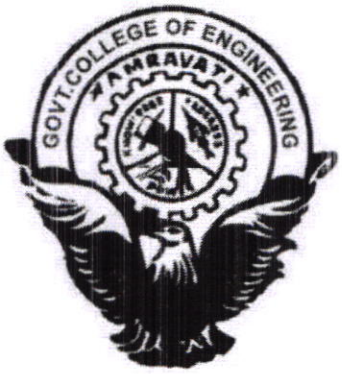
GOVT. COLLEGE OFENGINEERING, AMRAVATI



B. TECH. (Information Technology)
Second Year Curriculum
Department of Information Technology
2020-21

GOVERNMENT COLLEGE OFENGINEERING, AMRAVTI.

Department of Information Technology. Proposed

Scheme for B. Tech. (Information Technology) SEM III

Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						
							Theory			Practical			
			Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE	Total	Credits
PCC	ITU321	Computer Organization & Architecture	3	-	-	3	30	10	60	--	--	100	3
PCC	ITU322	Data Structure & Algorithms	4	--	-	4	30	10	60	--	--	100	4
ESC	ITU323	Digital Logic Design	3		-	3	30	10	60	--	--	100	3
BSC	SHU321B *SHU322B	Transform and Linear Algebra Differential Equation and Transform	3	1	-- -	4	30	10	60	--	--	100	4
MC	SHU323	Introduction to Constitution of India	1	--	-	1	--	20	30	-	--	50	-
HSMC	SHU324	Effective Technical Communication	3		-	3	30	10	60	--	--	100	3
PCC-LC	ITU324	Data Structure & Algorithms Lab	-		2	2	--	--	--	25	25	50	1
ESC-LC	ITU325	Digital Logic Design Lab	-	--	2	2	--	--	--	25	25	50	1
PCC-LC	ITU326	Object Oriented Technology Lab	2	--	4	6	--	--	--	50	50	100	4
	Total		19	1	08	28	150	70	330	100	100	750	23

* For Direct second year admitted students

SEM IV

Category	Course Code	Nameofthe Course	Teaching Scheme				Evaluation Scheme						
							Theory			Practical			
			Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE	Total	Credits
PCC	ITU421	Discrete Mathematics	3	1	--	4	30	10	60	---	--	100	4
PCC	ITU422	Database Management Systems	3	--	--	3	30	10	60	---	--	100	3
PCC	ITU423	Operating System	3	--	--	3	30	10	60	---	--	100	3
PCC	ITU424	Design & Analysis of Algorithms	3	--	--	3	30	10	60	---	--	100	3
HSMC	ITU425	Organizational Behavior	3	--	--	3	30	10	60	---	--	100	3
MC	SHU422	Environmental Studies	1	--	--	--	--	20	30	---	-	50	-
PCC-LC	ITU426	Database Management Systems Lab	---	--	2	2	---	--	---	25	25	50	1
PCC-LC	ITU427	Operating System Lab	---	--	2	2	---	--	---	25	25	50	1
PCC-LC	ITU428	Design & Analysis of Algorithms Lab	---	--	2	2	---	--	---	25	25	50	1
PCC-LC	ITU429	Python Programming Lab	---	--	4	4	---	--	---	25	25	50	2
	Total		16	1	10	27	150	70	330	100	100	750	21

TA : Teacher Assessment **CT: Class Tests** **ESE: End Semester Examination** **ICA :Internal Continuous Assessment**

Department of Information Technology

Proposed Scheme for B. Tech.

(Information Technology) SEM V

Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						
							Theory			Practical			
			Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE	Total	Credits
PCC	ITU521	Software Engineering	3	1	-	4	30	10	60	---	---	100	4
PCC	ITU522	Computer Network	3	---	-	3	30	10	60	---	---	100	3
PCC	ITU523	Formal Languages & Automata Theory	3	1	-	4	30	10	60	---	---	100	4
PCC	ITU524	Machine Learning	3		-	3	30	10	60	---	---	100	3
PEC	ITU525	Program Elective- I	3	---	-	3	30	10	60	--	--	100	3
PCC	ITU526	Data Warehousing &Data Mining	3	1	-	4	30	10	60	--	--	100	4
PCC-LC	ITU527	Computer Network Lab	-	---	2	2	---	--	---	25	25	50	1
PCC-LC	ITU528	Machine Learning Lab	-	---	2	2	---	--	---	25	25	50	1
PCC-LC	ITU529	Software Engineering Lab	-	--	2	2	---	--	---	25	25	50	1
PCC-LC	ITU530	Data Warehousing &Data Mining Lab			2	2	--	--	--	25	25	50	1
		Total	18	3	8	29	180	60	360	100	100	800	25

