DEPARTMENT OF COMPUTER SCIENCE

COURSE STRUCTURE & SYLLABI
(For the students admitted from year 2023-2024 onwards)

Programme : B.Sc. Computer Science

SHOW US THE RIGHT PATH
Since 1951

JAMAL MOHAMED COLLEGE (AUTONOMOUS)
Accredited with A++ Grade by NAAC (4th Cycle) with CGPA 3.69 out of 4.0
(Affiliated to Bharathidasan University)
TIRUCHIRAPPALLI – 620 020

B.Sc. COMPUTER SCIENCE

Sem	Course Code	Part	Course Category	Course Title	Ins. Hrs/ Week	Credit	Marks		Total
							CIA	ESE	
I	23U1LT1/LA1/LF1 /LH1/LU1	I	Language - I		6	3	25	75	100
	23UCN1LE1	II	English - I	English for Communication - I	6	3	25	75	100
	23UCS1CC1	III	Core - I	Programming in C and C++	5	5	25	75	100
	23UCS1CC2P		Core - II	Programming in C and C++ Lab - Practical	3	3	20	80	100
	23UMA1AC1		Allied - I	Linear Algebra and Differential Equations	4	3	25	75	100
	23UMA1AC2		Allied - II	Numerical Methods with Octave	4	3	25	75	100
	23UCN1AE1	IV	AECC - I	Value Education	2	2	-	100	100
				Total	**30**	**22**			**700**
II	23U2LT2/LA2/LF2 /LH2/LU2	I	Language - II		6	3	25	75	100
	23UCN2LE2	II	English - II	English for Communication - II	6	3	25	75	100
	23UCS2CC3	III	Core - III (a)	Java Programming	4	4	10	40	50
	23UCS2CC3P		Core - III (b)	Java Programming Lab - Practical	2	2	10	40	50
	23UCS2CC4		Core - IV	Web Programming	3	3	25	75	100
	23UMA2AC3		Allied - III	Operations Research	4	3	25	75	100
	23UMA2AC4		Allied - IV	Statistics	3	3	25	75	100
	23UCN2SS	IV	Soft Skills Development	Soft Skills Development	2	2	-	100	100
	23UCN2CO	V	Community Outreach	JAMCROP	-	@	-	-	@
	23U2BT1 / 23U2AT1		Basic Tamil - I / Advanced Tamil - I	எழுத்தும் இலக்கியமும் அறிமுகம் - I / தமிழ் இலக்கியமும் வரலாறும் - I /	-	-	-	100 #	-
	@Only grades will be given			**Total**	**30**	**23**			**700**
III	23U3LT3/LA3/LF3 /LH3/LU3	I	Language - III		6	3	25	75	100
	23UCN3LE3	II	English - III	English for Communication - III	6	3	25	75	100
	23UCS3CC5	III	Core - V	Computer Organization and Architecture	4	4	25	75	100
	23UCS3CC6P		Core - VI	Web Programming Lab - Practical	3	3	20	80	100
	23UPH3AC5		Allied - V	Electronic Circuits and Devices	4	4	25	75	100
	23UPH3AC6P		Allied - VI	Electronics - Practical	3	2	20	80	100
	23UCS3GE1	IV	Generic Elective - I		2	2	-	100	100
	23UCN3AE2		AECC - II	Environmental Studies	2	2	-	100	100
				Total	**30**	**23**			**800**
IV	23U4LT4/LA4/LF4 /LH4/LU4	I	Language - IV		6	3	25	75	100
	23UCN4LE4	II	English - IV	English for Communication - IV	6	3	25	75	100
	23UCS4CC7	III	Core - VII	Database Management Systems	5	5	25	75	100
	23UCS4CC8P		Core - VIII	RDBMS Lab - Practical	3	3	20	80	100
	23UPH4AC7		Allied - VII	Digital Electronics and Microprocessor	5	4	25	75	100
	23UPH4AC8P		Allied - VIII	Digital and Microprocessor - Practical	3	2	20	80	100
	23UCS4GE2	IV	Generic Elective - II		2	2	-	100	100
	23UCN4EL		Experiential Learning	Internship	-	2	-	100	100
	23UCN4EA	V	Extension Activities	NCC, NSS, etc.	-	1	-	-	-
	23U4BT2 / 23U4AT2		Basic Tamil - II / Advanced Tamil - II	எழுத்தும் இலக்கியமும் அறிமுகம் - II / தமிழ் இலக்கியமும் வரலாறும் - II	-	-	-	100 #	-
				Total	**30**	**25**			**800**
V	23UCS5CC9	III	Core - IX (a)	Data Structures and Algorithms	4	4	10	40	50
	23UCS5CC9P		Core - IX (b)	Data Structures Lab - Practical	2	2	10	40	50
	23UCS5CC10		Core - X	Software Engineering	5	5	25	75	100
	23UCS5CC11		Core - XI	Cyber Security	5	5	25	75	100
	23UCS5CC12		Core - XII	Operating Systems	5	5	25	75	100
	23UCS5DE1A/B		Discipline Specific Elective - I (a)		3	2	10	40	50
	23UCS5DE1AP/BP		Discipline Specific Elective - I (b)		2	2	10	40	50
	23UCS5SE1	IV	Skill Enhancement Course - I	Open Source Technology	2	1	-	100	100
	23UCS5SE2P		Skill Enhancement Course - II	Open Source Technology Lab - Practical	2	1	-	100	100
	23UCS5EC1		Extra Credit Course - I*	Online Course	-	*	-	-	-
				Total	**30**	**27**			**700**
VI	23UCS6CC13	III	Core - XIII	Computer Graphics with Virtual Reality Systems	5	5	25	75	100
	23UCS6CC14		Core - XIV	Computer Networks	5	5	25	75	100
	23UCS6CC15		Core - XV	Internet of Things	5	5	25	75	100
	23UCS6PW		Project Work	Project Work	5	4	-	100	100
	23UCS6DE2A/B		Discipline Specific Elective - II		5	4	25	75	100
	23UCS6DE3AP/BP		Discipline Specific Elective - III		4	4	20	80	100
	23UCN6AE3	IV	AECC - III	Gender Studies	1	1	-	100	100
	23UCS6EC1		Extra Credit Course - II*	Online Course	-	*	-	-	-
	23UCSECA		Extra Credit Course for all**	Online Course	-	**	-	-	-
	*** Programme Specific Online Course for Advanced Learners** **** Any Online Course for Enhancing Additional Skills**			**Total**	**30**	**28**			**700**
				Grand Total		**148**			**4400**

GENERIC ELECTIVE COURSES

Semester	Course Code	Course Title
III	23UCS3GE1	Business Process Outsourcing
IV	23UCS4GE2	Web Design

Self-Study Course – Basic and Advanced Tamil

(Applicable to the candidates admitted from the academic year 2023 -2024 onwards)

Semester	Course Code	Course Title
II	23U2BT1	Basic Tamil – I (எழுத்தும் இலக்கியமும் அறிமுகம் - I)
	23U2AT1	Advanced Tamil – I (தமிழ் இலக்கியமும் வரலாறும் - I)
IV	23U4BT2	Basic Tamil – II (எழுத்தும் இலக்கியமும் அறிமுகம் - II)
	23U4AT2	Advanced Tamil – II (தமிழ் இலக்கியமும் வரலாறும் - II)

Mandatory

Basic Tamil Course - I and II are offered for the students who have not studied Tamil Language in their schools and college.

Advanced Tamil Course - I and II are offered for those who have studied Tamil Language in their schools but have opted for other languages under Part - I.

DISCIPLINE SPECIFIC ELECTIVES

Semester	Course Code	Course Title
V	23UCS5DE1A	Data Science with Python
	23UCS5DE1B	Digital Marketing
	23UCS5DE1AP	Data Science with Python Lab - Practical
	23UCS5DE1BP	Digital Marketing Lab - Practical
VI	23UCS6DE2A	Introduction to Cloud Computing
	23UCS6DE2B	Artificial Intelligence
	23UCS6DE3AP	Internet of Things Lab - Practical
	23UCS6DE3BP	Computer Graphics Lab – Practical

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UCS1CC1	CORE – I	5	5	25	75	100

Course Title	PROGRAMMING IN C AND C++

SYLLABUS		
Unit	**Contents**	**Hours**
I	Overview of C – Importance of C – Basic Structure of C Programs – Constants – Variables – Data Types in C – Operators in C – Expressions – Managing Input and Output Operations – Decision Making and Branching – Various Forms of IF Statements – The Switch Statement – The ?: Operator – *The GO TO Statement*.	15
II	Decision Making and Looping – The WHILE Statement– The DO Statement – The FOR Statement – Arrays – Types of Arrays – Need for User-Defined Functions – The Form of C Functions – Category of Functions – Call by Value – *Call by Reference*.	15
III	Basic concepts of OOP – Structure of C++ Program – Operators and Data Types in C++ – Manipulators – Inline Functions – Default Arguments – *Recursion* – Function Overloading – Classes and Objects – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.	15
IV	Constructors and Destructors – Constructors - Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Operator Overloading – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators using Friends – Rules for Overloading Operators–Inheritance: Extending Classes – Defining Derived Classes – Single Inheritance – *Multilevel Inheritance* – Multiple Inheritance.	15
V	Pointers, Virtual Functions and Polymorphism – Pointers –Pointers to Objects –this Pointer – *Pointers to Derived Classes* – Virtual Functions – Pure Virtual Functions – Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files.	15
VI	**Current Trends (For CIA only):** Developing C/C++ coding for simple real world application problems	

……. Self Study

Text Book(s):

1. E. Balagurusamy, *Programming in ANSI C*, Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition, 2011.
2. E. Balagurusamy, *Object Oriented Programming with C++*, Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition, 2011.

