SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi and Affiliated to Pondicherry University)

(Accredited by NAAC with 'A' Grade and Accredited by NBA-AICTE, New Delhi)

Madagadipet, Puducherry

Third Meeting of the Board of Studies

Department of Computational Studies

for the Programme

Bachelor of Data Science And Analytics

Venue

First Floor, SAS Block

Sri ManakulaVinayagar Engineering College

Madagadipet, Puducherry – 605 107

Date & Time

29-11-2023 & 02.30 pm to 4.00 pm

School of Arts and Science
Department of Computational Studies
Board of Studies Meeting for B.Sc. Data Science and Analytics

The Third meeting of Board of Studies for the course B.Sc. Data Science and Analytics was held through online on 29.11.2023 at 02:30 pm in the Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the Third Meeting of Board of Studies.

S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS
1	**Dr. N. MOGANARANGAN, M.E., Ph.D.** Professor & Head, Department of Computational Studies, School of Arts & Science, Sri Manakula Vinayagar Engineering College (Autonomous) Madagadipet, Puducherry 605 107 **E-mail: moganarangan.cse@smvec.ac.in** **Mobile: 98945 33661**	Chairman
2	**Dr. PUNAM BEDI M.Sc., M.Tech., Ph.D.** Professor, Department of Computer Science, University of Delhi, Delhi – 110 007. **Email: punambedi@gmail.com , Mobile:9899125785**	Pondicherry University Nominee
3	**Dr. R. AROKIA PAUL RAJAN MCA, PGDBA, MA, PhD.,** Associate Professor, Computer Science, School of Sciences, Bangalore Central Campus, Christ University, Bangalore, Karnataka. **Mail id: paulraajan@gmail.com** **Ph: 9443459242**	Subject Expert (Academic Council Nominee)
4	**Dr. M. DURAISAMY, MCA., M.Phil., Ph.D., TNSET.** Associate Professor and Head, Department of Computer Applications, Government Arts and Science College, Kariyampatti, Tirupattur, Tamilnadu - 635 901. **E-mail: duraimca78@gmail.com** **Mobile: 98431 55358.**	Subject Expert (Academic Council Nominee)
5	**Mr.E.IYYAPPAN,** Senior Application Developer, IQVIA, Bangalore. **E-mail: eiyyappan.mca@gmail.com** **Mobile:9790700670**	Member (Industry Representative)

Co-opted Expert Members		
6	**Dr. J. MADHUSUDANAN, ME., Ph.D.,** Professor and Head, Department of Artificial Intelligence and Data Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. **E-mail: madhu@smvec.ac.in** **Mobile: 9003739274**	Co-opted Expert Member
7	**Mr. M. SHANMUGAM, M.Sc., M.Phil., M.E., SET, (Ph.D).,** Associate Professor, Department of Computer Science Engineering, Sri Manakula Vinayagar Engineering College **E-mail: shanmugam.mm@smvec.ac.in** **Mobile: 9444370963**	Co-opted Expert Member
Internal Members		
8	**Mrs. A. SHAMSATH BEGAM, M.C.A.,** Assistant Professor, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. **E-mail: shamsathbegum.sas@smvec.ac.in, Mobile: 9500399774**	Internal Member
9	**Mr. K. SANTHOSHKUMAR, M.C.A. M.Phil. B.Ed.,** Assistant Professor Department of Computational Studies School of Arts and Science Sri Manakula Vinayagar Engineering College **Mail id: santhoshkumark.sas@smvec.ac.in** **Phone: 8508068040.**	Internal Member
10	**Dr. M.A. ISHRATH JAHAN M.A., M.Phil., Ph.D.,** Associate Professor & Head, Department of English, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. **E-mail: ishrath@smvec.ac.in** **Mobile: 9443075126.**	Internal Member
11	**Mr. P.KRISHNAMOORTHY M.Sc., M.Phil.,** Assistant Professor and Head, Department of mathematics, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. **E-mail: krishnamoorthymaths@smvec.ac.in** **Mobile: 9750028056.**	Internal Member

ANNEXURE – II

AGENDA OF THE MEETING

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.1

Welcome Address, Introduction about the Institution, Department, and BoS Members.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.2

To review and confirm the minutes of the Second meeting of the Board of Studies held on June 30,.2023.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.3

To discuss the curriculum and syllabi of (IV Semester) for revision and modifications if any.(R- 2020).