SEM VI

Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						
							Theory			Practical			
			Theory hrs/wee	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE	Total	Credits
PCC	ITU621	Geo Spatial Technologies	3	--	-	3	30	10	60	---	---	100	3
PCC	ITU622	Artificial Intelligence	3	1	-	4	30	10	60	---	---	100	4
PEC	ITU623	Program Elective- II	3	---	-	3	30	10	60	---	---	100	3
PEC	ITU624	Program Elective- III	3	---	-	3	30	10	60	---	---	100	3
PCC	ITU625	Cloud Computing	3	--	-	3	30	10	60	---	---	100	3
OEC	ITU626	Open Elective-I	3	---	-	3	30	10	60	---	---	100	3
PCC-LC	ITU627	Geo Spatial Technologies Lab	-	---	2	2	---	--	---	25	25	50	1
PCC-LC	ITU628	Artificial Intelligence Lab	-	-	2	2	---	--	---	25	25	50	1
PCC-LC	ITU629	Web & Internet Technology Lab	-	---	4	4	---	--	---	25	25	50	2
PROJ	ITU630	Minor Project	-	---	6	6	---	--	---	50	50	100	3
		Total	18	1	14	33	180	60	360	125	125	850	**26**

TA :Teacher Assessment **CT: Class Tests** **ESE: End Semester Examination** **ICA :Internal Continuous Assessment**

Program Elective- I ITU526

A) **Information Retrieval**
B) **Parallel Architecture**
C) **Internet of Things**

Program Elective- II ITU623

A) **Web Mining**
B) **Parallel Programming**
C) **Wireless & Mobile Computing**

Program Elective- III ITU624

A) **Network Architecture and Wireless Protocols**
B) **Software Project Management- Industry Perspective**
C) **Distributed Computing**

Department of Information Technology.

Proposed Scheme for B. Tech.

(Information Technology) SEM VII

Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						Credits
							Theory			Practical		Total	
			Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE		
PEC	ITU721	Program Elective-IV	3	-	--	3	30	10	60	---	---	100	3
PEC	ITU722	Program Elective-V	3	-	--	3	30	10	60	---	---	100	3
OEC	ITU723	Open Elective-II	3	-	--	3	30	10	60	---	---	100	3
HSMC	SHU725	Human Values and Ethics	2	-	--	2	--	20	30	---	---	50	-
PROJ	ITU724	Project Phase -I	-	-	14	14	-	-	-	100	---	100	7
	Total		11	-	14	25	90	50	210	100	---	450	16

SEM VIII

Category	Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						Credits
							Theory			Practical		Total	
			Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	MSE	TA	ESE	ICA	ESE		
PEC	ITU821	Program Elective-VI	3	-	--	3	30	10	60	---	---	100	3
PROJ	ITU822	A) Project and Seminar **OR** B)Industry Internship Project	-	-	16	16	--	--	--	150	150	300	8
	Total		3	-	16	19	30	10	60	150	150	400	11

TA :Teacher Assessment **CT: Class Tests** **ESE: End Semester Examination** **ICA :Internal Continuous Assessment**

Program Elective- IV ITU721

A) Data Analytics

B) Ad-Hoc Networks

C) Natural Speech & Language Processing

D) Information Security

Program Elective -V ITU722

A) Digital Forensics

B) Advances in Programming Languages

C) Signals and Networks

D) Human Computer Interaction

Program Elective –VI ITU821

A) Cryptography and Network Security

B) Graph Mining

C) Real Time Systems

D) Augmented Reality

Open Elective- I

A) Computer Oriented Operation Research

B) Introduction to Data Structures

Open Elective-II

A) Software Engineering

B) Data Communication

Government College of Engineering, Amravati

Department of Information Technology

Program Educational Objectives

PEO 1: To formulate, analyze and solve real life problems in software industry, research academia and society at large.