Reference Book(s):

1. Yashavant Kanetkar, *Let Us C*, BPB Publications, New Delhi, Thirteenth Edition, 2013.
2. Bjarne Stroustrup, *The C++ Programming Language*, Addison-Wesley, New York, Third Edition, Eighth Impression, 2012.

Web Resource(s):

1. https://www.programiz.com/c-programming
2. https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/
3. https://onlinecourses.nptel.ac.in/noc22_cs40/preview
4. https://archive.nptel.ac.in/courses/106/105/106105151/
5. https://nptel.ac.in/courses/106105151

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Recall the basic concept of procedure and object-oriented programming	K1
CO2	Illustrate the fundamental definitions and concepts of C and C++ Programming	K2
CO3	Apply the concept of decision-making, looping, arrays, functions and OOP concepts	K3
CO4	Analyze various programming constructs of C and C++	K4
CO5	Evaluate and explain the suitable logic and principles of C and C++ Programming for solving real-time application problems	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	2	3	2	2	1	2	2.3
CO2	3	3	3	3	2	3	2	2	2	2	2.5
CO3	3	3	2	3	2	3	2	2	2	2	2.4
CO4	3	3	3	2	2	3	2	3	3	2	2.6
CO5	3	3	3	3	2	3	2	3	3	3	2.8
										Mean Overall Score	2.52
										Correlation	High

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. O.A. Mohamed Jafar

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UCS1CC2P	CORE – II	3	3	20	80	100

Course Title	Programming in C and C++ Lab - Practical

Develop a C and C++Program to illustrate the use of

1. Arithmetic Statements
2. Different forms of if statements *(if, if-else and nested if-elses)*
3. Various Loop Control Structures *(while, do-while and for loop)*
4. Case Control Structure *(switch)*
5. Arrays
6. Call by Value and Call by Reference
7. Class and Object
8. a) Inline Function
   b) Friend Function
9. Function Overloading
10. Arrays of Objects
11. Constructors
12. Operator Overloading
13. Inheritance
14. Pointers
15. File

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Demonstrate the evaluation of expressions and compare the various decision-making and looping statements	K2
CO2	Construct Object-Oriented Programs using class, objects and functions	K3
CO3	Analyze and examine the result of the function overloading, operator overloading and constructors	K4
CO4	Compare the result of different Inheritance Programs	K5
CO5	Make use of Object-Oriented Concepts to solve real-life application problems and Interpret the results	K3, K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	2	3	2	2	2	2	2.4
CO2	3	3	3	3	2	3	2	2	2	2	2.5
CO3	3	3	2	3	2	3	2	2	2	2	2.4
CO4	3	3	3	2	2	3	2	3	3	2	2.6
CO5	3	3	3	3	2	3	3	3	3	3	2.9
										Mean Overall Score	2.56
										Correlation	High

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. O.A. Mohamed Jafar

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UMA1AC1	Allied - I	4	3	25	75	100

Course Title	Linear Algebra and Differential Equations

SYLLABUS

Unit	Contents	Hours
I	Matrices- *Special types of matrices*- Scalar multiplication of a matrix- Equality of matrices, Addition of matrices- Subtraction- Symmetric matrix-Skew symmetric matrix-Hermitian and skew Hermitian matrices- Multiplication of matrices- Inverse matrix- Orthogonal matrices (Problems only).	12
II	Solution of simultaneous equations-Rank of a matrix- Eigen values and Eigen vectors-*Cayley Hamilton theorem*. (Problems only)	12
III	Differential equations of the first order with higher degree – Equations solvable for p- Equations Solvable for y – *Equations Solvable for x* - Clairaut's form. (Problems only)	12
IV	*Linear Differential Equations with constant coefficients * - Particular integral – Special method of finding P.I. – Derivation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Different integrals of First Order P.D.E. (Problems only)	12
V	Standard type of first order partial differential equations I, II, III and IV (Clairaut's form) - *Lagrange's equations*. (Problems only).	12

…… Self Study

Text Books:

1. T.K. Manicavachagom Pillay, T. Natarajan and K.S. Ganapathy, Algebra Volume-II, Ananda Book Depot, Chennai (2019)
2. S. Narayanan, T.K. Manicavachagom Pillay, Calculus Volume-III, S. Viswanathan Publishers Pvt. Ltd. (2012).

UNIT I	Chapter 2	Sections 1-9	T.B-1
UNIT II	Chapter 2	Sections 10-13, 16	T.B-1
UNIT III	Chapter 1	Sections 5.1–5.4, 6.1, 6.2	T.B-2
UNIT IV	Chapter 2	Sections 1–4	T.B-2
	Chapter 3	Sections 1–3	
UNIT V	Chapter 4	Sections 5.1-5.4, 6	T.B- 2

Reference Books:

1. P. Kandasamy and K. Thilagavathy, Allied Mathematics, S. Chand & Company Ltd, New Delhi (2010).
2. A. Abdul Rasheed, Allied Mathematics, Vijay Nicole Imprints private limited, Chennai (2008).
3. S. Arumugam and A. Thangapandi Isaac, Ancillary Mathematics, New Gamma Publishing house (2002).

Web Resources:

1. https://nptel.ac.in/courses/111/107/111107111/
2. https://nptel.ac.in/courses/111/102/111102133/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	recognize and recall the basic concept of matrices and first order differential equations with examples.	**K1**
CO2	compute the operations on matrices and solving differential equations related problems.	**K2**
CO3	apply the concepts of matrices for solving system of equations, Eigen values and Eigen vectors.	**K3**
CO4	analyse the impact of an applications of mathematical concepts in computer science using matrices and differential equations.	**K4**
CO5	evaluate the general solution of ordinary and partial differential equations	**K5**

Relationship Matrix:

Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	**3**	2	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**2**	**2.5**
CO2	**3**	**3**	**2**	**2**	**1**	**2**	**3**	**2**	**3**	**2**	**2.3**
CO3	**3**	**3**	**2**	**2**	**1**	**3**	**2**	**3**	**3**	**2**	**2.4**
CO4	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2.6**
CO5	**2**	**2**	**2**	**3**	**1**	**2**	**2**	**2**	**3**	**2**	**2.1**
Mean Overall Score											**2.38**
Correlation											Medium

Mean Overall Score	**Correlation**
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:

Dr. M.A. Rifayathali
Mrs. A. Fathima Begam

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UMA1AC2	Allied – II	4	3	25	75	100

Course Title	Numerical Methods with Octave

SYLLABUS

Unit	Contents	Hours
I	Solution of Algebraic equations by the bisection method – The iteration method – * Newton-Raphson Method *.	**12**
II	Finite Differences: Forward differences – Backward difference. Interpolation: Gregory-Newton forward interpolation formula for equal intervals - *Gregory-Newton backward interpolation formula for equal intervals* – Related Problems.	**12**
III	Exact solutions to a set of linear equations using Gauss Elimination method and Gauss – Jordan Method – Inversion of a matrix using Gauss – *Elimination method*.	**12**
IV	Numerical Integration: Trapezoidal Rule – Simpson's 1/3 rule - *Simpson's 3/8 rule*.	**12**
V	Numerical Solution of Ordinary Differential Equations: Numerical solutions to an Ordinary Differential Equation by Euler's Method – Improved Euler Method – * Modified Euler Method *– Runge-Kutta's second order and fourth order method.	**12**

Note: Theoretical proof not expected.

…… Self Study

Text Book:

P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company Ltd(2010).

UNIT I	Chapter 3	Sections 3.1, 3.2 and 3.4
UNIT II	Chapter 5	Sections 5.1
	Chapter 6	Sections 6.2 and 6.3
UNIT III	Chapter 4	Sections 4.1, 4.2 and 4.3
UNIT IV	Chapter 9	Sections 9.9, 9.13 and 9.14.
UNIT V	Chapter 11	Sections 11.9 – 11.13.

