SRI RAMAKRISHNA
COLLEGE OF ARTS AND SCIENCE
(An Autonomous Institution)
Nava India, Avinashi Road, Coimbatore

Scheme of Examination

(For the students admitted during the academic year 2020 - 2021 and onwards)

Under
Choice Based Credit System (CBCS)
&Learning Outcomes-Based Curriculum Framework (LOCF)

UNDERGRADUATE PROGRAMMES

Programme: BSc **Branch: Information Technology**

Part	Course Code	Study Components and Course Title	CIA	Comprehensive Exam (Theory)			Total Marks	Credit
				Online	Descriptive	Total		
Semester – I								
I	20TA01/ 20HA01/ 20MA01/ 20FA01/ 20AA01	Language-I/**AECC-II** (MIL)	40	10	50	60	100	3
II	20EA01	English-I/**AECC-I**	40	10	50	60	100	3
III	20CSC01	CORE / **DSC-I** Digital Fundamentals and Computer Organization	40	10	50	60	100	3
	20UIT11	Analog And Digital Electronics ##						
III	20ITC01	CORE / **DSC-II** Programming in C	40	10	50	60	100	4
	20UIT12	Networking And Data Communication##						
III	20ITC02	CORE / **DSC-III** Practical: C Programming and Bio Computing Lab	40	-	-	60	100	3
	20UIT13	PC Fundamentals (Computer Architecture And Peripherals) ##	40	10	50			
III	20MATCG13	Allied-I /**GE-I** ALLIED I –Mathematics for Computing – I	40	10	50	60	100	4
IV	20EIA01	Foundation Course on Entrepreneurship & Innovation # / **AECC**	100	-	-	-	100**	1#

IV	20LSA01	Life Skills-I @ / **SEC**	-	-	-	100	100**	2 @
V	20NS01/ 20NC01/ 20SP01/ 20YR01/ 20SI01/ 20RB01	Extension Activities NSS/NCC/SPORTS/YRC/SIS/ RBC	Assessment will be in the Final Semester					
Semester –II								
I	20TA02/ 20HA02/ 20MA02/ 20FA02/ 20AA02	Language-II /**AECC-II** (MIL)	40	10	50	60	100	3
II	20EA02	English-II /**AECC-I**	40	10	50	60	100	3
III	20CACP01	CORE / **DSC-IV** Data Structures and Lab Using C	50	-	50	50	100	5
	20UIT21	A+ - Hardware Essential##	40	10	50	60		
III	20CSCP01	CORE / **DSC-V** Java Programming with Bio-Perl Lab	50	-	50	50	100	5
	20UIT22	Operating Systems	40	10	50	60		
III	20ITE01/02/03	Electives / **DSE-I**	40	10	50	60	100	4
	20ITE01/02/03	Electives / **DSE-I**##						
III	20MATCG14	Allied-II /**GE-II** ALLIED-II Mathematics for Computing -II	40	10	50	60	100	4
IV	20ESA01	Environmental Studies #/**AECC**	100	-	-	-	100**	1#
IV	20LSA02	Life Skills-II @/ **SEC**	-	-	-	100	100**	2 @
IV	20ITT01	Internship / Institutional Training / Mini-Project (Summer Course-1 #)	100#	-	-	-	100**	1$
Semester III								
III	20IT301	CORE / **DSC-VI** - Python with Bio Python Lab	50	-	50	50	100	5
III	20CAC01	CORE / **DSC-VII** Database Management System	40	10	50	60	100	3
III	20ITC03	CORE / **DSC-VIII** - Computer Networks	40	10	50	60	100	3
III	20CAC02	CORE / **DSC XI**– Practical: Database Management System Lab	40	10	50	60	100	3
III	20ITI01	Open Elective-1/**AEE-I**	40	10	50	60	100	4

III	20MATCG15	Allied-III /**GE-III** Operations Research	40	10	50	60	100	4
III	20ITE04/05/06	**Electives / DSE- II**	40	10	50	60	100	4
IV	20BCT01/ 20AT01	Basic Tamil-I / Advanced Tamil-I #	100	-	-	-	100**	1$
IV	20PEA01	PACE-I @ / **SEC-I**	-	-	-	100	100**	1@
IV	20ITV01	JOC / VAC-I$	-	-	-	-	-	1$
Semester IV								
III	20IT402	CORE / **DSC-X** – Web Programming with Bio Perl Lab	50	-	50	50	100	5
III	20IT401	CORE / **DSC-XI** – Data Science Using R	40	-	-	60	100	3
III	20ITC04	CORE / **DSC-XII** - Software Engineering	40	10	50	60	100	3
III	20CSC02	CORE / **DSC-XIII** - Artificial Intelligence	40	10	50	60	100	4
III	20IT403	CORE / **DSC-XIV** - Practical: R Programming Lab	40	10	50	60	100	3
III	20ITE07/08/09	Electives / **DSE-III**	40	10	50	60	100	4
III	20COCGE1	Allied-III /**GE-III** Business Accounting	40	10	50	60	100	4
IV	20BCT02/ 20AT02	Basic Tamil-II / Advanced Tamil-II #	100	-	-	-	100**	1$
IV	20PEA02	PACE-II @ / **SEC-II**	-	-	-	100	100**	1@
IV	20ITV02	JOC/VAC–II $	-	-	-	-	-	1$
IV	20ITT02	Internship / Institutional Training / Mini-Project (Summer Course-2 #)	100#	-	-	-	100**	1$
Semester V								
III	20CAC04	CORE / **DSC-XV** – Operating System	40	10	50	60	100	3
III	20CAC05	CORE / **DSC-XVI** – Practical: Operating System Lab	40	-	-	60	100	3
III	20ITC05	CORE / **DSC-XVII** – Machine Learning	40	10	50	60	100	3
III	20IT501	CORE / **DSC-XVIII** – Cloud Computing	40	10	50	60	100	3

III	20IT502	CORE / **DSC-XIX** – Practical: Machine Learning with Bio Tools Lab	40	10	50	60	100	3
III	20ITI02	Open Elective-II/**AEE-II**	40	10	50	60	100	4
III	20ITE10/11/12	Electives/**DSE-IV**	40	10	50	60	100	4
IV	20PEA03	PACE-III @ / **SEC-III**	-	-	-	100	100**	1@
IV	20ITV03	JOC/VAC-III $	-	-	-	-	-	1$
Semester VI								
III	20IT601	CORE / **DSC-XX** - Internet of Things	40	10	50	60	100	3
III	20IT602	CORE / **DSC-XXI** - Augmented and Virtual Reality	40	10	50	60	100	3
III	20IT603	CORE / **DSC-Graduation Project /** Student Research					100	5
IV	20ITS01	**Self-Study Course** MongoDB					100**	3$
V	20NS01/20NC01/20SP01/20YR01/20SI01/ 20RB01	Extension Activities NSS/NCC/SPORTS/YRC /SIS/ RBC #	100	-	-	-	100**	1

$ Extra credit courses in which Basic Tamil and Advanced Tamil are for the candidates who opted other than Tamil Language in Part–I.

 # Continuous Internal Assessment (CIA) only.

@ Comprehensive Examinations only.

****Not included in Total Marks and CGPA Calculation.**

Abstract of
Scheme of Examination
(For the students admitted during the academic year 2020 - 2021 and onwards)

Part	Course	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages/**AECC-II** (MIL)	2	3	**6**	100	**200**
Part II	English/**AECC-I**	2	3	**6**	100	**200**
Part III	Core /**DSC**	15	3	**45**	100	**2200 +400**
		2	4	**8**	100	
		5	5	**25**	100	
	Allied /**GE**	4	4	**16**	100	
	Open Electives /**AEE**	2	4	**8**	100	**200**
	Electives/**DSE**	4	4	**16**	100	**400**
Part IV	*Lang. (BCT/AT #)*	*2*	*1*	*2$*	*100*	***200*****
	EVS & EI / **AECC-III #**	2	1	2	100	**200****
	Job Oriented Course / Value Added Course	*3*	*1*	*3$*	-	-
	Skill Based/ PACE/ **SEC @**	3	1	3	100	**300****
	Life Skills / **SEC @**	2	2	4	100	**200****
	Self-Study Course / ***DSC***	*1*	*3*	*3$*	*100*	***100*****
	Internship/Institutional Training/Mini-Project (Summer Courses #)	*2*	*2*	*2$*	*100*	***200*****
Part V	@ Extension	1	1	1	100	**100****
	Total			**140 + (10Extra Credits)**		**3600 + (1300**)**

Note:

- **Four core courses are mandatory in MOOC Portal**
- **Minimum 20 and Maximum 24 Credit/Semester (except for VI Sem)**
- **VI Semester will have 12 To 16 Credit (Core/DSE Papers Only)**

List of Open Elective Papers	
Open Electives	Yoga for Human Excellence Human Health & Hygiene Indian Culture and Heritage Indian Constitution and Political System Consumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights& Gender Equality Disaster Management Green Farming Campus to Corporate How to start a Business? Research Methodology and IPR General Studies for Competitive Examinations IIT JAM Examination (for science only) CUCET Examination
	Multimedia Systems Ethical Hacking

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives / **DSE-I**	20ITE01	Computer Graphics and Visualization
	20ITE02	Linux Administration Level I
	20ITE03	Data Analytics and Business Intelligence
Electives / **DSE-II**	20ITE04	Linux Administration Level II
	20ITE05	Motion Graphics Pro
	20ITE06	Robotic Process Automation
Electives / **DSE-III**	20ITE07	Bioinformatics
	20ITE08	Digital Composting
	20ITE09	Block Chain Technologies
Electives / **DSE-IV**	20ITE10	Genetic Engineering
	20ITE11	Advanced Composting
	20ITE12	Cyber Security

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Member Secretary – Academic Council

SEMESTER I

COURSE CODE	COURSE NAME	CATE GORY	L	T	P	CREDIT	ASSESSMENT CODE
20CSC01	DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION	DSC	45	-	-	3	A

PREAMBLE / COURSEOBJECTIVE

This course aims at facilitating the students to understand and develop a strong foundation in number systems and Boolean functions. Analysis and design of Logic gates, combinational circuits and sequential circuits.
Explore the fundamentals of computer organization and relate the basic to the contemporary design issues.