PEO 2: To provide opportunity to learn the latest trends in information technology and prepare for lifelong learning process.

PEO 3: To exhibit strong communication and interpersonal skills, broad knowledge, and global perspectives to work effectively and ethically in multidisciplinary teams.

Program Specific Outcomes

PSO 1: To develop technically sound human resource that shows inclination to pursue IT career in profession, research and higher education.

PSO 2: To exhibit the knowledge of algorithms, data structures /management, software design, information security, programming languages, computer organization and architecture and data science and analytics as a IT professional.

Department of Information Technology
Equivalence Scheme
Programme Name: B.Tech. Information Technology
(III & IV Semester)

Sr.No.	Course code with Name of course(old)		Course code with Name of course (new)	
1.	ETU 311	Electronic Devices and Circuits		No Equivalence
2.	CSU 301	Programming Methodology		No Equivalence
3.	ITU 301	Communication Engineering		No Equivalence
4.	CSU 303	Discrete Mathematics and Graph Theory	ITU421	Discrete Mathematics
5.	SHU305	General Proficiency II		No Equivalence
6.	ETU312	Electronic Devices and Circuits Lab		No Equivalence
7.	CSU304	Programming Methodology Lab		No Equivalence
8.	ITU302	Communication Engineering Lab		No Equivalence
9.	CSU306	System administration-I Lab		No Equivalence
10.	CSU401	Numerical Method and Computer Programming		No Equivalence
11.	CSU402	Data Structure	ITU322	Data Structure & Algorithms
12.	CSU403	Object Oriented Technology		No Equivalence
13.	ITU401	Digital Integrated Circuits	ITU323	Digital Logic Design
14.	ITU 402	Data Communication		No Equivalence
15.	CSU404	Data Structure Lab	ITU325	Data Structure & Algorithms Lab
16.	ITU403	Data Communication Lab		No Equivalence
17.	CSU405	Object Oriented Technology Lab		No Equivalence
18.	ITU404	Digital Integrated Circuit Lab	ITU325	Digital Logic Design Lab
19.	CSU406	System Administration-II Lab		No Equivalence
20.	ITU609	Computer Organization	ITU321	Computer Organization & Architecture
21.	CSU402	Data Structure	ITU322	Data Structure & Algorithms
22.	ITU401	Digital Integrated Circuits	ITU323	Digital Logic Design
23.	CSU404	Data Structure Lab	ITU324	Data Structure & Algorithms Lab
24.	ITU404	Digital Integrated Circuit Lab	ITU325	Digital Logic Design Lab
25.		No Equivalence	ITU326	Object Oriented Technologies Lab
26.	CSU 303	Discrete Mathematics and Graph Theory	ITU421	Discrete Mathematics
27.	ITU502	Database Management Systems	ITU422	Database Management Systems
28	CSU602	Operating System Design	ITU423	Operating System
29	ITU601	Design and Analysis of Algorithms	ITU424	Design & Analysis of Algorithms
30		No Equivalence	ITU425	Organizational Behaviour
31	CSU606	Operating System Design Lab	ITU427	Operating System Lab
32	ITU604	Design & Analysis of Algorithms Lab	ITU428	Design & Analysis of Algorithms Lab
33		No Equivalence	ITU429	Python Programming Lab

Dr. K. P. Wagh

Shinde

Equivalence B. Tech. Second Year SH Courses A.Y. 2020-21

S.N.	Course in old scheme			Equivalent course in new Scheme		
	Course Code	Course name	No. of Credits	Course Code	Course name	No. of Credits
1	SHU301	Engineering Mathematics- III	03	SHU321A	Differential Equations And Probability	03
2		No Equivalence		SHU322A	Integral Calculus And Probability	03
3	SHU304	Engineering Mathematics- III	03	SHU321B	Transform And Linear Algebra	04
4		No Equivalence		SHU322B	Differential Equation And Transform	04
5	SHU303	Engineering Mathematics- III	03	SHU321C	Transform And Statistical Methods	04
6		No Equivalence		SHU322C	Integral Calculus And Probability	04
7		No Equivalence		SHU323	Introduction To Constitution Of India	00
8		No Equivalence		SHU324	Effective Technical Communication	03
9		No Equivalence		SHU325	Human Values And Ethics	00
10	SHU203	Environmental Studies	03	SHU422	Environmental Studies	00
11		No Equivalence		SHU425	Human Values And Ethics	00
12		No Equivalence		SHU525	Human Values And Ethics	00
13		No Equivalence		SHU725	Human Values And Ethics	00
14	SHU305	General Proficiency- II	2		No Equivalence	
15	SHU401	Engineering Mathematics- IV	3		No Equivalence	
16	SHU402	Engineering Mathematics Lab	2		No Equivalence	
17	SHU403	Engineering Mathematics Lab	2		No Equivalence	