Reference Books:

1. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Learning Private Limited, Fourth Edition (2009).
2. F.B. Hildebrand, Introduction to Numerical analysis, Second edition, Tata McgrawHill (1987).
3. A. Singaravelu, Numerical Methods, Meenachi Agency (2000)

Web Resources:

1. https://nptel.ac.in/courses/111107105
2. https://nptel.ac.in/courses/127106019

Digital Demonstration using OCTAVE

https://www.digimat.in/nptel/courses/video/113101072/L29.html

https://www.youtube.com/watch?v=4jD7GPt1x2U - The bisection method

https://www.youtube.com/watch?v=gAmhUrX5Byk - Newton-Raphson Method

https://www.youtube.com/watch?v=XYWEIxY6Qkw - Euler's Method

https://www.youtube.com/watch?v=02nBrrLlheQ - Runge-Kutta's Method

https://www.youtube.com/watch?v=lFPW0cTXhyk - Simpson's Rule

https://www.youtube.com/watch?v=bwqccQRG1R4 - Trapezoidal Rule

https://www.youtube.com/watch?v=EcM3tbLhosU - Gauss – Jordan Method

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Remember the common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.	**K1**
CO2	Demonstrate understanding numerical methods for various mathematical problems	**K2**
CO3	Apply numerical methods to obtain approximate solutions to mathematical problems.	**K3**
CO4	Analyse mathematical problems to determine the suitable numerical techniques.	**K4**
CO5	Evaluate the numerical solution of ordinary differential equations.	**K5**

Relationship Matrix:

Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	**3**	**3**	**3**	**2**	**1**	**3**	**3**	**3**	**1**	**3**	**2.5**
CO2	**2**	**2**	**3**	**2**	**1**	**3**	**3**	**3**	**1**	**3**	**2.3**
CO3	**2**	**3**	**3**	**1**	**1**	**3**	**3**	**2**	**1**	**2**	**2.1**
CO4	**3**	**2**	**2**	**1**	**1**	**3**	**3**	**3**	**1**	**2**	**2.1**
CO5	**3**	**2**	**2**	**2**	**1**	**3**	**3**	**2**	**1**	**2**	**2.1**
Mean Overall Score											**2.22**
Correlation											**Medium**

Mean Overall Score	**Correlation**
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators: Dr. V. Krishnan & Mrs. A. Fathima Begam

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UCN1AE1	AECC – I	2	2	-	100	100

Course Title	Value Education for Men

SYLLABUS		
Unit	**Contents**	**Hours**
I	**VALUES IN LIFE:** Purpose and philosophy of life – Need for values –five fold moral culture. Values: truth, loyalty, integrity, humility, trustworthy, considerate, not being greedy, clean habits, punctuality, kindness, gratitude, patience, respect and character building.	6
II	**PERSONAL WELLBEING**: Social responsibility - taming a healthy mind and body – personal hygiene - Balanced diet – meditation – yoga - positive thinking – introspection - a passion for Nature- Win-win strategy.	6
III	**ROLE OF MEN IN FAMILY**: As a responsible student – committed employee - loyal husband - dedicated father – fatherhood- sacrificing human – considerate true friend.	6
IV	**MAN A SOCIAL BEING**: A friendly neighbour - living a life with definite motives – emotions and moral desire- uncompromising will power- puberty- secondary sexual characters- marriage: Purpose – marital life- Harmony with spouse- fidelity towards spouse.	6
V	**PROFESSIONAL VALUES**: More of a giver than a taker - being compassionate – patriotism - respecting culture - dependence on God – avoiding worry- professional ethics.	6

Hours of Teaching: 5 Hours and Hours of Activity: 25 Hours

Textbook(s):

1. Value Education for health, Happiness and harmony, the world community service centre, Vethathri Publications
2. N. Venkataiah, Value Education, APH Publishing Corporation, New Delhi, 1998
3. K.R. Lakshminarayanan and M. Umamageshwari, Value Education, Nalnilam Publication, Chennai.

Web References:

1. https://www.slideshare.net/humandakakayilongranger/values-education-35866000
2. https://www.ananda.org/blog/5-secrets-to-a-harmonious-marriage/
3. https://www.un.org/esa/socdev/family/docs/men-in-families

Activity:

- Assignment on Values (not less than 20 Pages)
- Multiple Choice Questions and Quiz
- Elocution - (Manners and good Habits for 3 to 5 minutes)
- Field Visit
- Debating - Current issues
- Essay writing: Proper use of e-gadgets, Ethics, Cyber ethics, Social media, etc.,
- Case Study / Album Making / Poster Presentation / Documentary- Celebrating National Days, Drug abuse & illicit trafficking, Independence Day, Secularism, Teachers Day, National Youth Awakening Day, Father's Day / Mother's Day and etc.,

EVALUATION COMPONENT: TOTAL: 100 MARKS

Component I:

Documentary (or) Poster Presentation (or) Elocution - 25 marks

Component II:

Quiz (or) Multiple choice questions Test - 25 marks

Component III:

Album Making (or) Case Study on a topic (or) Field visit - 25 marks

Component IV:

Assignment (or) Essay Writing (or) Debating - 25 marks

Course Coordinator: Dr. M. Purushothaman

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23UCN1AE1	AECC - I	2	2	-	100	100

Course Title	Value Education for Women

SYLLABUS		
Unit	**Contents**	**Hours**
I	**VALUES IN LIFE:** Purpose and philosophy of life – Need for values –five fold moral culture - Imbibing values: truth, loyalty, integrity, humility, trustworthy, considerate, not being greedy, clean habits, punctuality, kindness, gratitude, patience, respect and character building.	6
II	**FAMILY**: Nuclear – cluster – significance - social functions - changing trend - role of women in family - obedient daughter - purposeful youth- dedicated wife - caring mother.	6
III	**PUBERTY**: Need of knowledge of menstruation- menstrual symptoms – handling – menstrual disorder - maintaining good personal hygiene - motherhood- Stages of pregnancy- post pregnancy care.	6
IV	**MARRIAGE**: Types of marriage - purpose of marriage- love and infatuation – need for marital preparation - pre and post marital counselling - conflicts in marital life - divorce single parenthood.	6
V	**HARMONY WITH SPOUSE**: Husband and wife relationship - fidelity towards spouse-relationship among the family members. Tenets of bride for healthy family – kindness, respect, patience, care, love.	6

Hours of Teaching: 5 hours and Hours of Activity: 25 hours

Textbook(s):

1. Value Education for health, Happiness and harmony, the world community service centre, Vethathri Publications
2. N. Venkataiah, Value Education, APH Publishing Corporation, New Delhi, 1998
3. Betty, Carten and Meg Goldric, The Changing family life style - A Framework for Family Therapy, 2nd Edition, 2000.
4. Marie, Madearentas, Family Life Education, CREST-Centre for research education service training for family promotion, Bangalore, 1999.

Web References:

1. https://www.slideshare.net/humandakakayilongranger/values-education-35866000
2. https://www.ananda.org/blog/5-secrets-to-a-harmonious-marriage/
3. https://www.nap.edu/read/2225/chapter/14

Activity:

- Assignment on Values (not less than 20 Pages)
- Multiple Choice Questions and Quiz
- Elocution - (Manners and good Habits for 3 to 5 minutes)
- Field Visit
- Debating - Current issues
- Essay writing: Proper use of e-gadgets, Ethics, Cyber ethics, Social media, etc.,
- Case Study / Album Making / Poster Presentation / Documentary- Celebrating National Days, Drug abuse & illicit trafficking, Independence Day, Secularism, Teachers Day, National Youth Awakening Day, Father's Day / Mother's Day and etc.,

EVALUATION COMPONENT: TOTAL: 100 MARKS

Component I:

Documentary (or) Poster Presentation (or) Elocution - 25 marks

Component II:

Quiz (or) Multiple choice questions Test - 25 marks

Component III:

Album Making (or) Case Study on a topic (or) Field visit - 25 marks

Component IV:

Assignment (or) Essay Writing (or) Debating - 25 marks

Course Coordinator: Dr. M. Purushothaman

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UCS2CC3	Core – III (a)	4	4	10	40	50

Course Title	Java Programming

SYLLABUS

Unit	Contents	Hours
I	Java Evolution : History – Features – Differences between C++ and Java – Java Environment – Java Development Kit – Application Programming Interface – Overview of Java Language – Introduction – Java Program Structure – Java tokens- Java Statements – Implementing a Java Program – Java Virtual Machine – Command line arguments – Constants, Variables and Data types – Basic Input/ Output – Simple Java Program – Operators and Expressions – *Branching and Looping Statements*.	12
II	Classes, Objects and Methods : Defining a Class – Creating Objects – Accessing class members – Constructors – Method Overloading – Static Members – Inheritance – Extending a Class – Overriding Methods – Final variables and methods – Final Classes – Finalizer methods – Abstract Methods and Classes – Methods with Varargs – Visibility Control – Arrays, Strings and Vectors – One-dimensional Array – Creating an Array – Two-dimensional Arrays – Strings – Vectors – Wrapper Classes – *Enumerated Types*.	12
III	Interfaces – Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables – Packages - Java API Package – Java API Packages- Using System Packages – Naming conventions – 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 – Implementing the 'Runnable' Interface – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – *Thread Exceptions – Thread Priority*.	12
IV	Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Managing Input/output Files in Java – Stream Classes – Byte Stream and Character Stream classes – Using Streams – Using the File Classes – Input / Output Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – *Random Access Files*.	12
V	Event Handling: The Delegation Event Model-Events-Event Sources-Event Listeners-Event Classes-Sources of Events-Event Listener Interfaces-Using the Delegation Event Model-Adapter Classes-Inner Classes- Introducing the AWT: AWT Classes-Component-Container-Working with Frame Windows-Introducing Graphics-Working with Color-Working with Fonts- Using AWT Controls, Layout Managers-FlowLayout-BorderLayout-GridLayout-CardLayout-GridBagLayout- *Menu Bars and Menus-Dialog Boxes*.	12
VI	**Current Trends (For CIA only):** Network Programming, JDBC and Swing Controls	

…… Self Study

Text Book(s):

1. E. Balagurusamy, Programming with JAVA, McGraw Hill India, Sixth Edition, 2019.
2. Herbert Schildt, Java The Complete Reference, Eleventh Edition, McGraw-Hill Education Pvt. Ltd., 2019.