DEPARTMENTOFFERING

BSc Computer Science

PREREQUISTE

Higher Secondary Level –Number system, memory management

Bridge Course – Yes, If not studied computer Science in HigherSecondary Level

EXPECTEDSKILL

Domain Knowledge

COURSEOUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Analyze the number system conversion.	Apply
CO2	Differentiate various codes and logic gates.	Remember
CO3	Identify the various components of computer system design.	Understand
CO4	Develop ability and confidence to handle I/O and memory organization.	Apply
CO5	Design combinational and sequential circuits.	Apply

SYLLABUS

UNIT I

09 HOURS

Digital Vs Analog signals - Number Systems: Binary – Octal – Decimal – Hexadecimal – Conversions of Number systems – Arithmetic operation: Binary addition – Binary subtraction – Binary multiplication – Binary Division – 1's and 2's Compliments addition – subtraction.

UNITII

09HOURS

Introduction to codes – Weighted codes – Non weighted codes – Binary codes – BCD codes – Excess 3 codes – Parity codes – Grey Codes – ASCII codes – Introduction to Logic Gates – Truth Tables – Universal Gates.

UNITIII

09 HOURS

Introduction: Boolean Algebraic Laws – Reducing Boolean expression – Karnaugh Map representation – Combinational circuits design procedures: Adders – Subtractor – Decoders – Encoders – Multiplexers – Demultiplexer - Sequential circuits design procedures: Latches - Flip Flop.

UNITIV

09 HOURS

Central processing unit-General register organization – Stack organization-Instruction formats. Pipeline processing: Pipelining – Arithmetic pipeline- Instruction pipeline-RISC pipeline

UNITV

09 HOURS

Input output organization – Input output interface. Memory organization – Memory hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory.

TEXTBOOKS

A. Anandkumar," Fundamentals of Digital Circuits", PHI, New Delhi, 4th Edition,2016.
B. M. Morris Mano, "Computer system Architecture ", Revised 3rd edition, PHI Pub.,2017.

REFERENCEBOOKS

A. M.Morris Mano, "Digital Logic Computer Design", Pearson Education, 5th Edition, 2013.
B. Donald P Leach, Albert Paul Malvino, Goutam Saha, "Digital Principles and Applications", Tata McGraw-Hill, 7th Edition, 2011.
C. John P Hayes, "Computer Architecture and Organization", Tata McGraw Hill Pub. (P) Ltd. 3rd Edition 2004.

WEBRESOURCES

Ahttps://www.tutorialspoint.com/computer_logical_organization/binary_codes.htm

B https://www.studytonight.com/computer-architecture/pipelining

C https://www.geeksforgeeks.org/cache-memory-in-computer-organization

MAPPING WITH PROGRAMOUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	L	-	-	-
CO2	S	-	-	M	-	-	-
CO3	S	-	-	L	-	-	-
CO4	-	M	-	M	-	-	-
CO5	M	S	-	-	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared By

(Dr Kavitha P)
Course Co-ordinator

Verified by

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Dean, School of Computing

Approved by

(Dr Maria Priscilla G)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20UIT11	Analog& Digital Electronics	DSC	20		30	3	B

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to identify the fundamental components of analog electronics,recognize digital electronics fundamentals and recognize the knowledge of using analog/digital trainer kits.

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level - Basic computer knowledge

Bridge Course – If not studied in Higher Secondary Level

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Apply basic knowledge of Analog and Digital Electronics	Remember
CO2	Analyze the Number System conversion	Analyze
CO3	Handling the Various testing tools for Analog and Digital Electronics	Apply
CO4	Analyze the various electric network by using theorems	Analyze

SYLLABUS

UNIT-IAnalog Electronics: **10 hrs**

Soldering-Ohm's law –Power – using multimeter – Diode –Transformer – using of Oscilloscope – Transistor.

UNIT-II Digital Electronics: **10 hrs**

Binary number system - Hexa Number system - Octal Number system –Basic Logic Gates – Universal Gates-EX-OR,EX-NOR- Flip Flops – Shift Register –Counter IC 555.

UNIT-III Practical session: **10 hrs**

Analog and Digital Signals – Variable power supplies – frequency generator – Bread board – Sine/square/triangular wave generator –Verification of Ohms Law – V_I characteristics of Diode – Half wave Rectification – Full wave Rectification

UNIT-IV Practical session: **10 hrs**

Study of Microprocessor – Digital multimeter – Analog Oscilloscope –Digital oscilloscope –soldering iron – Desoldering pump - Analysis and synthesis of Boolean Expression of basic logic gates - Analysis and synthesis of sequential circuit using Flip Flops- Measurement of Amplitude, Frequency using CRO and Function generator.

UNIT-V Practical session: **10 hrs**

Resistor in series – Resistor in Parallel – capacitor in series – capacitor in parallel -Nortons theorem –Thevenin's theorem –Millman's theorem –Superpositions theorem - Maximum power transfer theorem.

TEXT BOOKS

1.U. A. Bakshi, A. P. Godse, *Analog& Digital Electronics*, Technical Publication.

REFERENCE BOOKS

A.Sanjay Sharma, Analog& *Digital Electronics*, S. K. Kataria&Sons.

B.Nagrath,*Electronics - Analog and Digital*, 2nd Edition, PHI Learning Pvt.Ltd.

WEB RESOURCES

A. https://neurophysics.ucsd.edu/courses/physics_120/Agarwal%20and%20Lang%20(2005)%20Foundations%20of%20Analog%20and%20Digital.pdf
B. https://profs.basu.ac.ir/y-seifi/upload_file/database%20system%20concepts-6th%20edition(pre_co_prj.2572.645).pdf
C. https://sites.google.com/site/drvumadevi/teaching/previous_courses/dbms-jan-2016

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	-	-	S	-	-	-
CO2	S	-	-	M	-	-	-
CO3	M	S	-	M	-	-	-
CO4	M	S	-	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

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Approved by

(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ITC01	Programming in C	DSC	55	-	-	4	A

PREAMBLE / COURSE OBJECTIVE

- To learn strategies to solve a problems using algorithms and flowcharts
- To enable students to learn about the basic features of C Programming Language
- To learn the various decision making and looping statements
- To learn how to program using arrays, strings and functions
- To learn about structures and pointers
- To learn file management in C

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level –Basic computerknowledge

Bridge Course – YES(Non computer science students)

EXPECTED SKILL

Domain Knowledge / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Demonstratethe basics of programming concepts	Remember
CO2	Apply appropriate data types and control structures for solving a given problem.	Apply
CO3	Illustrate the representation of arrays, strings and usage of string operations.	Understand
CO4	Illustrate functions and use structures for solving problems	Apply
CO5	Apply the knowledge of pointers and dynamic memory allocation	Apply
CO6	Implement file handling mechanism.	Apply

SYLLABUS

UNIT I — 11 HOURS

Introduction: Computer Algorithms – Developing Algorithms – Flowcharts. Overview of C: History – Importance and applications –Sample programs- Structure of a C Program. Constants, Variables and Data Types: Character set - C Tokens – Constants, Variables and Data Types. Operators and Expressions: Arithmetic Operator – Relational Operator – Logical Operator – Assignment Operator – Increment and Decrement Operator – Conditional Operator – Bitwise Operator – Special Operator – Arithmetic Expressions - Evaluation of Expressions – Precedence of Arithmetic Operators.

UNIT II — 11 HOURS

Managing Input and Output Operations: Reading and Writing a Character – Formatted input and Output. Decision making and Branching: Decision Making with IF – Simple IF – The IF…ELSE Statement – Nesting of IF….ELSE Statements – ELSE IF Ladder – Switch Statement - ?: Statement – GOTO Statement. Decision Making and Looping: While Statement – DO Statement – FOR Statement.

UNIT III — 11 HOURS

Arrays: Introduction – Declaring and Initializing One Dimensional Array – Declaring and Initializing of Two Dimensional Arrays – Multidimensional Arrays. Character Arrays and Strings: Declaring and Initializing String Variable – Reading Strings from Terminals – Writing String to Screen – Arithmetic Operation on Characters – Putting Strings together – Comparison of two Strings – String Handling Functions.

UNIT IV — 11 HOURS

User Defined functions: Elements of User Defined Function – Definition of Function – Return Values and Types – Function Call and Declaration - Category of Functions – Recursion – Scope and lifetime of variables in functions. Structures and Unions: Definition of Structure – Declaring Structure Variable – Accessing Structure Member – Structure Initializing – Copying and Comparing Structure Variable – Operation on individual Member – Arrays of Structure – Arrays within Structure - Structure within Structure – Structures and Function – Unions.

UNIT V — 11 HOURS

Pointers: Understanding Pointers – Accessing the Address of the Variable – Declaring and initializing pointer variable – Accessing Pointer Variable – Pointers and arrays – Pointers and structures - Pointers and Character strings. File Management in C: Defining and Opening the File – Closing a File – I/O Operation on File.

TEXT BOOKS

1. V. Rajaraman, *Computer Programming in C,* PHI, 2009.
2. E. Balagurusamy, *Programming in ANSI C,*7thEd., Tata McGraw - Hill Publications ,2017.
   Unit I: Text 1: Ch-1,2 Text 2:Ch-1,2,3 Unit II: Text 2:Ch-4,5,6 Unit III: Text 2:Ch-7,8
   Unit IV: Text 2:Ch-9,10Unit III: Text 2:Ch-11,12

REFERENCE BOOKS

1. YashavantKanetkar,*Let us C,* 15th Ed., BPB Publications, 2016.
2. Gottfried, *Programming with C,* 3rdEd.,TMH Publications,2017.