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.4

To discuss and approves the curriculum (I-IV semester) and syllabi (II semester) for B.Sc Data Science and analytics programme under Regulations R-2023.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.5

To discuss and approve the Academic calendar for the even semester (semester II, IV) of Academic year 2023-24.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.6

To Debate Admission eligibility criteria / norms to enroll as student in the specific programme as prescribed by UGC

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.7

To Conduct of Internal assessment test, model practical exams, award of internal assessment /Re Earn / Improvement / Evaluation Procedures.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.8

To appraise and approve the Discipline Specific Elective (DSE) and Skill Enhancement course (SEC) offered to the fourth semester (R - 2020) and Second Semester (R – 2023)

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.9

To propound the Department Research activities and to inform about the remarkable achievement of the Staff and Students.

Item No.: BoS/2023/SAS/UG/ B.Sc. Data Science and Analytics/3.10

Any other item with the permission of the Chair

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SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

B.Sc. Data Science and Analytics

Minutes of 3rd meeting of Board of Studies

ANNEXURE – I

ACADEMIC REGULATIONS 2020

(R 2020)

COLLEGE VISION AND MISSION

Vision

To be globally recognized for excellence in quality education, innovation and research for the transformation of livestoserve the society.

Mission

M1: Quality Education:

To provide comprehensive academic system that amalgamates the cutting edge technologies with bestpractices.

M2: **Research and Innovation:**

To foster value based research and innovation in collaboration with industries and institutions globally forcreating intellectuals with new avenues.

M3: Employability and Entrepreneurship:

To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values:

To instill deep sense of human values by blending societal righteousness with academic professionalism for thegrowth of society.

DEPARTMENT OF COMPUTATIONAL STUDIES

VISION AND MISSION

Vision:

To come up with successfully as a high-quality human capital in Computer Science and related areas for thesustainable growth of the IT industry needs of the country.

Mission:

M1: Innovative Skills:

Ensuring deeper understanding of fundamentals and acquiring innovative skills within core areas of ComputerScience.

M2: Motivated Graduates:

Producing highly skilled and motivated graduates with the ability of problem solving individually and in teams.

M3: Ethical Responsibilities:

Providing a deep awareness of our ethical responsibilities to our profession and to the society.

Annexure I

SEMESTER – I										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	Total
Theory										
1	A20TAT101/ A20FRT101	Tamil-I / French – I *	MIL	3	0	0	3	25	75	100
2	A20GET101	General English–I	ENG	3	0	0	3	25	75	100
3	A20DAT101	C Programming	DSC	4	0	0	4	25	75	100
4	A20DAT102	Data Structure and Algorithms	DSC	4	0	0	4	25	75	100
5	A20DAD101	Applied Probability and Statistics	IDC	3	1	0	4	25	75	100
Ability Enhancement and Compulsory Course										
6	A20AET101	Environmental Studies	AECC	2	0	0	2	100	0	100
Practical										
7	A20DAL101	C Programming Lab	DSC	0	0	4	2	50	50	100
8	A20DAL102	Data Structure and Algorithms Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20DAS101	Communication Skills Lab	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
10	A20DAC101	**Microsoft Excel**	EEC	0	0	4	0	100	0	100
							26	**525**	**475**	**1000**

SEMESTER – II										
S. No.	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20TAT202/ A20FRT202	Tamil- II / French – II *	MIL	3	0	0	3	25	75	100
2	A20GET202	General English-II	ENG	3	0	0	3	25	75	100
3	A20DAT203	C++ Programming	DSC	4	0	0	4	25	75	100
4	A20DAT204	Introduction to Big Data	DSC	4	0	0	4	25	75	100
5	A20DAD202	Statistics for Data Science	IDC	3	1	0	4	25	75	100
Ability Enhancement and Compulsory Course										
6	A20AET202	Public Administration	AECC	2	0	0	2	100	0	100
Practical										
7	A20DAL203	C++ Programming Lab	DSC	0	0	4	2	50	50	100
8	A20DAL204	Big Data Analytics Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20DAS202	Business Statistics	SEC	0	0	4	2	100	0	100
Extension Activities										
10	A20EAL201	National Service Scheme	EA	0	0	2	1	50	0	50
Employment Enhancement Course										
11	A20DAC202	Data Analytics	EEC	0	0	4	0	100	0	100
							27	**575**	**475**	**1050**