Reference Book(s):

1. Sachin Malhotra and Saurabh Choudhary, Programming in Java,2nd Edition, Oxford University Press,2018.
2. C. Muthu, Programming with Java, Vijay Nicole imprints private Limited, 2004.

Web Resource(s):
1. https://www.programiz.com/java-programming 2. https://www.javatpoint.com/java-tutorial 3. https://onlinecourses.nptel.ac.in/noc22_cs102/preview

Course Outcomes		
Upon successful completion of this course, the students will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Understand the runtime environment, programming features and statements of Java Programming	K1, K2
CO2	Apply the concept of class, inheritance, interfaces and packages into real-world entities	K3
CO3	Analyze the stream classes for manipulating files.	K4
CO4	Explain the importance of Multithreading and Exception handling techniques	K5
CO5	Develop the small window-based real-life applications using Java	K5

Relationship Matrix:

Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	3	3	1	3	3	1	2.6
CO2	3	3	1	1	3	3	3	3	3	2	2.5
CO3	3	3	2	2	2	3	3	3	2	2	2.5
CO4	3	3	3	3	3	3	2	3	3	3	2.9
CO5	3	2	2	2	3	3	3	3	3	3	2.7
										Mean Overall Score	2.64
										Correlation	High

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	**Correlation**
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. M. Mohamed Surputheen

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UCS2CC3P	Core – III (b)	2	2	10	40	50

Course Title	Java Programming Lab - Practical

Develop a Java Program to:

1. Demonstrate
   a) Keyboard input and screen output
   b) Control statements
2. Define a class, describe its constructor, and instantiate its object
3. Demonstrate method overloading
4. Demonstrate single and two-dimensional arrays
5. Demonstrate various methods in the String and StringBuffer class
6. Demonstrate methods in the vector class
7. Implement the single inheritance and method overriding
8. Implement the multiple inheritance
9. Implement the concept of packages
10. Implement the concept of threads by using Thread class and Runnable interface
11. Implement the concept of Exception Handling
12. Demonstrate the use of File streams
13. Demonstrate the concept of Event handling
14. Design a Simple Calculator

Course Outcomes		
Upon successful completion of this course, the students will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Demonstrate the I/O statements and various control statements	K2
CO2	Compare and contrast the three types of looping statements	K2
CO3	Apply the concept of class, inheritance, interfaces and packages in a problem domain	K3
CO4	Distinguish between method overloading and method overriding	K4
CO5	Prove the power of Multithreading, Exception handling and Event handling techniques	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	3	3	1	3	3	1	2.6
CO2	3	3	1	1	3	3	3	3	3	2	2.5
CO3	3	3	2	2	2	3	3	3	2	2	2.5
CO4	3	3	3	3	3	3	2	3	3	3	2.9
CO5	3	2	2	2	3	3	3	3	3	3	2.7
										Mean Overall Score	2.64
										Correlation	High

Mean Overall Score = Sum of Mean Score of COs / Total Number of Cos

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. M. Mohamed Surputheen

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UCS2CC4	CORE – IV	3	3	25	75	100

Course Title	Web Programming

SYLLABUS		
Unit	**Contents**	**Hours**
I	Introduction To HTML and XHTML: Hyper Text Markup Language – Origin and Evolution – HTML Basics – Headings – Paragraphs – Tables – Forms – CSS – *Levels of Style Sheets* – Different forms of Selectors.	9
II	Overview of JavaScript – JavaScript Constituents – Java v/s JavaScript –Event Driven Computation – Syntactic Characteristics – Variables – Operators – Mathematical Functions – *Control Structures* – Arrays – Functions, Data and Objects	9
III	Introduction to AngularJS: What is AngularJS? – Benefits of AngularJS – First AngularJS Script – DIRECTIVES: App – Model – Bind – Init – Repeat – Valid – *Check Email Address*.	9
IV	Filters: What is Filter? – Uppercase – Lowercase – OrderBy – Currency – Array – EVENTS: Event – Click – Double Click – *Mouse Move* – Mouse Over – Key Up – Key Down	9
V	Expression: {{Expression}} – String – Number – Object – Array – Using – Controller & Scope: Controller – Defining Controller – Scope – MVC & Scope Module & API: Basics – AngularJS Module – *AngularJS API*.	9
VI	**Current Trends (For CIA only) –** AJAX and its uses, Set up a Server	

……. Self Study

Text Book(s):

1. Shivanand S Gornale, Basavanna M, Web Programming for Beginners, Shroff Publishers & Distributors Pvt.Ltd, New Delhi, First Edition, 2016
2. Ray Yao, AngularJS Programming Include Tests & Answers, 2015

Reference Book(s):

1. Chris Bates, Web Programming Building Internet Applications, Wiley India Pvt. Ltd, New Delhi, Third Edition, 2017.
2. Shyam Seshadri & Brad Green, AngularJS Up & Running, O'Reilly, First Edition, 2014

Web Resource(s):

1. https://spoken-tutorial.org/tutorial-search/?search_foss=HTML&search_language=English
2. https://spoken-tutorial.org/tutorial-search/?search_foss=JavaScript&search_language=English
3. https://intellipaat.com/blog/tutorial/angularjs-tutorial/

Course Outcomes

Upon successful completion of this course, the student will be able to:

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Compare and Contrast HTML and XHTML concepts and techniques.	K2 & K4
CO2	Develop the ability to logically plan and creating web pages using CSS.	K3
CO3	Evaluate the basic concept of AngularJS and its Directives.	K5
CO4	Examine the AngularJS filters and events.	K4
CO5	Select the appropriate design of single-page applications	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	1	2	3	3	3	0	0	1	1.9
CO2	3	3	3	2	1	3	3	3	2	0	2.3
CO3	3	2	3	2	3	2	3	3	3	0	2.4
CO4	2	3	2	2	3	3	3	2	2	2	2.4
CO5	3	3	3	3	3	3	2	3	3	3	2.9
Mean Overall Score											2.38
Correlation											Medium

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. S. Mohamed Iliyas

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UMA2AC3	Allied - III	4	3	25	75	100

Course Title	Operations Research

SYLLABUS

Unit	Contents	Hours
I	Linear Programming Problem- Mathematical Formulation of the Problem – Solving a LPP by Graphical method – General Linear Programming (LPP)- Standard form and Canonical form-* Basic Solution *- Solving LPP by Using Simplex Method (**Problem only**)	12
II	Transportation Problem: Finding IBFS by NWCR, LCM, VAM for given Transportation Problem (Balance and unbalanced). (**Problem only**)	12
III	Assignment Problem (Balanced and unbalanced) – Hungarian Method – Problem of Sequencing Problem - Processing n-jobs through 2-machine – *processing 2-jobs through k-machine*. (**Problem only**)	12
IV	Games and Strategy : Introduction – Two-person zero –sum games – *Some Basic terms – The maxmin –minmax principle* – Games without saddle points – mixed strategies – Graphic solution of 2 X n and m X 2 games. (**Problem only**)	12
V	Network scheduling by CPM – Networks basic components – Logical sequencing – *Rules of Network constructions* – Critical Path Analysis. (**Problem only**)	12

…… Self Study

Text Book:

KantiSwarup, P.K.Gupta and Man Mohan, Operations Research, Sultan Chand &son Pvt. Ltd, 2009

UNIT I: Chapter 2, 3&4 Sections: 2.3,2.4,3.2 - 3.5, 4.1- 4.3.
UNIT II: Chapter 10 Section:,10.9.
UNIT III: Chapter 11&12 Sections: 11.1 – 11.3, 12.4,12.6.
UNIT IV: Chapter 17 Sections: 17.1 – 17.6.
UNIT V: Chapter 25 Sections: 25.1 – 25.4, 25.6.

Reference Books:

1. P.Prem kumar Gupta and D.S. Hira , Operations Research,S.Chand,2000.
2.J.K.Sharma , Operations Research Theory and Applications ,Macmillan India Ltd.(2000)
3.V.Sunderesan,K.S.Ganapathy Subramaniam,K.Ganesan, Operations Research, A.R.Publications,3rd Edition,2005

Web Resources:
MOOC learning:

1. https:/nptel.ac.in/courses/111/107/111107128/
(Lectures by Prof. Kusum Deep, Dept. of Mathematics ,IIT Roorkee)
2. https://nptel.ac.in/courses/112/102/112106134/
(Lectures by Prof.G.Srinivasan, Dept. of . Management Studies IIT Madras)
3.https://www.youtube.com/watch?v=-1jpfY0zA7s (Standard and Canonical Form)
4..https://www.youtube.com/watch?v=fSuqTgnCVRg (Game therory)
5.https://www.youtubr.com/watch?v=KG5b0xZ_Ba8 (Networking theory).