WEB RESOURCES

1. https://www.w3schools.in/c-tutorial/
2. https://www.tutorialspoint.com/cprogramming/index.htm

MAPPING WITH PROGRAM OUTCOMES

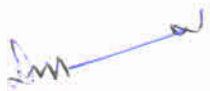
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	L	-	-	-
CO2	S	M	-	-	-	-	-
CO3	-	M	-	M	-	-	-
CO4	-	M	-	M	-	-	-
CO5	-	M	-	M	-	-	-
CO6	-	M	L	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by



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Approved by

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BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20UIT12	Networking and Data Communication	DSC	20		30	4	B

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to understand the various use of networks, recognize the types of networks. The course helps the students to assess the fundamental of OSI model, the network technologies and the devices types, protocols used andthe knowledge of using Networking & Data Communication

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level – Basic computer knowledge

Bridge Course – If not studied in Higher Secondary Level

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the use of networks and recognize the types of networks	Remember
CO2	Analyze the OSImodel and TCP/IPmodel	Analyze
CO3	Illustrate Crimping, Network Tools and Trouble Shooting	Apply
CO4	Identify the networking tools and troubleshootingmethods	Understand
CO5	Illustrate network trouble Shooting	Apply

SYLLABUS

UNIT I

10 HOURS

Networking Fundamentals -Terminologies Client, Server, Topology, Technology -Types of Network – Hierarchical Central Computer, Peer to Peer Network, Client Server Network - Types of Network Topologies - Types of Network Technologies -Types of Data passing Schemes

Practical for Computer Hardware Topics

UNIT II

10 HOURS

Network Components - Types of Cablings -Coaxial, UTP, STP, FOC-Types of Connectors - RJ-45, Terminator, T-Connector, BNC -Define HUB, Switch, Router -**Networking Concepts** -Explaining of Networking Concepts - Recognizing of OSI model -Recognizing of TCP/IP model-Identify the types devices -Identify the Protocols used

UNIT III

10 HOURS

Practical Crimping and Network Tools and Trouble Shooting

Crimping of the network cable and the colour code used

UNIT IV

10 HOURS

Practical Crimping and Network Tools and Trouble Shooting

Configuration of Network Adaptor

UNIT V

10 HOURS

Practical Crimping and Network Tools and Trouble Shooting

Using of Network Utilities.

TEXT BOOKS

1. Behrouz A Forouzan,*Data Communications and Networking,* 4th Edition, McGraw Hill Education (India) PvtLtd.
2. Andrew S.Tanenbaum, *ComputerNetworks,* 4thEdition,Pearson.

REFERENCE BOOKS

A. P. K. Sinha&PritiSinha, *Computer Fundamentals*, BPB Publications, 1992.
B. V. Raja Raman, *Introduction to Computers*, PHI.
C. Alex Leon & Mathews Leon, *Introduction to Computers*, Vikas Publishing House, 1999.
D. Vikas Gupta, *Comdex Computer Kit*, Wiley Dreamtech, Delhi, 2004.

WEB RESOURCES

A. http://widi.lecturer.pens.ac.id/Teori/Komunikasi%20Data/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	M	L	-	S	-	-	-
CO3	S	M	-	M	-	-	-
CO4	M	-	-	S	-	-	-
CO5	M	M	-	S	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

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Verified by

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Approved by

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(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ITC02	C Programming and Bio Computing Lab	DSC	-	-	33	3	A

PREAMBLE / COURSE OBJECTIVE

- To be familiar with programming in C Language
- To gain knowledge in using decision making and looping statements
- To understand simple programs using arrays, strings and functions
- To acquire knowledge in structures, pointers and file management
- To understand basics of Bio - Computing

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level –Basic computer knowledge

EXPECTED SKILL

Domain Knowledge / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Apply the basic programming concepts	Remember
CO2	IllustrateC programs using control structures, arrays and functions	Apply
CO3	Implement programs using pointers and file concepts	Apply
CO4	Apply C programming constructs to perform Bio – Computing concepts	Apply

SYLLABUS

1. Implement various Operators
2. Illustrate the concept to manage various formatted input output operations in C
3. Implement Decision making and branching statements
4. Implement Looping statements
5. Implement a C program to find complementary of DNA sequence using the concept of Arrays
6. Implement Character arrays and Strings
7. Implement User defined function
8. Implement the concept of Structures
9. Implement DNA codon table in C using pointers
10. Illustrate Counting DNA nucleotides in C using the concept of files

***Basics of Bio - Computing is imparted to students in lab hours**

TEXT BOOKS

1. V. Rajaraman, Computer Programming in C, PHI, 2009.
2. E. Balagurusamy, Programming in ANSI C,7thEd., Tata McGraw - Hill Publications, 2017.

REFERENCE BOOKS

3. YashavantKanetkar,*Let us C,* 15th Ed., BPB Publications, 2016.
4. Gottfried, *Programming with C,* 3rdEd.,TMH Publications,2017.

WEB RESOURCES

1. https://www.w3schools.in/c-tutorial/
2. https://www.tutorialspoint.com/cprogramming/index.html

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	-	-	-	-
CO2	M	M	-	M	-	-	-
CO3	M	M	-	M	-	-	-
CO4	M	M	M	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

(Dr Deepa C)
Course Co-ordinator

Verified by

(Dr Anna Saro Vijendran)
Dean, School of Computing

Approved by

(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20UIT13	PC Fundamentals (Computer Architecture and Peripherals)	DSC	20		30	3	B

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students to understand the various Computer Peripherals, their organization and operations. The course helps the students to assess the applicability of Identify the fundamental components of motherboard layout, components and form factors.Generation of CPUs and different CPU technology and the knowledge of using PC Fundamental (Computer Architecture & Peripherals)

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level – Basic computer knowledge

Bridge Course – If not studied in Higher Secondary Level

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify the basic types of input devices and output devices	Remember
CO2	Understandthe motherboard layout, components and form factors	Understand
CO3	Recognize the generation of CPUs and different CPU technology	Analyze
CO4	Analyze the memory form factors, slot types and memory types	Analyze
CO5	Identify the basic types of buses and bus speed, power supply unit	Remember

SYLLABUS

UNIT I

10 HOURS

Processors -Definitions of processor, Bus speed,-Study & Identifications of 8086, 80286, 80386, 80486 P I, P II, P III , I3, I5-Study & Identification of different Processor Sockets **Mother Board-**Study & Identification of I/O Slots-Study & Identification of BIOS-Study & Identification of I/O Ports-Study & Identification of FDC & IDE Channels- **Display Cards-I/O Cards**

Practical for Computer Hardware Topics

UNIT II

10 HOURS

Study & Identification & testing of RAM -Different types of RAM-EDO , FAST-PAGE, SDRAM, RDRAM- Study & Identification of different slots of RAM- CMOS Setup -Study of Different types of BIOS-Flash BIOS – Study of Functioning of BIOS-Configuring of different devices through CMOS

Practical for Computer Hardware Topics

UNIT III

10 HOURS

Installation & Configuration of HDD -Monitors – Mono &Colour-Study of Monochrome Monitor Tracing of Monochrome Monitor-Voltage Measurement of Monochrome Monitor-Troubleshooting of Monochrome Monitor-Study of Color Monitor-Tracing of Color Monitor-Voltage Measurement of Color Monitor-Troubleshooting of Color Monitor-**SMPS** -Study of Linear Power Supply-Study of Switch Mode Power Supply-Parts Identification of SMPS-Tracing of SMPS-Voltage Measurements of SMPS Troubleshooting of SMPS

Practical for Computer Hardware Topics

UNIT IV

10 HOURS

Assembling of a PC -Mounting of the Motherboard-Connecting the different Ports & Connectors of FDD & IDE - Inserting the different I/O cards on the Motherboard - Connecting the SMPS to the Motherboard

Practical for Computer Hardware Topics

UNIT V

10 HOURS

PC Trouble Shooting - Different Error signals generated by BIOS -Problems in PC due to the Display Cards Problems in PC due to the cables & connectors

Practical for Computer Hardware Topics

TEXT BOOKS

1.PradeepSinha,PritiSinha,*Computer Fundamentals,* 6th Edition, BPB publications.
2.J.L.Hennessy, *Computer Architecture: A Quantitative Approach,* 5th Edition, ElsevierPublications.

REFERENCE BOOKS

A.P. K. Sinha&PritiSinha, *Computer Fundamentals*, BPB Publications, 1992.
B. V. Raja Raman, *Introduction to Computers*, PHI.
C. Alex Leon & Mathews Leon, *Introduction to Computers*, Vikas Publishing House, 1999.
D. Vikas Gupta, *Comdex Computer Kit*, Wiley Dreamtech, Delhi, 2004.

WEB RESOURCES

A. http://mycsvtunotes.weebly.com/uploads/1/0/1/7/10174835/computer_fundamental_complete-i.pdf
B. https://drive.google.com/file/d/0Bwv926_8gSqwVTNIUEdzaklPVU0/view

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	S	-	-	M	-	-	-
CO3	S	-	-	M	L	-	-
CO4	S	-	-	S	-	-	-
CO5	S	-	-	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by

(Mr Arvind Govindraj)
Regional Head
UTL Technologies, Bangalore

Verified by

(Dr Anna Saro Vijendran)
Dean, School of Computing

Approved by

(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20MATCG13	MATHEMATICS FOR COMPUTING - I	GE	55	-	-	4	A(THEORY)

PREAMBLE / COURSE OBJECTIVE

To enable the students to learn and visualize the fundamental ideas about Mathematical Logic , Relation and Functions, Matrices, Differentiation and Integration.

DEPARTMENT OFFERING

PG & Research Department of Mathematics

PREREQUISTE

Higher Secondary Level –Logic , Relation and Functions, Matrices, Differentiation and Integration.

EXPECTED SKILL

Domain Knowledge ,Skill Development

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Acquire knowledge about Mathematical logic to validate a given statement.	Understand
CO2	Analyze the fundamental ideas of relations and functions.	Analyze
CO3	Analyze the properties of Matrices and their Applications	Analyze
CO4	Determine the derivative of the given function.	Apply
CO5	Evaluate the integration for the given function.	Apply

SYLLABUS

UNIT I **10 HOURS**

Connectives - Well – Formed Formulae - Equivalence of formulas - Tautological implications - Duality Law - Normal Forms - Theory of Inference.

UNIT II **11 HOURS**

Composition of Relations-Equivalence Relations- Partial Ordering Relation- Composition of Functions, Inverse Functions - One –to –One - Onto and Bijective Functions.

UNIT III **11 HOURS**

Types of Matrices – Matrix Operations – Canonical Forms – Inverse of a Matrix – Geometric Properties of Plane Linear Transformation – Rank and Nullity – Linear systems and Matrices.