Pulkane

Head, Mathematics

Member secretary
BoS Science & Humanities

Chairman
BoS Science & Humanities

ITU321 COMPUTER ORGANIZATION AND ARCHITECTURE

Teaching Scheme : 03 L + 00T Total 03 **Credits : 03**
Evaluation Scheme: 30MSE +10TA+ 60ESE **Total Marks: 100**
Duration of ESE: 2Hrs.30min

Course Objectives

I. To understand the structure, function and characteristics of computer systems.
II. To understand the design of the various functional units and components of computers.
III. To identify the elements of modern instructions sets and their impact on processor design.
IV. To explain the function of each element of a memory hierarchy,
V. To identify and compare different methods for computer I/O.

Computer Organization: Computer types, Structure with basic computer components, Function in brief with instruction fetch and execute, Interrupts and I/O communication, Interconnection structure, bus interconnection, Multiple Bus hierarchies, Elements of bus design Performance metrics and measurement.

Computer Memory System: Characteristics of memory system, Memory hierarchy, Cache Memory- Cache memory principles, Elements of cache design- cache address, size, mapping functions, replacement algorithms, write policy, Internal Memory- semiconductor memory, External Memory- Hard Disk organization, RAID.

Input and Output System: I/O modules- Module function and I/O module structure, Programmed I/O , Polling I/O, Interrupt driven I/O , DMA function, Synchronous and Asynchronous serial data communication, Computer peripherals like keyboard, mouse, printer, scanner and display devices.

Processor Organization: Evolution of Intel processor architecture- 4 bit to 64 bit, Control unit Hardwired and microprogrammed, concept of pipelining, Study of microprocessor 8085, Functional pins and Register organization, Memory mapped I/O and I/O mapped I/O schemes.

Instruction Set and Assembly Language Programming: Addressing modes and Formats- immediate, direct, indirect, register, register indirect, displacement and stack, Instruction Cycle machine cycle and Data flow, 8086 instruction set and assembly programming, Time delay concept , stack and subroutines, Interrupt handling, Instruction set architecture RISC and CISC.

Text books

1. "Computer Organization and Architecture", William Stallings, 7th edition, Prentice Hall of India, 2008
2. "The 8086/8088 Microprocessor: Architecture, Programming, and Interfacing", Barry B. Brey, Merrill Publishing Company, 1987

Reference books

1. "Computer Organization", C. Hamacher, V. Zvonko, S. Zaky, 5th edition, McGraw Hill, 2002,
2. "Computer Architecture and Organization", Hayes, J.P., 3rd Edition, Tata Mc-Graw Hill, 1998.
3. "Structured Computer Organization", A. Tannenbaum,6th edition, Pearson Education, 2013

Course outcomes

On completion of the course, student will be able to:

ITU321.1 Describe the organization of a computer system in terms of its main components.
ITU321.2 Demonstrate computer architecture concepts related to design of modern processors memories and I/Os.
ITU321.3 Identify various parts of a system memory hierarchy.
ITU321.4 Analyze the performance of commercially available computers.
ITU321.5 Develop logic for assembly language programming.

ITU 322 DATA STRUCTURE AND ALGORITHMS

Teaching Scheme : 04L Total 04 **Credits : 04**
Evaluation Scheme: 30 MSE +10 TA+ 60 ESE **Total Marks: 100**
Duration of ESE : 2Hrs.30min

Course Objectives

I. To impart the basic concepts of data structures and algorithms.
II. To understand concepts about searching and sorting techniques
III. To understand basic concepts about stacks, queues, lists, trees and graphs.
IV. To enable them to write algorithms for solving problems with the help of fundamental data structures

Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Searching: Linear Search and Binary Search Techniques and their complexity analysis.

Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly ,Circular linked list: operations on it.