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	define the features of operations research with applications and limitations with practical examples.	**K1**
CO2	illustrate LPP by Graphical and Simplex methods.	**K2**
CO3	construct the Basic feasible solution of Transportation problem by different methods.	**K3**
CO4	analyse the optimum solution for Assignment problems with illustrations.	**K4**
CO5	determine Network scheduling and demonstrate critical path analysis with examples.	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	3	3	3	3	2	2	3	2.8
CO2	3	3	3	3	3	3	3	3	3	2	2.9
CO3	3	3	3	3	3	3	2	3	2	3	2.8
CO4	3	3	3	3	3	3	2	3	2	2	2.7
CO5	3	3	3	3	3	3	3	2	2	3	2.8
Mean Overall Score											**2.8**
Correlation											**High**

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:
Dr. M. Mohamed Althaf
Mrs. Z. Sirajunisha

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UMA2AC4	Allied - IV	3	3	25	75	100

Course Title	Statistics

SYLLABUS

Unit	Contents	Hours
I	Arithmetic Mean-Properties of Arithmetic Mean-Weighted Mean–Median. Merits and Demerits of Mean, *Median*.	**9**
II	Mode- Geometric Mean- Harmonic Mean. Graphical Location of the Partition values. Merits and Demerits of Mode, Geometric Mean and * Harmonic Mean*.	**9**
III	Dispersion-Characteristics for Ideal Measure of Dispersion-Measures of Dispersion -Range- Q.D- M.D- S.D, Coefficient of Dispersion -*Coefficient of Variation*-	**9**
IV	Correlation–Types of Correlation–Scatter Diagram–Karl-Pearson's Coefficient of *Correlation Spearman's Rank Correlation*.	**9**
V	Regression- Linear -Properties of correlation and regression coefficients. (Numerical Problems only)	**9**

…… Self Study

Text Book:

S.C. Gupta & V.K. Kapoor, Elements of Mathematical Statistics, Sultan Chand and Sons, Third Edition, Reprint2010.

UNITI	**Chapter 2**	**Sections2.3–2.6**
UNITII	**Chapter 2**	**Sections2.7 –2.9.1& 2.11.1**
UNITIII	**Chapter 3**	**Sections3.1–3.7,3.7.3,3.8**
UNITIV	**Chapter10**	**Section10.1to10.3,10.6**
UNITV	**Chapter10**	**Section10.7**

Reference Books:

1. S.C.Gupta and V.K.Kapoor , Fundamental of Mathematical Statistics , Sultan Chand and Sons Pubilication, 11th Edition,2013.
2.Murray R.Speigal ,John Jschiller ,R.Alu Srinivasan , Probability and statistics , 3rd Edition ,shaum's Outline series ,2010.
3.P.R.Vittal, Business Mathematics and Statistics, Margham Pubilications,2021

Web Resources:

MOOC learning:

1. https://nptel.ac.in/courses/110107114(Introduction – Objectives- Diagrams and Graphs)
(Lectures by Prof.Mukesh Kumar Barua, Dept. of Management Studies ,IIT Roorkee)
2. https://www.syncfusion.com/ebooks/statistics/descriptive-statistics
(Measures of central tendency and dispersion)
3. https://www.youtube.com/watch?v=cOuUsZ9yNyk (Diagramamatic and graphical)
4. https://www.youtube.be/XrGM0OANzaE (Measures of central tendency)
5. https://www.youtu.be/O48XEfedSWs (S.D)
6. https://www.youtu.be/5TJ52gAjzOI (M.D)
7. https://www.youtu.be/C1gjdiCxQ2s (Q.D)
8. https://www.youtu.be/iJcO1ZzX-Qo (correlation)
9. https://www.youtu.be/pT8M17HUh8c (Regression)

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	demonstrate the basic concepts about collection and representation of data with practical examples.	**K1**
CO2	identify the methods for different type of Mean and discuss its merits and demerits.	**K2**
CO3	examine and understanding of the concepts of Median and Mode with examples.	**K3**
CO4	determine the measures of dispersions and their coefficients.	**K4**
CO5	evaluate the direction of linear relationship between two variables, correlation and Regression.	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	2	2	3	1	3	3	3	3	3	**2.6**
CO2	3	3	3	3	1	3	2	3	3	3	**2.7**
CO3	3	3	3	2	0	3	3	3	3	2	**2.5**
CO4	3	3	3	2	0	3	3	3	3	2	**2.5**
CO5	3	3	3	2	0	3	3	2	2	2	**2.3**
Mean Overall Score											**2.52**
Correlation											**High**

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators: Dr. T. Shiek Pareeth & Mrs. Z. Sirajunisha

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23UCN2SS	Soft Skills Development	2	2	-	100	100

Course Title	Soft Skills Development

SYLLABUS		
Unit	**Contents**	**Hours**
I	**Communication Skills:** Verbal and Non - Verbal communication - The active vocabulary - Conversational Etiquette - KOPPACT syndrome	6
II	**Emotional Skills:** Emotional Intelligence - The five steps to Emotional Quotient - Self Awareness and Regulation - Empathy - Social Intelligence - stress management - coping with failures	6
III	**Functional Skills:** Using the tools of communicatory and emotional skills - Resume writing - Preparation of Curriculum Vitae - interview skills - Acing the interview - Group dynamics - Mock interviews and Group discussions	6
IV	**Interpersonal Skills:** Synergising relationships - SWOT analysis - SOAR analysis - The social skills - Time Management - Decision making - problem solving - prioritising and Implementation	6
V	**Personality Skills:** Leadership skills - Attributes and Attitudes - Social leader Vs The Boss - critical and creative thinking	6

Hours of Teaching : 5 hours and Hours of Activity: 25 hours

Textbook(s):

1. Social intelligence: The new science of human relationships - Daniel Goleman; 2006.
2. Body Language in the workplace - Allan and Barbara Pease; 2011.
3. Student's Hand Book: Skill Genie - Higher education department, Government of Andhra Pradesh.

Web References:

1. https://nptel.ac.in/courses/109105110

EVALUATION CRITERIA

Work Book (Each unit carries 10 marks) - **50 Marks**
Examination - **50 Marks**

1. Teacher who handles the subject will award 50 marks for work book based on the performance of the student.
2. On the day of examination the examiners (Internal & External) will jointly award the marks for the following categories:

- Self-Introduction - 20 Marks
- Resume - 10 Marks
- Mock Interview - 20 Marks

To assess the self-introduction, Examiners are advised to watch the video presentation submitted by the students. If they failed to submit the video presentation, the Examiners may direct the student to introduce himself orally and a maximum 10 marks only will be awarded.

Mock Interview Marks Distribution (**20-Marks**)

Attitude (self interest, confidence etc.) (4 Marks)	Physical appearance including dress code (4 Marks)	Communication Skills (6 Marks)	Answering questions asked from the resume and work book (6 Marks)

Course Coordinator: Dr. M. Syed Ali Padusha

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UCS3CC5	Core – V	4	4	25	75	100

Course Title	Computer Organization and Architecture

SYLLABUS		
Unit	**Contents**	**Hours**
I	Digital Logic Circuits: Digital Computers – Logic Gates – Combinational Circuits – Flip flops (SR, D JK) – Decoder – Encoder – Multiplexer – *Register*	12
II	Data Representation: Data Types – Complements – Fixed-Point Representation – Floating-Point Representation – Register Transfer and Microoperations: Register Transfer – Bus and Memory Transfer – Arithmetic Microoperations – Logic Microoperations – Shift Microoperations – *Arithmetic Logic Shift Unit*	12
III	Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – *CISC and RISC characteristics*	12
IV	Input-Output Organization: Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Direct Memory Access – CPU-*IOP Communication*	12
V	Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory	12
VI	**Current Trends (For CIA only):** Types of Computer Architecture, Microprocessors	

…… Self Study

Text Book(s):

3. Morris Mano M, Computer System Architecture, Prentice Hall of India, Third Edition, 2009

Reference Book(s):

3. Thomas C. Bartee, Digital Computer Fundamentals, Tata McGraw-Hill, Sixth Edition, 2006
4. Morris Mano M, Digital Logic and Computer Design, Prentice Hall of India, 2008

Web Resource(s):

1. https://www.tutorialspoint.com/Computer-System-Architecture
2. https://www.javatpoint.com/computer-organization-and-architecture-tutorial
3. https://nptel.ac.in/courses/106105163

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Define the various data types and their representation	K1
CO2	Classify the different logic gates and input-output devices	K2
CO3	Examine the organization of memories	K3
CO4	Analyse the logic circuits and microoperations	K4
CO5	Explain the architecture and functionality of central processing unit	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	2	3	3	2	2	2	3	2.5
CO2	3	3	2	3	2	3	2	3	2	2	2.5
CO3	3	2	3	3	3	2	3	2	3	2	2.6
CO4	2	3	2	3	3	3	3	3	2	2	2.6
CO5	3	2	2	3	2	3	2	2	3	3	2.5
										Mean Overall Score	**2.54**
										Correlation	**High**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. T. Abdul Razak

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UCS3CC6P	CORE – VI	3	3	20	80	100

Course Title	Web Programming Lab – Practical

1. Write an HTML document to display a simple calculator.

2. Write an HTML document to create college application form.

3. Write a CSS program to link external style sheet.

4. Using CSS and HTML, make a webpage that has two columns. Each column should use half of the width of the page. The left half should have a light gray background and the right half should have a light green background. The left half should have a list of the 5-best selling books in Amazon's kindle store, and the right should have a list of your five favourite celebrities or athelets.