UNIT IV **12 HOURS**

Functions and Limits – Differentiation – Successive Differentiation – Partial Differentiation – Maxima and Minima.

UNIT V **11 HOURS**

Integration – Definite Integrals – Reduction Formulae – Geometric Applications of Integration.

TEXT BOOKS

A. J.K.Sharma , "Discrete Mathematics" -Trinity Press - An imprint of LaxmiPublications PvtLtd, 4th Edition, Reprint 2015.(For Unit I,II)

B. U.Rizwan, "Mathematical Fountations" , Scitech Publications (India) Pvt.Ltd., 1st Edition , Reprint 2007. (For Unit III, IV , V)

REFERENCE BOOKS

A. Dr.M.K. Venkataraman, Dr.N. Sridharan, N. Chandrasekaran "Discrete Mathematics"National Publishing Company, 1st edition 2000, Reprint 2012.

B. P.Kandasamy and K.Thilagavathy, "Mathematics for B.Sc. Branch I-Vol-I" , S.Chand and
Company Ltd, New Delhi, Ist Edition 2004, Reprint 2014.

C. Dr G.Balaji , "Engineering Mathematics-I" – Boss Computers & Prints-G.BalajiPublishers , 4th Edition, Reprint 2016. (For Unit III).

WEB RESOURCES

A. https://www.google.com/search?rlz=1C1AVNG_enIN623IN623&q=introduction+to+differential+calculus+-+ppt&sa=X&ved=2ahUKEwjN4sHrz-LpAhX3yTgGHQXfCtUQ1QIoBHoECAwQBQ

B. http://www.math.nagoya-u.ac.jp/~richard/teaching/f2016/BasicCalculus.pdf

C. http://www.pbte.edu.pk/text%20books/dae/math_113/Chapter_09.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	L	-	L	-	-	-
CO2	S	L	-	L	-	-	-
CO3	S	L	-	L	-	-	-
CO4	S	M	-	L	-	-	-
CO5	S	M	-	L	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

for

Prof MALARVIZHI M
(Course Coordinator)

Dr JAYASHEELA D
(Academic Council-Member Secretary)

Dr UMA N
(BOS Chairman)

SEMESTER I

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20EIA01	Entrepreneurship & Innovation	AECC-III	-	26	-	1#	Theory

PREAMBLE / COURSE OBJECTIVE

Students acquire the knowledge and skills needed to manage the development of innovations, to recognize and evaluate potential opportunities to monetize these innovations, to plan specific and detailed methods to exploit these opportunities, and to acquire the resources necessary to implement these plans. Topics include entrepreneurial thinking; innovation management; opportunity spotting and evaluation; industry and market research; business strategy; business models and business plans; financial forecasting and entrepreneurial finance; pitching to resource providers and negotiating deals; and launching new ventures.

DEPARTMENT OFFERING

International Business

PREREQUISTE

Higher secondary (+2 Pass).

EXPECTED SKILL

Interested to become an Entrepreneur / Innovator /Design thinker

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Think critically and creatively about the nature of business opportunities, resources, and industries.	Remember
CO2	Delineate the processes by which innovation is fostered, managed, and commercialized.	Understand
CO3	Effectively and efficiently evaluate the potential of new business opportunities.	Apply
CO4	Assess the market potential for a new venture, including customer need, competitors, and industry attractiveness.	Apply
CO5	Develop a business model for a new venture, including revenue, margins, operations, working capital, and investment.	Apply

SYLLABUS

Module No.	Topic	Total Hours
1.	Entrepreneurial Thinking	2
2.	Innovation Management	2
3.	Design Thinking	2
4.	Opportunity Spotting / Opportunity Evaluation	2
5.	Industry and Market Research	2
6.	Innovation Strategy and Business Models	2
7.	Financial Forecasting	2
8.	Business Plans/ Business Model Canvas	3
9.	Entrepreneurial Finance	2
10.	Pitching to Resource Providers / Pitch Deck	3
11.	Negotiating Deals	2
12.	New Venture Creation	2
	Total Hours	26

TEXT BOOKS

A. Arya Kumar "Entrepreneurship – Creating and leading an Entrepreneurial Organization", Pearson, Second Edition (2012).
B. Christopher Golis "Enterprise & Venture Capital", Allen &Unwin Publication, Fourth Edition (2007).
C. EmrahYayici "Design Thinking Methodology", Artbiztech, First Edition (2016).
D. Thomas Lock Wood & Edgar Papke "Innovation by Design", Career Press.com, Second Edition (2017).

REFERENCE BOOKS

A. Andrew J. Dubrin "Leadership – Research Findings, Practice & Skills", Biztantra Publishers, Fourth Edition (2007).
B. Jonathan Wilson "Essentials of Business Research", Sage Publication, First Edition (2010).

WEB RESOURCES

A. https://blog.forgeforward.in/tagged/startup-lessons
B. https://blog.forgeforward.in/tagged/entrepreneurship
C. https://blog.forgeforward.in/tagged/minimum-viable-product
D. https://blog.forgeforward.in/tagged/minimum-viable-product
E. https://blog.forgeforward.in/tagged/innovation
F. https://www.youtube.com/watch?v=8vdEyL7uKXs&list=PLmP9QrmTNPqBEvKbMSXvwlwn7fdnXe6Lw

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	M	M	-	-
CO2	-	-	L	M	-	-	-
CO3	-	-	-	L	M	-	-
CO4	-	-	-	M	L	-	-
CO5	-	S	-	-	L	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN

To Successfully Complete the course, Students must achieve a passing grade of 40% in the Comprehensive Internal Examination.

Extra Credit Course
*No Comprehensive Examination only Continuous Internal Assessment

Assessment Type	Topic	Marks
Assignment	Strategic Innovation	20
Group Discussion/ Presentation	Design Thinking	10
Objective Type	MCQ (CIA 1)	20
Assignment	Market Research	10
Group Discussion/ Presentation	Pitch Deck / Business Plan (Presentation)	20
Descriptive Type	Model Test (4 Questions * 5 Marks)	20
Total		100 Marks

Verified by
Dr D Santhanakrishnan

Approved by
Dr D Santhanakrishnan

Approved by

Member Secretary
Academic Council

SEMESTER 1

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20LSA01	Life Skills-I	SEC	-	40	-	2	A

PREAMBLE / COURSE OBJECTIVE

This course aims at enhancing the students self - confidence to speak in front of an audience, improve their self-awareness and overcome fear and insecurity and also help them realize their potential through various classroom practical activities.

DEPARTMENT OFFERING

PREREQUISITE

Higher Secondary Completion- Listening, Speaking, Reading and Writing skills

EXPECTED SKILL

Communication Skills and Professional Skills

COURSE OUTCOMES

On successful completion of the course, students will be able to-

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Introduce oneself and speak creatively	Remember
CO2	Listen and Read effectively	Understand
CO3	Write formal and informal mails	Apply
CO4	Maintain good postures, gestures and social distancing	Apply
CO5	Present effectively using tools	Apply

SYLLABUS

UNIT I

7 HOURS

Speaking Skills – Self Introduction, common mispronounced words – stress and intonation, impromptu speaking, two minute topics, storytelling, creative speaking – story completion, small talk, tongue twisters

UNIT II

7 HOURS

Listening skills and Reading Skills – Listening for gist, listening for main ideas, back to back interviews, TED talks, audio clip gap fill exercises, Reading skills – Reading for gist, reading for detail, reading comprehension, newspaper articles, vocabulary search

UNIT III

8 HOURS

Writing skills – email writing – formal vs informal emails, structure, useful expressions, situation based email writing practice, Effective use of social media –do's and don'ts, guidelines for effective usage of social media,

UNIT IV

9 HOURS

Non- verbal communication – gestures, posture, do's and don'ts of non- verbal communication, Social and cultural etiquette- how to behave in public, respect others privacy, social distancing, Trust and collaboration

UNIT V

9 HOURS

Presentation Skills–identifying the audience, analyzing content, creating content, signposting, tone, language, posture, getting audience attention, practice methods, usage of presentations tools, handling questions, Brainstorming – putting ideas together, making notes, selecting relevant ideas, Listening as a team skills - coordinated listening, note taking, identifying main ideas,

TEXT BOOKS

A. Service provider adapted text book and study materials

REFERENCE BOOKS

A. New English File – Clive Oxenden, Christina Latham- Koenig, Paul Seligson 3rd Edition
B. New Headway –Liz and John Soars – 4th Edition
C. Business Result – David Grant, Jane Hudson & Robert McLarty 1st Edition

WEB RESOURCES

A. https://busyteacher.org/
B. https://en.islcollective.com/
C. https://www.skillsyouneed.com/presentation-skills.html
D. https://www.englishclub.com/grammar/

E. https://www.mindtools.com/CommSkll/PublicSpeaking.htm

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	S	-	M	-	-
CO2	-	-	M	S	-	-	-
CO3	-	-	S	-	M	-	-
CO4	-	-	M	-	S	-	-
CO5	-	-	-	L	S	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Verified by
Dr T Nagaprakash

Approved by
Dr T Nagaprakash

Approved by

Member Secretary
Academic Council

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CACP01	DATA STRUCTURES AND LAB USING C	DSC	45	-	30	5	A

PREAMBLE / COURSE OBJECTIVE

This course aims at facilitating the students should be able to

- Understand the basic data structures and importance of data structures in computer programs.
- Learn the key difference between various data structures like Stack, Queue, Circular Queue and its applications.
- Learn about various Linked Lists and its Applications.
- Apply the basic terminologies of Trees, Binary Trees and Graphs.
- Analyze about the file organizations and its applications.

DEPARTMENT OFFERING

BCA – Department of Computer Applications

PREREQUISTE

First Semester – Knowledge in C Programming Language and Logical Skills

EXPECTED SKILL

Domain Knowledge / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Articulate the knowledge of basic data structures, its classifications and its importance in computer programs.	Remember
CO2	Examine the various operations of different data structures in real world problems.	Understand
CO3	Analyze the various linked list applications in the real world problems.	Apply
CO4	Design and apply trees and graphs concepts in the real world applications.	Apply
CO5	Design and implement suitable file organizations and the appropriate searching/sorting algorithms in real time applications	Advanced

SYLLABUS

UNIT I **8 Hours**

Introduction: Definition, Structure and properties of algorithms, Development of an algorithm, Data Structures and Algorithms, Data Structure - Definition and Classification. **Arrays:** Introduction, Array operations, Number of elements in an array, Representations of arrays in memory, applications.

