJECT WORK & VIVA VOCE	ELECTIVE – 3	-	5	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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PROJECT VIVA – VOCE

1. A Maximum of two students can join to do the project work.
2. Students must undertake the project work under the guidance of a faculty member
3. Progressive reports have to be submitted to the guide periodically
4. The internal test marks is 40 and is divided into the following components
 - (i) Two Presentations (2 x 10) – 20 Marks
 - (ii) Progressive Reports – 10 Marks
 - (iii) Internal Viva–voce – 10 Marks
5. The external examination will be jointly conducted by both the Internal and External Examiners
6. The Student must submit 3 copies (2 copies for students + 1 copy for the Dept.) of their project Report two week before the external examination.
7. The maximum marks for the external examinations is 60 and it may be divided into the following components
 - (i) Project Report – 20 marks
 - (ii) Project Presentation – 20 marks
 - (iii) Project viva–voce – 20 marks