5. Write a program to illustrate CSS border style properties.

6. Write a JavaScript code to illustrate the use of arithmetic operators.

7. Write a JavaScript code to guess a random number.

8. Write a JavaScript code to check if an array contains a specified value.

9. Write an AngularJS program using directives.

10. Write an AngularJS program to add filters to directives.

11. Write an AngularJS program to add modules and controllers in file.

12. Write an AngularJS program to create a notepad application.

13. Write an AngularJS program to create a login application.

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Demonstrate the HTML concepts and techniques	K2
CO2	Construct and create web pages using CSS and JavaScript	K3
CO3	Analyze the basic syntax of AngularJS	K4
CO4	Examine the results of AngularJS filters and directives	K4
CO5	Evaluate the use of AngularJS concepts to solve real-life application problems	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	3	2	3	2	2	2	2	2.4
CO2	3	3	3	2	2	3	3	3	2	2	2.6
CO3	3	2	3	2	3	2	3	3	3	0	2.4
CO4	2	3	2	2	3	3	3	2	2	2	2.4
CO5	3	3	3	3	3	3	2	3	3	3	2.9
Mean Overall Score											**2.54**
Correlation											**High**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. S. Mohamed Iliyas

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UPH3AC5	ALLIED - V	4	4	25	75	100

Course Title	ELECTRONIC CIRCUITS AND DEVICES

SYLLABUS

Unit	Contents	Hours
I	**Semiconductor Physics** Intrinsic & Extrinsic Semiconductors – n-Type and p-Type semiconductors- Formation of PN Junction Diode -V-I characteristics –*Zener diode* –V-I characteristics – Zener diode voltage regulator -Rectifiers – Half wave & Full wave bridge rectifier	12
II	**Transistors** Transistor action: npn & pnp–Transistor characteristics CE and CB configuration – α and β relationship-Amplifier – Single Stage RC Coupled Amplifier –Principle of feedback –Types of feedback –Barkhausen criterion – Oscillator – Hartley oscillator.	12
III	**Special Devices** FET – Construction – n channel and p channel – FET Characteristics – FET parameters – FET amplifier (CS configuration) –Photo diode –Construction- Characteristics - LED – Construction- Characteristics- *LCD*- Construction - Seven segment display.	12
IV	Optical Fiber & Optoelectronic devices Types of fibers- Semiconductor laser source for optical communication-Block diagram of fiber optic communication system -Construction and Characteristics of Optoelectronic devices: Photoconductive Sensors – Photoconductive Cell, Applications, Photodiode, Phototransistor –Solar Cell	12
V	**Operational Amplifier:** Ideal Op-amp – Parameters – Inverting and Non-Inverting Operational Amplifiers – Adder – Subtractor – Sign changer – Scale changer – Op-amp Differentiator -Op-amp Integrator.	12

Text Book(s):

1. V.K. Mehta & Rohit Metha, Principle of Electronics, PH Printers & Publishers Private Ltd, Reprint 2008.
2. P.K.Palanisamy, Semiconductor Physics And Opto-Electronics , Scitech Publications (India).Pvt.Ltd, 2011
3. S Salivahanan, N Suresh Kumar, Electronic Devices and Circuits, McGraw Hill Education Pvt Limited, Chennai, Fourth Edition, 2019.

Reference Book(s):

1. Murugesan, Kiruththiga SivaPrasath ,Modern Physics,S. Chand & Co Thirteenth Edition, 2016
2. Applied Physics – Dr. M. Arumugam – Anuradha Agencies, 2011
3. D. Roy Choudhury and Shail B. Jain, Linear Integrated Circuits, New Age International Publishers, Fourth Edition, 2015

Web Resource(s):

1. 1. https://swayam.gov.in/nd1_noc19_ee36/preview

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Remembering some basic semiconductor devices, means of identifying them from their coding schemes and finding out their terminals	**K1**
CO2	understanding a knowledge of the principles and functioning of these semiconductor devices and their individual or standalone characteristic features using mathematical and graphical analysis so that they may be helpful in predicting their behavior and functioning when incorporated in circuitry	**K2**
CO3	Applying the essential techniques of circuit design employing these devices, the analysis of the circuits so constructed and the means of evaluating their parameters and performance using mathematical and graphical tools	**K3**
CO4	Analyzing a sound knowledge of the essential theoretical features and concepts such as modulation and demodulation, regulated power supplies, amplification, switching operations so that they may be useful not only for higher studies but also in providing theoretical framework for possible applications beneficial to the society	**K4**
CO5	Evaluating technical skills to wire the circuits and to trouble shoot them as well as to construct of new circuits for specific tasks thereby helping them to become entrepreneurs	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	3	2	2	3	2	3	2	3	2.5
CO2	3	3	2	2	2	3	2	3	2	2	2.4
CO3	3	2	3	2	3	3	2	3	2	3	2.6
CO4	2	3	2	3	2	3	2	3	3	3	2.6
CO5	2	3	2	2	2	2	3	3	3	3	2.5
Mean Overall Score											**2.52**
Correlation											**High**

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:

Dr. A. Mohamed Saleem
Dr. S. Abbas Manthiri

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UPH3AC6P	ALLIED - VI	3	2	20	80	100

Course Title	ELECTRONICS – PRACTICAL

S.No.	List of Experiments
1	Junction diode characteristics
2	Wave shaping Circuits (Positive & Negative Clippers & Clampers)
3	Op-Amp – Adder and Subtractor
4	Basic Logic gates – Discrete Components
5	Zener controlled rectifier
6	Zener diode characteristics
7	Op-Amp – Differentiator and Integrator
8	NAND as universal gates

Text Book(s):

1. M.N. Srinivasan,S.Balasubramaniyan, R. Ranganathan, A text book of Practical Physics, S.Chand&Sons , Reprint 2010.

Reference Book(s):

1. C.C. Ouseph, U.J. Rao& V. Vijayendran, Practical physics and electronics, S. Viswanathan, Pvt,Ltd, First edition,2007.

Web Resource(s):

1. www.physicstutoruials.org
2. www.sciencelearn.org.nz

Course Outcomes

Upon successful completion of this course, the student will be able to:

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Understand the basic principles of Electricity and Magnetism	**K1**
CO2	Acquire the experimental skills.	**K1**
CO3	Understand the characteristics of the semiconductor diodes and operational amplifiers.	**K2**
CO4	Analyzing the practical applications of Electricity ,Magnetism and Electronics in their day to day life.	**K4**
CO5	Evaluating the basic requirements for their higher studies.	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	1	2	3	2	2	2	3	1	2.1
CO2	3	2	3	2	2	2	2	2	3	2	2.3
CO3	3	2	2	2	2	2	2	2	3	2	2.2
CO4	3	2	3	2	1	2	2	2	3	3	2.3
CO5	3	2	3	3	2	2	2	2	3	2	2.4
Mean Overall Score											2.26
Correlation											Medium

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:

Dr. S. Abbas Manthiri

Dr. C. Hariharan

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UCS3GE1	Generic Elective – I	2	2	-	100	100

Course Title	Business Process Outsourcing

SYLLABUS		
Unit	**Contents**	**Hours**
I	Introduction to BPO: Basics of Business Process Outsourcing – History of BPO – Evolution of BPO – Global trends of BPO – *Future of BPO*	6
II	BPO Industry: Employment opportunities in BPO industry – Employee structure – Skill set required for BPO – Compensation levels – Future of BPO employee.	6
III	Models of BPO: BPO Model and Types of Vendors – Transaction Processing BPO – Elements of back-office services – Contact Centre BPO – Types of Call Centres – Components and working of a call centre – * Offshoring – Offshore BPO* – BPO Companies in India.	6
IV	Processes in BPO: Financial Services – Insurance – Human Resource BPO – Activities involved in HR BPO – *Career in HR BPO*	6
V	BPO Domains: Media and Entertainment BPO – Publishing BPO – social media and BPO – *Changing dynamics in Indian BPO Industry*.	6

…… Self Study

Text Book(s):

Business Process Outsourcing Handbook

Reference Book(s):

Sarika Kulkarni, Business Process Outsourcing, Jaico Publishing House, 2005

Web Resource(s):

https://www.techtarget.com/searchcio/definition/business-process-outsourcing
https://unity-connect.com/our-resources/bpo-learning-center/what-is-business-process-outsourcing/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Recall the basics of business process outsourcing	K1
CO2	Illustrate the fundamentals of BPO industry	K2
CO3	Examine the models of BPO and its vendor	K3
CO4	Analyze the importance of various processes of BPO	K4
CO5	Explain the appropriate domains of BPO	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	1	2	3	3	3	2	2	2	2.4
CO2	3	3	3	2	1	3	3	3	2	0	2.3
CO3	3	2	3	2	3	2	3	3	3	0	2.4
CO4	2	3	2	2	3	3	3	2	2	2	2.4
CO5	3	3	3	3	3	3	2	3	3	3	2.9
										Mean Overall Score	**2.48**
										Correlation	**Medium**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. S. Mohamed Iliyas