UNIT II **10 Hours**

Stacks: Introduction -Stack Operations - Stack implementations- **Applications:** Recursive Programming – Evaluations of Expressions. **Queues:** Introduction – Queue Operations – Queue implementations - Limitations of Linear Queue. **Circular Queues:** Operations on a Circular Queue – implementations of insertion and deletion in a Circular Queue - Other types of queues Priority Queues - Deque. **Applications** of Linear queue – **Applications** of Priority Queue.

UNIT III **10 Hours**

Linked Lists : Drawbacks of sequential data structure – Merits of Linked data structures. **Singly Linked List**:- Representations - Insertion and Deletion in a singly Linked Lists. **Circular Linked lists**: Representations – Advantages of Circular Linked lists Over singly Linked Lists - Disadvantages of Circularly Linked Lists – Primitive Operations on Circular Linked lists. **Doubly linked lists** : Representations – Advantages and Disadvantages of Doubly Linked lists - Operations on Doubly Linked lists. **Applications**: Addition of Polynomials.

UNIT IV **8 Hours**

Trees: Introduction, Trees-basic terminologies, Representation of Trees. **Binary Trees:** Basic terminologies and types, representation of Binary Trees, Binary tree Traversals, Threaded Binary Trees, Applications. **Graphs:** Introduction, Definition and basic terminologies

UNIT V **9 Hours**

File organizations; Introduction, Files, Keys, Basic File Operations. Sequential File Organizations, Indexed Sequential File Organizations, Direct File Organizations. **Searching** : Linear search, Binary search. **Sorting**: Merge sort and Quick sort.

Total Periods: Theory 45 Hrs

Practical Lab Exercises

1. Create and implement a stack and perform its operations using array
2. Create and implement a queue and perform its operations using array
3. Design and implement linked list and its operations
4. Design and implement doubly linked list and its operations
5. Implementation of Binary Trees and operations of Binary Trees
6. Design and develop Graph representation and Traversal algorithms
7. Demonstrate linear searching technique
8. Examine to search an element in an array using binary search
9. Develop a code to sort the given numbers using Merge Sort Technique
10. Sort the given numbers using Quick Sort Technique

Practical: 30 Hours

EVALUATION PATTERN

CIA – 40 Marks	CE- 60 Marks (Theory)
• CIA- Model (Theory) – 10 Marks • Practical Lab Exercises (10 Marks for each Program to be assessed and Average marks of all programs to be converted to 30 marks) - 30 Marks	

TEXT BOOKS

A. G A V PAI" Data Structures and Algorithms-Concepts, Techniques and Applications"- TATA McGRAW HILL, Reprint -2017

REFERENCE BOOKS

1. Ellis Horowitz & Sartaj Sahni "Fundamentals of Data Structures"- Galgotia Publications, 2008.
2. Jean Paul Tremblay, Paul G. Sorenson "An Introduction to Data Structures with Applications"- Second Edition, Tata Mcgraw Hill. 2008

WEB RESOURCES

A. https://www.scribd.com/doc/152191044/Fundamentals-of-Data-Structures-Ellis-Horowitz-Sartaj-Sahni-pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	S	S	-	M	-	-	-
CO3	S	S	-	M	-	-	-
CO4	S	S	-	M	-	-	-
CO5	S	S	-	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
Dr.S.Thavamani
Course Co-ordinator

Verified by
Dr.Anna Saro Vijendran
Dean- School of Computing

Approved by
Dr.D.Hari Prasad
BOS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20UIT21	A+ - HARDWARE ESSENTIAL	DSC	55	-	-	5	A

PREAMBLE / COURSE OBJECTIVE

- Install and configure expansion cards
- Install and configure storage devices and use appropriate media
- Differentiate between motherboard components, their purposes, and properties
- Knowledge of dealing with prohibited content/activity
- Knowledge on safety measures and operational procedures

DEPARTMENT OFFERING

BScInformation Technology

PREREQUISTE

Higher Secondary Level –Basic Computer Knowledge

EXPECTED SKILL

Domain Knowledge / Entrepreneurship / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Acquire the basic knowledge of computer hardware components and devices.	Remember
CO2	Demonstrate about troubleshoot PC and establish the network connections using TCP/IP and SOHO	Understand
CO3	Solve network issues and analyze security vulnerabilities for various network connections.	Apply
CO4	Adopt basics safety procedures and configure laptops and mobile devices.	Apply

SYLLABUS

UNIT I

11 HOURS

HARDWARE - Identifying, using, and connecting hardware components and devices-windows operating Systems- Install and support Windows OS including command line & client support.

UNIT II **11 HOURS**

SOFTWARE TROUBLESHOOTING - Troubleshoot PC and mobile device issues including application security support -**Networking** - Explain types of networks and connections including TCP/IP, WIFI and SOHO.

UNIT III **11 HOURS**

HARDWARE & NETWORK TROUBLESHOOTING -Troubleshoot device and network issues.
Security -Identify and protect against security vulnerabilities for devices and their network connections.

UNIT IV **11 HOURS**

MOBILE DEVICES - Install & configure laptops and other mobile devices-Other OS & Technologies-Understand Mac OS, Linux and mobile OS.

UNIT V **11 HOURS**

OPERATIONAL PROCEDURES - Follow best practices for safety, environmental impacts, and communication and professionalism.

REFERENCE BOOKS

A. Quentin Docter , Emmett Dulaney, Toby Skandier, "CompTIA A+ Complete Study Guide: Exams 220-901 and 220-902", 3rd Edition, Sybex Wiley Publication, 2015.

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	-	-	S	-	-	-
CO2	M	-	-	S	-	-	-
CO3	M	-	-	S	-	-	-
CO4	M	-	-	S	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
(Mr AravindGovindraj)
Regional Technical Head
UTL Technologies, Bangalore

Verified by
(Dr Anna SaroVijendran)
Dean, School of Computing

Approved by
(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20CSCP01	JAVAPROGRAMMING WITH BIO-PERL LAB	DSC		45	30	5	A

PREAMBLE / COURSEOBJECTIVE

- To introduce the fundamentals of java programming language with oops concepts and provide knowledge about Java programming constructs
- To learn the basic concepts of Classes, Objects, Arrays and Inheritance
- To inculcate Interface, Package, String and Exception handling concepts
- To gain knowledge about Swing and File Management
- Gain the knowledge on Perl and BioPerl concepts

DEPARTMENTOFFERING

BSc Computer Science

PREREQUISTE

Higher Secondary Level - Basic computerknowledge

Bridge Course – NIL

EXPECTEDSKILL

Domain Knowledge / Employability / Skill Development

COURSEOUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the fundamental concepts of Java Programming Language.(L1)	Remember
CO2	Implement the concepts of Array, Inheritance and Interface concepts in Java. (L2)	Apply
CO3	Apply the concepts of Package, String, Exception Handling and Multithreading in Java. (L2)	Understand
CO4	Demonstrate Swing and File handling using Java. (L3)	Apply
CO5	Analyze all fundamental elements of Perl programming. (L2)	Apply

SYLLABUS

UNIT I **15HOURS**

Java Evolution: Java History- Java Features- How Java differs from C and C++- Java Environment- Fundamentals of Object Oriented Programming.**Overview of Java Language:** Simple Java Program- Java program structures- Java Tokens- Java Statements- Java Virtual Machine- **Constants, Variables and Datatypes**: Constants- Variables- Datatypes – Scope of variables- Type casting. **Operators and Expressions**: Type conversions in Expressions- Operator Precedence and Associativity. **Decision Making and Branching**: Decision making with If statement- The switch statement. **Decision Making and Looping**: while statement- for statement – do statement. – Arrays – Strings

Practical Lab Exercise:

1.Implement String handling functions.

UNIT II **15HOURS**

Fundamentals of Object-Oriented Programming: Basic concepts of Object Oriented Programming. **Classes, objects and methods:** Defining a class- Fields declaration- Methods declaration – creating objects- accessing class members- constructors- method overloading- static members- nesting of methods- Inheritance: Extending class- overriding methods- final variables and methods- Final classes – Finalizer methods- Abstract method and classes – methods with varargs- visibility control.**Interfaces: Multiple Inheritance :**Defining Interfaces- Extending Interfaces- Implementing Interfaces- Accessing Interface variables.

Practical Lab Exercise:

2.Implement Class mechanism.

3.Illustrate the concept of Method Overloading and Constructor Overloading.

4.Implement various forms of Inheritance and Method Overriding Concept.

5.Illustrate the Interface Concept.

UNIT III **15HOURS**

Packages: Java API Packages- Using System Packages – Creating Packages- Accessing a package- Using a Package- Adding a class to a Package- Hiding Classes- Static Import. **Multithreaded Programming:** Creating Threads- Extending the Thread Class- Lifecycle of a Thread- Using Thread Methods- Thread Priority- Synchronization- Implementing the Runnable Interface. **Managing Errors and Exceptions**: Types of Errors- Exceptions – Syntax of Exception Handling Code- Multiple catch statements – Using Finally statement- Throwing our own Exceptions.

Practical Lab Exercise:

6.Illustrate the following Exceptions.

(a) Null Pointer Exception (b) Arithmetic exception (c) I/O exception

(d) Array Index Out of Bounds exception without using throws exception class.

7.Implement the Multithreading concept

UNIT IV **15HOURS**

Graphics Programming Using AWT, Swing and Layout Manager: Introduction – The Graphics Class- Introduction to AWT Package- Windows Fundamentals- Closing an AWT Window or Frame- Layout Managers- Handling Events on AWT Components- Introduction to Swing Package – Components and Containers- AWT versus Swing. **Managing Input/Output Files in Java**: Introduction – Concepts of Streans- Stream Classes- Byte Strean Classes- Character Stream Classes.

Practical Lab Exercise:

8.Implement the Collection Class.

UNIT V **15HOURS**

The Perl Language: Names- Variables- Values- Unicode and Strings – Control Flow- Scalars- Arrays- Operators- Functions: Declaring and invoking functions- Function parameters- Functions and Namespaces – Regular Expressions and Matching – Files- Input and Output. **Introduction to BioPerl**- Creating a sequence and objects – writing a sequence to a file- retrieving a sequence from a file

Practical Lab Exercise:

9.Implement DNA Sequence Generation.

10.Implement Protein Sequence Generation.

TEXTBOOKS

1. E. Balagurusamy, "Programming with JAVA – A PRIMER", 6th Edition, McGraw-Hill, 2019
2. Chromatic, "Modern Perl", 4th Edition, Onyx Neon Press, 2016

REFERENCEBOOKS

1. SachinMalhotra and SaurabhChoudhary", Programming in Java" Revised 2nd Edition, Oxford Publication
2. Patrick Naughton& Hebert Schildt , "The Complete Reference JAVA 2", 3rd edition ,TMH
3. Dr. DSVGK Kaladha, "Basics of Perl and BioPerl", Publisher: GRIN Publishing 2014.

WEBRESOURCES

1. https://bioperl.org/howtos/Beginners_HOWTO.html

MAPPING WITH PROGRAMOUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	-	-	-	-
CO2	S	S	-	L	-	-	-
CO3	S	S	-	L	-	-	-
CO4	S	S	-	L	-	-	-
CO5	S	S	-	L	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
(Prof Arthi R)

Verified by
(Dr Anna SaroVijendran)

Approved by
(Dr Maria Priscilla G)

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20UIT22	Operating Systems	DSC	55	-	-	5	A

PREAMBLE / COURSE OBJECTIVE

- Identify the fundamental concepts of operating system
- Recognize of process and memory management in operating system
- Recognize the knowledge of input/output, security in operating system

DEPARTMENT OFFERING

BScInformation Technology

PREREQUISTE

Higher Secondary Level –Basic Computer Knowledge

EXPECTED SKILL

Domain Knowledge / Employability

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Acquire knowledge on basic concepts of Operating systems.	Remember
CO2	Adequate knowledge about Threads, Concurrency and Deadlock.	Understand
CO3	Analyze memory management and virtual memory for an operating system.	Apply
CO4	Analyze each type of I/O Devices, File systems and Security.	Apply

SYLLABUS

UNIT I **11 HOURS**

Introduction to Operating Systems -Introduction to hardware support for operating systems: privileged mode execution, saving and restoring CPU state, traps and interrupts, timers, memory protection. Operating system techniques for protecting user and hardware resources. Overview of the key operating system abstractions and the use of system calls to manipulate them.

The Process Concept - Complete the overview of the key operating system abstractions and the use of system calls to manipulate them. Program execution, the process concept, process-related state, the process table, saving and restoring process state, the role of the scheduler.

Practical with Linux

- Basic Unix Commands.
- Fork System call.

UNIT II **11 HOURS**

Threads and Concurrency-Threads, process context switch vs thread switch, true concurrency vs pseudo concurrency, operating systems as concurrent programs, concurrency through multi-threading, concurrency through interrupt handling, concurrent access to shared memory, race conditions, mutual exclusion, synchronization primitives based on atomic instructions. Synchronization Primitives -Atomic instructions, locks, spinlocks, mutex semaphores, counting semaphores, and their use in solutions to Producer Consumer synchronization.

Classic Synchronization Problems-Classic synchronization problems: Producer Consumer, Philosophers, Readers and Writers, Sleeping Barber - Monitors and Message Passing.

Practical with Linux

- Semaphore Implementation.
- Sleeping Barber Problem.

UNIT III **11 HOURS**

Deadlock -Deadlock, livelock, deadlock detection, avoidance, and prevention. **Scheduling** - Separation of policy from mechanism, scheduling mechanisms, pre-emptive non-pre-emptive scheduling, example scheduling policies, FIFO, round-robin, shortest job first, priority scheduling, Unix-style feedback scheduling, proportional share scheduling, lottery scheduling.

Memory Management - Memory addresses and binding, static and dynamic addresses translation, address translation using base and limit registers, memory management algorithms using linked lists and bitmaps, external and internal fragmentation, paged virtual memory.

Practical with Linux

- FCFS Scheduling.
- Banker's algorithm for deadlock avoidance.

UNIT IV **11 HOURS**

Virtual Memory - Physical address spaces, virtual address spaces, page table design, single-level and multi-level page tables, hardware support for dynamic address translation using a TLB, hardware and software managed TLB refill. Inverted page tables, the memory hierarchy, TLB miss faults, segmentation faults, protection faults, page faults, hardware support for memory protection, segmentation. Implementation issues, page sharing, copy-on-write, page fault handling, segmentation, segmentation with paging. **Paging Algorithms** - Demand paging, swapping, placement and replacement algorithms, memory hierarchy revisited, overview of cache architecture, performance modelling for memory management systems.

Practical with Linux

- Best Fit allocation.
- FIFO Page Replacement.

UNIT V **11 HOURS**

Input /Output - Devices, memory mapped devices, DMA, device drivers, interrupt handling, scheduled vs non-scheduled I/O processing, block vs character devices.

Secondary Storage Management - Disks, sectors, tracks, blocks, disk head scheduling algorithms, the file abstraction, directories, links.

File Systems - File system architecture, file system data structures and system calls. Security - Protection domains and mechanisms, access control lists, capabilities, user authentication, encryption, common internal and external attacks.

Practical with Linux

- Single-level Directory.
- Contiguous Allocation.

REFERENCE BOOKS

A. Dhananjay M. Dhamdhere, Operating Systems: A Concept-Based Approach (3rd Edition), McGraw Hill Education (India) Pvt Ltd.

B. William Stallings, Operating Systems: Internals and Design Principles (6th Edition), Pearson Publications.

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	-	-	S	-	-	-
CO2	M	L	-	S	-	-	-
CO3	M	L	-	S	-	-	-
CO4	M	-	-	S	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
(Mr AravindGovindraj)
Regional Technical Head
UTL Technologies, Bangalore

Verified by
(Dr Anna SaroVijendran)
Dean, School of Computing

Approved by
(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ITE01	COMPUTER GRAPHICS AND VISUALIZATION	DSE	55	-	-	4	A

PREAMBLE / COURSE OBJECTIVE

- To enable the students to understand the basic knowledge on computer graphics.
- Learn the key difference between 2D transformation and viewing.
- Learn the various color models and 2D clipping methods.
- To understand the OpenGL 3D viewing functions.
- To gain knowledge about OpenGL Surface functions.

DEPARTMENT OFFERING

BScInformation Technology

PREREQUISTE

Higher Secondary Level –Basic computer knowledge

EXPECTED SKILL

Domain Knowledge / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Acquire basic knowledge on 2D graphics primitives and attributes.	Remember
CO2	Illustrate Geometric transformations on both 2D and 3D objects.	Understand
CO3	Apply the concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.	Apply
CO4	Identify the suitable hardware and software for developing graphics packages using OpenGL.	Understand
CO5	Analyze the OpenGL Surface functions.	Apply

SYLLABUS

UNIT I

10 HOURS

Computer Graphics: Basics of computer graphics, Application of Computer Graphics, Video Display Devices: Random Scan and Raster Scan displays, color CRT monitors, Flat panel displays. OpenGL: Introduction to OpenGL, coordinate reference frames, specifying two-dimensional world coordinate reference frames in OpenGL, OpenGL point & line functions, point, line& curve attributes, OpenGL point & line attribute functions, Line drawing algorithms, circle generation algorithms.

UNIT II

11 HOURS

Fill area Primitives: Polygon fill-areas, OpenGL polygon fill area functions & attributes, general scan line polygon fill algorithm, OpenGL fill-area attribute functions. 2D Geometric Transformations: Basic 2D Geometric Transformations, matrix representations. Inverse transformations, 2D Composite transformations, OpenGL raster transformations, OpenGL geometric transformations function, 2D viewing: 2D viewing pipeline, OpenGL 2D viewing functions.

UNIT III

12 HOURS

Clipping: clipping window, normalization and viewport transformations, clipping algorithms, 2D point clipping, 2D line clipping algorithms: cohen-sutherland line clipping.3D Geometric Transformations: 3D translation, rotation, scaling, composite 3D transformations, OpenGL geometric transformations functions. Color Models: Properties of light, RGB and CMY color models. Illumination Models: Light sources, basic illumination models.

UNIT IV

10 HOURS

3D Viewing:3D viewing concepts, 3D viewing pipeline, 3D viewing coordinate parameters, Projection transformation, orthogonal projections, perspective projections, The viewport transformation and 3D screen coordinates. OpenGL 3D viewing functions. Visible Surface Detection Methods: back face detection, depth buffer method and OpenGL visibility detection functions.

UNIT V

12 HOURS

Input and Interaction: Input devices, clients and servers, Display Lists, Programming Event Driven Input, Menus Picking, Building Interactive Models, Animating Interactive programs, Design of Interactive programs, Logic operation.Curved surfaces, quadric surfaces, OpenGL Quadric-Surface and Cubic-Surface Functions, Bezier Spline Curves, Bezier surfaces, OpenGL curve functions. Corresponding OpenGL functions.

TEXT BOOKS

A. Donald Hearn, Pauline Baker&Warren Carithers, Computer Graphics with OpenGL Version, 4th Edition, Pearson Education, 2015

B. Edward Angel &Dave Shreiner, Interactive Computer Graphics- A Top Down approach with OpenGL, 5th edition, Pearson Education, 2012

REFERENCE BOOKS

A. James D Foley, Andries Van Dam, Steven K Feiner, John F Huges, Computer graphics: Principals and Practice,Pearson education, 3rd edition2014.

B. Xiang, Plastock, Computer Graphics, sham's outline series, 2nd edition, TMG, 2007.

C. Kelvin Sung, Peter Shirley, Steven Baer, Interactive Computer Graphics, concepts and applications, Cengage Learning India, 1st edition, 2010.