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	23UCN3AE2	AECC - II	2	2	-	100	100
Course Title	**Environmental Studies**						

Unit	Contents	Hours
I	The multidisciplinary nature of environmental studies Definition, scope, importance, awareness and its consequences on the planet.	6
II	**Ecosystems:** Definition, structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	6
III	**Natural Resources:** Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Heating of earth and circulation of air; air mass formation and precipitation. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. renewable energy resources significance of wind, solar, hydal, tidal, waves, ocean thermal energy and geothermal energy.	6
IV	**Biodiversity and Conservation:** Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns biodiversity hot spots. mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: *In situ* and *Ex situ* conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	6
V	**Environmental Pollution & Conservation:** Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution Waste to wealth - Energy from waste, value added products from waste, fly ash utilization and disposal of garbage, solid waste management in urban and rural areas, Swachh Bharat Abhiyan, recent advances in solid waste management, modern techniques in rain water harvesting and utilization.	6

Text books:

1. Asthana DK and Meera A, Environmental studies, 2nd Edition, Chand and Company Pvt Ltd, New Delhi, India, 2012.
2. Arumugam N and Kumaresan V, Environmental studies, 4th Edition, Saras Publication, Nagercoil, Tamil Nadu, India, 2014.

Activity – I:

1. Assignments – Titles on Environmental awareness to be identified by teachers from the following (scripts not less than 20 pages)
2. Elocution – (Speech on "Environment beauty is the fundamental duty" of citizen of the country for 3 to 5 minutes)
3. Environment issues – TV, Newspaper, Radio and Medias messages – Discussion ϖ Case Studies/Field Visit/Highlighting Day today environmental issues seen or heard
4. Debating/Report Submission – Regarding environment issues in the study period Activity II
5. Environmental awareness through charts, displays, models and video documentation.

Celebrating Nationally Important Environmental Days

- National Science Day – 28th February
- World wild life Day – 3rd March
- International forest Day – 21st March
- World Water Day – 22nd March
- World Meteorological Day – 23rd March
- World Health Day – 7th April
- World Heritage Day – 18th April
- Earth / Planet Day – 22nd April
- Plants Day – 26th May
- Environment Day – 5th June Activity III Discipline specific activities

EVALUATION COMPONENT:

Component I: (25 Marks) Document (or) Poster presentation or Elocution
Component II: (25 Marks) Album making (or) case study on a topic (or) field visit
Component III: (25 Marks) Essay writing (or) Assignment submission
Component IV: (25 Marks) Quiz (or) multiple choice question test

Course Outcomes		
Course Outcomes: Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-level)**
CO1	To understand the multi-disciplinary nature of environmental studies and its importance	K1
CO2	To obtain knowledge on different types of ecosystem	K2
CO3	To acquire knowledge on Renewable and non-renewable resources, energy conservation	K3
CO4	To understand biodiversity conservation	K4
CO5	To analysis impact of pollution and conversion waste to products	K5

Relationship Matrix:

Course Outcomes (COs)	**Programme Outcomes (POs)**					**Programme Specific Outcomes (PSOs)**					**Mean Score of COs**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	02	02	02	02	02	03	03	03	03	03	2.5
CO2	02	03	03	02	03	03	03	03	03	03	2.8
CO3	02	03	03	03	03	03	03	03	03	03	2.9
CO4	02	02	03	03	03	03	03	03	03	03	2.8
CO5	02	03	03	03	03	03	03	02	03	03	2.8
										Mean Overall Score	2.7
										Correlation	High

Mean Overall Score	**Correlation**
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. B. Balaguru

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UCS4CC7	Core - VII	5	5	25	75	100

Course Title	Database Management Systems

SYLLABUS		
Unit	**Contents**	**Hours**
I	Introduction to DBMS – Advantages – DBMS Services – Relational Model - RDBMS Terminology – The Relational Data Structure – Relational Data Integrity – Codd's Rules – Database Architecture and Data Modelling: Conceptual, Physical and Logical Models. E-R Model – *Components of E-R Model* – E-R Model Symbols	15
II	Database Design: Functional Dependencies – Introduction – Basic Definition – Trivial and Non-Trivial Dependencies – Closure of a Set of Dependencies – Non-loss Decomposition – First, Second and Third Normal Forms – Dependency Preservation – Boyce/Codd Normal Form.	15
III	Relational Algebra: Algebraic Operations – Select – Project – Set Operations – Cartesian Product - Rename – Join – Division. SQL – Advantages – Types of SQL Commands – Creating table – Modify Table – Views – INSERT, UPDATE, and DELETE Operations – Queries – Aggregate Functions with Grouping and Having Clause – *Sub-Queries*	15
IV	Joins Operations - Introduction to PL/SQL – Variables – Data Types – Control Structure – Cursors – Iterative Control Statement – PL/SQL Exception – Triggers – Types of Triggers – *Procedures and Packages*	15
V	Client/Server Technology and Client Server Database: Introduction – Benefits of C/S Computing –Applications Architecture – Database Security – *Database Security Risks* – Dimension of Database Security – Data Security Requirements – Database Users – Protecting the Data within the Database – Roles – Granting and Revoking Privileges	15
VI	**Current Trends (For CIA only):** Distributed Database Systems, Cloud Database	

…… Self Study

Text Book(s):

1. Alexis Leon and Mathews Leon, Database Management Systems, Vikas Publishing House Pvt. Ltd., New Delhi.
2. C.J Date, A Kannan and S. Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education Asia.

Reference Book(s):

1 Thomas M. Connolly, Carolyn E. Begg, Database Systems A Practical Approach to Design, Implementation, and Management, Pearson Education, Fifth impression 2012.

2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 5th Edition, Pearson Education LTD.

Web Resource(s):

1. http://www.db-book.com
2. https://lc.fie.umich.mx/~rodrigo/BD/An%20Introduction%20to%20Database%20Systems%208e%20By%20C%20J%20Date.pdf.
3. https://nptel.ac.in/courses/106106095

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Recall the basic concepts and various data models in the database	K1
CO2	Explain ER diagrams for real-time applications, populate and query a database by SQL	K2
CO3	Develop the knowledge of the processes of Database Development using SQL and PL/SQL	K3
CO4	Examine the database effectively by using normalization techniques	K4
CO5	Determine and implement access control rules to assign privileges and protect data in database	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	2	1	3	1	2	2	1	2.0
CO2	3	3	2	3	1	3	2	3	3	2	2.5
CO3	3	3	0	2	3	2	3	2	3	1	2.2
CO4	2	3	3	1	3	3	3	3	0	2	2.3
CO5	3	2	3	3	1	3	2	0	3	3	2.3
Mean Overall Score											**2.28**
Correlation											**Medium**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: S. Syed Ibrahim

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UCS4CC8P	Core – VIII	3	3	20	80	100

Course Title	RDBMS LAB – Practical

I SQL: Data Definition Languages:

1. Table Creation

   Constraints: Primary Key, Candidate key, Foreign key, Unique key

2. Table Alteration - Rename table and Column name,

   Add Column, Drop column,

   Modify Column size and Data type.

3. Drop Table

II SQL: Data Manipulation Languages:

1. Insertion
2. Update with Case statement
3. String Operations – LIKE, NOT LIKE with Wildcards
4. Set Operations
5. Tuple Variables – Join a table to itself with two different names
6. Aggregate Functions (avg. min, max, sum, count) Grouping and Having Clause
7. Ordering Tuples
8. Nested Subqueries – using IN, NOT IN, SOME, ALL Clauses
9. Deletion – Using Subqueries, Aggregate Functions
10. Join Operations – Inner-join,

    Outer-join – Left join, Right join, Full join

11. Views – View involving a single table

    View involving multiple tables.

III PL/SQL Procedure:

1. Reverse the String
2. Find Factorial number Using Function
3. Write a Program using Procedure with parameters IN and OUT
4. Prepare Student Mark Sheet
5. Prepare Employee Pay Roll
6. Write a program using Exception Handling.