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	S	S	-	M	-	-	-
CO3	S	S	-	M	-	-	-
CO4	S	-	-	M	-	-	-
CO5	S	S	-	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
(Karthik S)
Course Co-ordinator

Verified by
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Dean, School of Computing

Approved by
(Dr Sumathi N)
BoS Chairman

(Dr Jayasheela D)
Academic Council Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ITE02	Linux Administration Level I	DSE	55	-	-	4	A

PREAMBLE / COURSE OBJECTIVE

- Understand the role and responsibilities of a Unix system administrator
- Install and configure the Linux operating system
- Manage the resources and security of a computer running Linux at a basic level
- Make effective use of Unix utilities, and scripting languages
- Configure and manage virtual machines on a Linux system

DEPARTMENT OFFERING

BScInformation Technology

PREREQUISTE

Higher Secondary Level –Basic Computer Knowledge

EXPECTED SKILL

Domain Knowledge / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify and understand basic Linux general purpose commands using shell script	Remember
CO2	Apply and change the ownership and file permissions using advance Linux commands	Apply
CO3	Customize Linux file access operations and configure using SSH server	Apply
CO4	Configure IPV4 networking	Apply
CO5	Design and configure Red hat enterprise Linux with virtual machines	Create

SYLLABUS

UNIT I

11 HOURS

Access the command line

Log in to a Linux system and run simple commands using the shell- **Manage files from the command line**- Copy, move, create, delete, and organize files from the bash shell prompt- **Get help in Red Hat Enterprise Linux**-Resolve problems by using online help systems and Red Hat support utilities-**Create, view, and edit text files**-Create, view, and edit text files from command output or in an editor.

UNIT II

11HOURS

Manage local Linux users and groups-Manage local Linux users and groups, and administer local password policies -**Control access to files with Linux file system permissions**-Set Linux file system permissions on files and interpret the security effects of different permission settings-**Monitor and manage Linux processes**-Obtain information about the system, and control processes running on it-**Control services and daemons**-Control and monitor network services and system daemons using system.

UNIT III

11HOURS

Configure and secure Open SSH service- Access and provide access to the command line on remote systems securely using Open SSH- **Analyse and store logs**-Locate and accurately interpret relevant system log files for troubleshooting purposes.

UNIT IV

11 HOURS

Manage Red Hat Enterprise Linux networking

Configure basic IPv4 networking on Red Hat Enterprise Linux Systems-**Archive and copy files between systems**-Archive files and copy them from one system to another

UNIT V

11HOURS

Install and update software packages-Download, install, update, and manage software packages from Red Hat and yum package repositories-**Access Linux file systems**-Access and inspect existing file systems on a Red Hat Enterprise Linux system-**Use virtualized systems-** Create and use Red Hat Enterprise Linux virtual machines with KVM and libvirt.

REFERENCE BOOKS

A. Sander van Vugt, Red Hat RHCSA/RHCE 7 Cert Guide: Red Hat Enterprise Linux 7 (EX200 and EX300) (Certification Guide) 1st Edition, Pearson IT, 2015.

MAPPING WITH PROGRAM OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	L	S	-	S	-	-	-
CO3	L	S	-	S	-	-	-
CO4	L	-	-	S	-	-	-
CO5	L	S	-	S	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

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Dean, School of Computing

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BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ITE03	DATA ANALYTICS AND BUSINESS INTELLIGENCE	DSE	55	-	-	4	A

PREAMBLE / COURSE OBJECTIVE

- To know how to derive meaning from huge volume of data and information.
- To understand Data mining principles and techniques.
- To learn to use association rule mining for handling large data.
- To understand the concept of classification for the retrieval purposes.
- To understand how knowledge discovering process is used in business decision making.

DEPARTMENT OFFERING

BSc Information Technology

PREREQUISTE

Higher Secondary Level –Basic computer knowledge

EXPECTED SKILL

Domain Knowledge / Employability / Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify the techniques of knowledge discovery for business applications.	Remember
CO2	Apply various steps of data mining to reduce dimensionality without sacrificing accuracy.	Apply
CO3	Design and deploy appropriate classification techniques.	Understand
CO4	Analyze Big Data Management with neural nets.	Analyze
CO5	Apply the association rules for mining the data.	Apply

SYLLABUS

UNIT I **11 HOURS**

Introduction - Changing Business Environments and Computerized Decision Support - Business Environment Factors - A Framework for Business Intelligence (BI) - BI's Architecture and Components - Automated Decision Making - Intelligence Creation and Use - Successful BI Implementation - Issues for Successful BI - Major BI Tools and Techniques.

UNIT II **11 HOURS**

What is data mining? - Where is data mining used? - Origins of data mining - Terminology and notations - Core ideas in data mining - supervised and unsupervised learning - steps in data mining - building model - data summaries - data visualization - Correlation analysis.

UNIT III **11 HOURS**

Classification Introduction - Judging classification performance - Evaluating predictive performance - Multiple linear regression - Explanatory Vs Predictive modeling - Estimating the regression equation and prediction - variable selection in linear regression - Classification methods introduction - Naive Bayes - k-nearest neighbors.

UNIT IV **11 HOURS**

Concept and structure of a neural network - fitting a network to data - Exploring the relationship between predictors and response - advantages and weaknesses of neural networks - discriminant analysis introduction - distance of an observation from a class - Fisher's linear classification function – classification performance of discriminant analysis.

UNIT V **11 HOURS**

Association Rules introduction -Discovering Association rules in transaction databases - Generating candidate rules - selecting strong rules - Cluster Analysis introduction - Measuring distance between two records - Measuring distance between two clusters - hierarchical clustering.

TEXT BOOKS

A. Galit Shmueli, Nitin R. Patel and Peter C. Bruce, "Data Mining for Business Intelligence - Concepts, Techniques and Applications", Wiley India, 2010. Unit 2,3,4,5 - Chapter 1-6, 9-12
B. Efraim Turban, Ramesh Sharda, Jay E. Aronson and David King, "Business Intelligence", Prentice Hall, 2008. Unit 1 - Chapter-1.

REFERENCE BOOKS

A. Jiawei Ham and Micheline Kamber, "Data Mining concepts and techniques", Kauffman Publishers, 3rd Ed., 2011.
B. Michel Berry and Gordon Linoff, "Mastering Data mining", John Wiley and Sons Inc, 3rd Ed., 2011.
C. Elizabeth Vitt, Michael Luckevich Stacia Misner, "Business Intelligence in Microsoft Sharepoint 2010", Microsoft Press., 2011.
D. Michalewicz Z., Schmidt M. Michalewicz M and Chiriac C, "Adaptive Business intelligence", Springer-Verlag Berlin Heidelberg, Reprint 2016.

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	-	-	M	-	-	-
CO2	S	M	-	M	-	-	-
CO3	S	M	-	M	-	-	-
CO4	S	M	-	M	-	-	-
CO5	S	M	-	M	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Prepared by
(Dr Deepa C)
Course Co-ordinator

Verified by
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Dean, School of Computing

Approved by
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BoS Chairman

(Dr Jayasheela D)
Academic Council, Member Secretary

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20MATCG14	MATHEMATICSFOR COMPUTING – II	GE	55	-	-	4	A(THEORY)

To enable the students to visualize the fundamental ideas about matrices, numerical methods and statistics.

DEPARTMENT OFFERING

P G & Research Department of Mathematics.

PREREQUISTE

Higher Secondary Level –matrices,numericalmethodandstatistics.

Bridge Course – If not studied in Higher Secondary Level

EXPECTED SKILL

Domain Knowledge

COURSE OUTCOMES

On successful completion of the course, students will be

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain the types of matrices and matrix operations	Understand
CO2	Solve algebraic and transcendental equations	Apply
CO3	Determine the solution for linear algebraic systems.	Apply
CO4	Apply the measures of central tendencies	Apply
CO5	Analyze data using correlation and regression	Analyze

SYLLABUS

UNIT I **10 HOURS**

Definitions–Operations– Inverse of a matrix–Eigen values-Eigenvectors–Characteristic equation–Cayley Hamilton Theorem (Statement only) – Simple problems.

UNIT II **10 HOURS**

Bisection method , Method of false position - Newton Raphson (No Derivation) – Simple problems.

UNIT III **11 HOURS**

Gauss Elimination method – Gauss Jordan method – Inversion of matrix - Gauss Jacobi method- Gauss Seidel methods (No Derivation) – Simple problems.

UNIT IV **12 HOURS**

Statistics - Introduction – Presentation of Data – Diagrams and Graphs – Measures of Central Tendency Mean, Median and Mode – Geometric Mean and Harmonic Mean – Measures of Dispersion – Standard Deviation – Co-efficient of Variation.

UNIT V **12 HOURS**

Meaning and definition – Scatter diagram – Karl Pearson's correlation co-efficient – Computation and Interpretation – Rank Correlation.
Meaning of Regression and linear prediction – Regression in two variables – Uses of regression.

TEXT BOOKS

A. Dr. M. K. Venkataraman "Numerical methods in Science and Engineering" National Publishing Company , 5th edition 1999, Reprint 2013.

B. Navnitham Pa , "Business Mathematics and Statistics " S.Chand & Co. Ltd., Reprint 2015.

C. Dr.M.K. Venkataraman, "Engineering Mathematics Vol. II " National Publishing Company,
4th edition 2003.

REFERENCE BOOKS

A. S. S . Sastry, "Methods of Numerical Analysis", Prentice-Hall India , 3rd edition 1999, Reprint 2014.

B. S.C. Gupta & V.K.Kapoor "Fundamentals of Mathematical Statistics" 1st Edition 1970, Reprint 2016.

C. R.S.N.Pillai & V. Bagavathi "Statistics" S.Chand & Co.Ltd, 7th Edition 2008, Reprint 2015.

WEB RESOURCES

A. http://mathforcollege.com/nm/topics/textbook_index.html

B. https://www.math.ust.hk/~machas/numerical-methods.pdf

C. http://onlinestatbook.com/Online_Statistics_Education.pdf

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	L	-	L	-	-	-
CO2	S	L	-	L	-	-	-
CO3	S	L	-	L	-	-	-
CO4	S	M	-	L	-	-	-
CO5	S	M	-	L	-	-	-

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

MALARVIZHI M
(CourseCoordinator)

Dr JAYASHEELA D
(Academic Council -Member Secretary)

Dr UMA N
(BOS Chairperson)

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT CODE
20ESA01	ENVIRONMENTAL STUDIES	AECC - III	26	-	-	1#	Theory

PREAMBLE/ COURSE OBJECTIVE

1. To recognize the major concepts of ecosystem and have in-depth understanding of environmental interactions and alternate energy resources.
2. To realize the effects of various environmental pollutants and measures to control pollution.
3. To identify the environmental social issues and develop problem – solving skills using scientific techniques.
4. To be aware of human population growth among the nations and the significance of human rights.

DEPARTMENT OFFERING

Biotechnology

PREREQUISTE

Higher Secondary Level

EXPECTED SKILL

Skill Development

COURSE OUTCOMES

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

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describe the principles of ecology and major concepts in environmental sciences.	Remember
CO2	Interpret the key concepts in Environmental pollution that apply to air, land and water issues on a global scale and population growth.	Understand
CO3	Investigate the polluted environment area and document the risks and formulate a design for the environmental health.	Analyze
CO4	Identify the Socio- Environmental issues and apply the related analysis for the protection of environment.	Apply
CO5	Describe the human rights and welfare and role of information technology in the environment.	Analyze

SYLLABUS

UNIT I — 4 HOURS

Multidisciplinary nature of environmental studies Definition, scope and importance, Need for public awareness. Introduction to Renewable and Nonrenewable sources – Uses of alternate energy sources.

UNIT II — 6 HOURS

Ecosystems - Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Food chains, food webs and ecological pyramids. Types of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity – Levels – Patterns – Threats – Biodiversity services.

UNIT III — 5 HOURS

Environmental Pollution – Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Solid waste Management : Causes, effects and control measures of urban and industrial wastes. Disaster management : floods, earthquake, cyclone and landslides.

UNIT IV — 6 HOURS

Social Issues and the Environment Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Environmental Issues in Coimbatore District (Noyyal River, Dye Industries and Agricultural issues). Environmental ethics : Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents. Environment Protection Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

UNIT V — 5 HOURS

Human Population and the Environment - Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights - Women and Child Welfare, Role of Information Technology in Environment and human health.

***Activity – Documentation about Impacts of pollutants in Environment/ Socio – Environmental Issues.**

TEXT BOOKS

A. Erach Bharucha. "Textbook for Environmental Studies for Undergraduate Courses", 2nd edition, University Grants Commission, New Delhi and Bharati Vidyapeeth Institute of Environment Education and Research, Pune, University Press, Revised edition.

REFERENCE BOOKS

A. M P Poonia and S C Sharma "Environmental Studies - Concepts, Impacts, Mitigation and Management", 2nd edition, Khanna Book Publishing, 2017.

B. R Rajagopalan "Environmental Studies", 3rd edition, Oxford University Press, 2015.

C. Dr D K Asthana and Dr Meera Asthana, Text Book of Environmental Studies, Revised edition, S Chand and Company, 2010.

D. Shashi Chawla "A Text Book of Environmental Studies", 1st edition, Tata McGraw Hill, 2012.

WEB RESOURCES

A. https://ugc.ac.in/oldpdf/modelcurriculum/env.pdf

B. https://play.google.com/books/reader?id=ZHsoDwAAQBAJ&hl=en&pg=GBS.PP1

C. http://www.nacwc.nic.in (Suggested by UGC)

D. http://www.opcw.org (Suggested by UGC)

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1					M				
CO2					M				
CO3					M				
CO4					M				
CO5					M		S		

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (If deviation from common pattern)

No Comprehensive Examinations. Only Continuous Internal Assessment (CIA).

Verified and Approved by

Course Coordinator
(Dr Jayasheela D)

Academic Council

Principal

Sri Ramakrishna College of Arts and Science (Autonomous)
Coimbatore – 641006

20ESA01 - ENVIRONMENTAL STUDIES

[A one Credit Course offered for First years
With effect from 2020-2021 Academic year and onwards]

SCHEME OF EXAMINATION

1. Environmental Studies paper is an Ability Enhancement Compulsory Course (AECC) with **ONE CREDIT**.
2. It is an extra credit course. Not included in total marks and CGPA calculation.
3. The course will have only one Internal Examination (Model Examination for 2 hours) at the end of the semester.
4. The evaluation pattern is descriptive type written examination.
5. The course carries a total marks of 100 out of which 60 marks will be allocated for descriptive examination and 40 marks will be assigned for other assessment components.
6. The Passing minimum is 40 out of 100 marks.
7. The assessment will consist of two parts, as detailed below:

S.No	Nature of Exam	Maximum Marks	Remarks
1.	Descriptive Examination	**60 Marks** (Section A: 8 x 5 = 40) (Section B: 2 x 10 = 20)	• Centralized Examination • For 2 Hours Duration • Descriptive type questions • Model Examination only
2.	Other Assessment Components	**40 Marks** (Activity – 20 Seminar – 10 Documentation Report – 10)	**Activity** – Quiz (Kahoot, Hot Potatoes, Plickers)/ Group Discussion/ Participation certificate in seminar/ workshop/ Paper presentation/ Model Design **Seminar** – Classroom activity/ Google Classroom **Documentation Report** – Google Classroom/ Individual Report to be submitted to the Subject handling faculty
Total		**100 Marks**	

Course Coordinator **Academic Council** **Principal**

SEMESTER 2

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	ASSESSMENT
20LSA02	Life Skills-II	SEC	40	-	-	2	Theory

PREAMBLE / COURSE OBJECTIVE

This course aims at

- Developing essential skills to influence and motivate others
- Creating and maintaining an effective and motivated team to work for the society
- Nurture a creative and entrepreneurial mindset and Explore desired career opportunities
- Inculcating and practicing human values

DEPARTMENT OFFERING

TIP Center

PREREQUISITE

First Semester - Life Skills- I

EXPECTED SKILL

Leadership Skills/ Professional Skills/ Entrepreneurial Skills

COURSE OUTCOMES

On successful completion of the course, students will be able to-

S. NO.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the skills, strengths and abilities of different leadership styles	Understand
CO2	Demonstrate the practical skills in conflict management and self management	Apply
CO3	Understand the basics of entrepreneurship and develop business plans	Apply
CO4	Explore sources of career opportunities	Apply
CO5	Become conscious practitioners of human values	Apply

SYLLABUS

UNIT I Leadership Skills **8 Hours**

Understanding leadership and its importance – meaning of leadership, significance of leadership required, characteristics of an ideal leader

Traits and Models of Leadership - leaders born or made, key characteristics of an effective leader, Leadership styles, perspectives of different leaders

Basic Leadership Skills – motivation, team work, negotiation, networking

UNIT II Managerial Skills **8 Hours**

Basic Managerial Skills - planning for effective management, organizing teams, recruiting and retaining talent, delegation of tasks, learning to coordinate, conflict management

Self-Management Skills - understanding self-concept, developing self-awareness, self-examination, self-regulation

UNIT III Entrepreneurial skills **8 Hours**

Basics of Entrepreneurship - meaning of entrepreneurship, classification and types of entrepreneurship, traits and competencies of entrepreneur

Creating Business Plan - problem identification and idea generation, idea validation, pitch making

UNIT IV Career Skills **8 Hours**

Group Discussion- meaning and methods, , procedure, simulation ,common errors

Exploring career opportunities – knowing yourself, personal characteristics, knowledge about the world of work, requirements of jobs including self-employment, sources of career information, preparing for a career based on potentials and availability of opportunities

UNIT V Universal Human Values **8 Hours**

Universal human values - love and compassion, truth, non-violence, righteousness, peace, service, renunciation (sacrifice)

TEXT BOOKS

A. Ashokan, M. S. (2015). Karmayogi: A Bibliography of E. Sreedharan. Penguin, UK.

B. Brown, T. (2012). Change by Design. Harper Business

C. Elkington, J., & Hartigan, P. (2008). The Power of Unreasonable People: How Social Entrepreneurs Create Markets that Change the World. Harvard Business Press.

D. Goleman D. (1995). Emotional Intelligence. Bloomsbury Publishing India Private Limited

E. Kalam A. A. (2003). Ignited Minds: Unleashing the Power within India. Penguin Books India

F. Kelly T., Kelly D. (2014). Creative Confidence: Unleashing the Creative Potential within Us All. William Collins

G. Kurien V., & Salve G. (2012). I Too Had a Dream. Roli Books Private Limited

H. Livermore D. A. (2010). Leading with cultural intelligence: The New Secret to Success. New York: American Management Association

I. McCormack M. H. (1986). What They Don't Teach You at Harvard Business School: Notes From A Street-Smart Executive. RHUS

REFERENCE BOOKS

A. O'Toole J. (2019) The Enlightened Capitalists: Cautionary Tales of Business Pioneers Who Tried to Do Well by Doing Good. HarperCollins
B. Sinek S. (2009). Start with Why: How Great Leaders Inspire Everyone to Take Action. Penguin
C. Sternberg R. J., Sternberg R. J., &Bales P. B. (Eds.). (2004). International Handbook of Intelligence. Cambridge University Press.

WEB RESOURCES

A. Fries, K. (2019). 8 Essential Qualities That Define Great Leadership. Forbes. Retrieved 2019- 02-15 from https://www.forbes.com/sites/kimberlyfries/2018/02/08/8-essentialqualities-that-define-great-leadership/#452ecc963b63.
B. How to Build Your Creative Confidence, Ted Talk by David Kelly - https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
C. India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta - https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention
D. Knowledge@Wharton Interviews Former Indian President APJ Abdul Kalam - , "A Leader Should Know How to Manage Failure" https://www.youtube.com/ watch?v=laGZaS4sdeU
E. Martin, R. (2007). How Successful Leaders Think. Harvard Business Review, 85(6): 60.
F. NPTEL Course on Leadership - https://nptel.ac.in/courses/122105021/9

MAPPING WITH PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1							M		
CO2					M		M		
CO3				L	M		M		
CO4				L	M		M		
CO5					M		M		

S- Strong; M-Medium; L-Low

ASSESSMENT PATTERN (if deviation from common pattern)

- Total: 100 Marks
- Online exam: 50 Marks
- Oral Evaluation: 50 Marks
- Passing Minimum: 40 %
- **External Assessment**

Prepared & Verified by
Dr Thamarai selvan M

Dr. S. DEENA, Ph.D.,
DIRECTOR
Catering Science & Hotel Mgt.,
Sri Ramakrishna College of Arts & Science
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Approved by
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