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Design and Implement database Schema	K1
CO2	Ability to formulate queries using SQL DML	K3
CO3	Analyze the programs using the Views and Join	K4
CO4	Develop applications programs using PL/SQL with exception handling	K5
CO5	Declare and enforce integrity constraints on a database	K2

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	2	2	1	3	1	2	2	1	2.0
CO2	3	3	2	2	1	3	1	3	3	2	2.3
CO3	3	3	0	2	3	2	3	2	3	1	2.2
CO4	3	3	3	1	2	3	3	3	0	2	2.3
CO5	3	2	3	2	1	3	2	0	3	2	2.1
										Mean Overall Score	**2.18**
										Correlation	**Medium**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: S. Syed Ibrahim

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UPH4AC7	ALLIED - VII	5	4	25	75	100

Course Title	DIGITAL ELECTRONICS AND MICROPROCESSOR

SYLLABUS

Unit	Contents	Hours
I	**Number Systems:** Introduction to decimal, binary, octal & hexadecimal number systems – Interconversions –binary arithmetic operations – Addition, Subtraction, Multiplication and Division – 1's & 2's complements - signed binary numbers - BCD code - *Gray code – ASCII code*	15
II	**Logic gates and Boolean expressions:** *Logic gates* –AND, OR, NOT, NAND, NOR, EX-OR, and EX-NOR – Universality of NAND and NOR gates- Sum of Products (SOP) - Product of Sum (POS) Laws of Boolean algebra –- simplification of Boolean expressions using Boolean laws - De-Morgan's theorems-Karnaugh map:Minterms – 2, 3 & 4 variables – Don't care conditions.	15
III	**Arithmetic, Combinational and Sequential circuits:** *Half adder and full adder* – half subtractor and full subtractor–multiplexer – demultiplexer- Flip flops – RS, Clocked RS, J-K, J-K master slave and D flip flop	15
IV	**Microprocessor Architecture:** Intel 8085 architecture – Pin configuration – *Opcode – Operands – Instruction Word size* – Instruction Cycle – Fetch Operation – Execution Operation – Machine Cycle and State – Timing diagram – opcode fetch cycle– memory read – I/O read – memory write –I/O write	15
V	**Intel 8085 Assembly language:** Addressing modes – Intel 8085 instructions – data transfer, arithmetic, branch, stack, I/O and machine control group – stack – addition, subtraction, multiplication and division of 8-bit numbers – sum of the series of 8-bit numbers – sorting of numbers in ascending and descending order – block data transfer	15

….. Self Study

Text Book(s):

1. V.Vijayendran, S.Viswanathan, Introduction to Integrated electronics(Digital & Analog) PH Printers & Publishers Private Ltd, Reprint 2008.

Unit-I : 1.1 – 4.20. **Unit-II : 5.1 – 6.23.**

Unit-III: 7.1 – 8.18, 9.1 – 10.19, 16.1 – 16.13.

2. P.S.Manoharan, Microprocessors & Microcontrollers –P.S.Manoharan, Charulatha Publications, 2011

Unit-IV : 1.68 – 1.82.

3. B.Ram,Fundamentals of Microprocessors and Microcontrollers, B.Ram, Dhanpat Rai Publications,Reprint 2011.

Unit-V : 1.6-1.86 ,6.22 – 6.38.

Reference Book(s):

1. V.Vijayendran,Fundamentals of Microprocessor – 8085, S.Viswanathan, Printers & Publishers Private Ltd.
2. P.S.Manoharan, Microprocessors & Microcontrollers –P.S.Manoharan, Charulatha Publications, 2011

Web Resource(s):

1. https://pages.uoregon.edu/rayfrey/DigitalNotes.pdf 2.
2.https://www.tutorialspoint.com/microprocessor/microprocessor_tutorial.pdf
3.http://ce.sharif.edu/courses/86-87/1/ce126/resources/root/8085%20Microprocessor.pdf

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Remember the principles and operations of analog and digital instruments	**K1**
CO2	understand the digital principles and its applications	**K2**
CO3	Apply the principle of combinational and Flip-flops	**K3**
CO4	Analyze about the architecture of Intel 8085 Microprocessor	**K4**
CO5	Evaluate the assembly language programs of 8085 microprocessor using trainer kit	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	2	3	3	2	2	3	2	3	2	3	2.5
CO2	3	3	2	2	2	3	2	3	2	2	2.4
CO3	3	2	3	2	3	3	2	3	2	3	2.6
CO4	2	3	2	3	2	3	2	3	2	3	2.5
CO5	2	3	2	2	2	2	3	3	2	2	2.3
Mean Overall Score											**2.46**
Correlation											**Medium**

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:

Dr. A. Mohamed Saleem

Dr. S. Abbas Manthiri

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UPH4AC8P	ALLIED - VIII	3	2	20	80	100

Course Title	DIGITAL AND MICROPROCESSOR – PRACTICAL

S.No.	List of Experiments
1	Logic Gates AND, OR, NOT, NAND, NOR EX-OR and EX-NOR using ICs
2	Half adder and Full adder using AND,OR and EXOR gates
3	Half subtractor and Full subtractor using AND,OR, NOT and EX-OR gates
4	RS and J-K flip flops
5	8-bit addition, Subtraction, Multiplication and Division
6	Sum of the series of 8-bit numbers
7	Sorting of numbers in ascending and descending order
8	Block data transfer using microprocessor 8085.

Text Book(s):

1. M.N. Srinivasan,S.Balasubramaniyan, R. Ranganathan, A text book of Practical Physics, S.Chand&Sons , Reprint 2010.

Reference Book(s):

1. C.C. Ouseph, U.J. Rao& V. Vijayendran, Practical physics and electronics, S. Viswanathan, Pvt,Ltd, First edition,2007.

Web Resource(s):

1. www.physicstutoruials.org
2. www.sciencelearn.org.nz

Course Outcomes

Upon successful completion of this course, the student will be able to:

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Remember the basic principles of Electricity, Heat and Electronics.	**K1**
CO2	Understand the experimental skills.	**K2**
CO3	Understand the characteristics of the semiconductor diodes, transistors and operational amplifiers.	**K2**
CO4	Analyze the Electricity and Electronics circuit construction.	**K4**
CO5	Evaluate the basic requirements for their higher studies.	**K5**

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	**3**	2	**1**	**2**	**3**	**2**	**2**	**2**	**3**	**2**	**2.2**
CO2	**3**	2	**3**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**2.3**
CO3	**3**	3	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**2.4**
CO4	**3**	2	**3**	**2**	**1**	**2**	**2**	**2**	**2**	**3**	**2.2**
CO5	**3**	2	**3**	**3**	**2**	**2**	**2**	**2**	**3**	**2**	**2.4**
Mean Overall Score											**2.3**
Correlation											Medium

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinators:

Dr. A. Mohamed Saleem

Dr. S. Abbas Manthiri

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UCS4GE2	Generic Elective – II	2	2	-	100	100

Course Title	Web Design

SYLLABUS

Unit	Contents	Hours
I	Introduction to the Internet – Computers in Business – Networking – Internet – E-Mail – Resource Sharing – Gopher – World Wide Web – Usenet – Telnet – Bulletin Board Service – *Wide Area Information Service*	6
II	Internet Technologies – Modem – Internet Addressing – Physical Connections – Telephone Lines – Internet Browsers – Internet Explorer – *Netscape Navigator*	6
III	Introduction to HTML – History of HTML – HTML Documents – Anchor Tag – Hyperlinks – Head and Body Sections – Header Section – Title – Prologue – Links – Colorful Web Page –*Comment Lines*.	6
IV	Designing the Body Section – Heading Printing – Aligning the Headings – Horizontal Rule – Paragraph – *Tab Settings* – Ordered and Unordered Lists – Lists – Unordered Lists – Ordered Lists.	6
V	Table Handling – Tables – Table Creation in HTML – HTML Forms – Attributes – Elements – HTML Input types – Attributes – *Forms*	6

…… Self Study

Text Book:

C. Xavier, World Wide Web Design with HTML, Tata McGraw Hill Company Limited, New Delhi, 19th Reprint 2008.

Reference Book(s):

1. Thomas A. Powell, HTML & XHTML, TMH, Fourth Edition, Thirteenth Reprint, 2007
2. N.P. Gopalan and J. Akilandeswari, Web Technology A Developer's Perspective, PHI, Second Printing, 2008

Web Resource(s):

1. https://www.geeksforgeeks.org/the-internet-and-the-web/
2. https://www.w3schools.com/html/default.asp

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	**CO Statement**	**Cognitive Level (K-Level)**
CO1	Recall the basics of the Internet	K1
CO2	Summarize the different Internet devices and their functions	K2
CO3	Identify the functions of HTML	K3
CO4	List the concepts of HTML for developing web page	K4
CO5	Choose Web Pages for real-world problems	K5

Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of COs
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	3	3	3	2	3	3	3	2	2	2	2.6
CO2	3	3	3	2	1	3	3	3	2	2	2.5
CO3	3	2	3	2	3	2	3	3	3	2	2.6
CO4	2	3	2	2	3	3	3	2	2	2	2.4
CO5	3	3	3	3	3	3	2	3	3	3	2.9
										Mean Overall Score	**2.60**
										Correlation	**High**

Mean Overall Score = Sum of Mean Score of COs / Total Number of COs

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

Course Coordinator: Dr. S. Mohamed Iliyas

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
IV	23UCN4EL	EXPERIENTIAL LEARNING	-	2	-	100	100
Course Title	Internship						

1.	At the end of Semester IV, during the summer vacation, the students should undergo an Internship in a reputed IT Company or in the IT Division of a reputed company after getting permission from the Department.
2.	The minimum number of days for an Internship will be 30 days.
3.	A Project Report and a Certificate of Attendance are to be submitted after completing the Internship for External Evaluation to the Department on the first day of Semester V.