SEMESTER – III										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20DAT305	Database Management System	DSC	4	0	0	4	25	75	100
2	A20DAT306	Introduction to Data Science	DSC	4	0	0	4	25	75	100
3	A20DAE3XX	**Discipline Specific Elective–I**	DSE	3	0	0	3	25	75	100
4	A20DAD303	Linear Algebra	IDC	3	1	0	4	25	75	100
5	A20XXO3XX	**Open Elective–I**	OE	2	0	0	2	25	75	100
Practical										
6	A20DAL305	RDBMS Lab	DSC	0	0	4	2	50	50	100
7	A20DAL306	Python for Data Science Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20DAS303	Cloud Computing using Linux	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20DAC303	AWS Cloud	EEC	0	0	4	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER – IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20DAT407	NoSQL Databases	DSC	4	0	0	4	25	75	100
2	A20DAT408	Introduction of Artificial Intelligence	DSC	4	0	0	4	25	75	100
3	A20DAE4XX	**Discipline Specific Elective–II**	DSE	4	0	0	3	25	75	100
4	A20DAD404	Health Analytics	IDC	3	0	0	4	25	75	100
5	A20XXO4XX	**Open Elective–II**	OE	2	0	0	2	25	75	100
Practical										
6	A20DAL407	NoSQL Databases - Lab	DSC	0	0	4	2	50	50	100
7	A20DAL408	Artificial Intelligence (PROLOG) Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20DAS404	AWS Web Services	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20DAC404	Blockchain	EEC	0	0	4	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER – V										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20DAT509	Introduction to Machine Learning	DSC	4	0	0	4	25	75	100
2	A20DAT510	IoT Cloud and Data Analytics	DSC	4	0	0	4	25	75	100
3	A20DAT511	Software Project Management	DSC	4	0	0	4	25	75	100
4	A20DAE5XX	**Discipline Specific Elective–III**	DSE	3	0	0	3	25	75	100
Practical										
5	A20DAL509	Machine Learning Lab	DSC	0	0	4	2	50	50	100
6	A20DAP501	Mini Project	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20DAS505	R Programming Lab	SEC	0	0	4	2	100	0	100
Online Certification Course										
8	A20DAX501	NPTEL – Big Data Computing, Data Mining and Online Privacy	OCC	0	0	0	0	0	0	0
							21	**300**	**400**	**700**

SEMESTER – VI										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20DAT612	Deep Learning	DSC	**3**	0	0	4	25	75	100
2	A20DAT613	Data Handling and Visualization	DSC	**3**	0	0	4	25	75	100
3	A20DAT614	Text and Image Analytics	DSC	**3**	0	0	4	25	75	100
4	A20DAE6XX	**Discipline Specific Elective–IV**	DSE	**3**	0	0	3	25	75	100
Practical										
5	A20DAP602	Project Viva-Voce	DSC	**0**	0	10	5	40	60	100
Skill Enhancement Course										
6	A20DAS606	Research Methodology	SEC	**0**	0	4	2	100	0	100
							22	**240**	**360**	**600**

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SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

B.Sc. Data Science and Analytics

Minutes of 3rd meeting of Board of Studies

ANNEXURE - II

Annexure II

DISCIPLINE SPECIFIC ELECTIVE COURSES

ELECTIVES										
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Elective (DSE - I) – offered in Third Semester										
1	A20DAE301	Operating System	DSE	3	-	-	3	25	75	100
2	A20DAE302	Information Security	DSE	3	-	-	3	25	75	100
3	A20DAE303	Computer Networks	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - II) – offered in Fourth Semester										
1	A20DAE404	Infrastructure Management	DSE	3	-	-	3	25	75	100
2	A20DAE405	Client Server Technology	DSE	3	-	-	3	25	75	100
3	A20DAE406	Image Processing	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - III) – offered in Fifth Semester										
1	A20DAE507	Wireless Sensor Network	DSE	3	-	-	3	25	75	100
2	A20DAE508	Data Science using R	DSE	3	-	-	3	25	75	100
3	A20DAE509	Virtualization using Cloud	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - IV) – offered in Sixth Semester										
1	A20DAE610	Process Management	DSE	3	-	-	3	25	75	100
2	A20DAE611	Software Engineering	DSE	3	-	-	3	25	75	100
3	A20DAE612	Introduction to Digital Marketing	DSE	3	-	-	3	25	75	100

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SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

B.Sc. Data Science and Analytics

Minutes of 1st meeting of Board of Studies

ANNEXURE - III

ANNEXURE - III

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(B.A., B.Sc., B.Com., B.B.A. & B.C.A., ℘ς*f*♥÷⟩ϒ|©ℜζ∴ς♠ ¬℘ςμ⇑]>ς⊥)

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1. |⌈ς⊗℘], |., >τ∝ ∑ζκ_ √⌈ℜ⌋BΔ, ζ∴↔[℘]♥℘|Δ, κ*f*℘ωM, 1968.
2. •⊆>↔↔ς⇔[, … ℘….|ς. Eκ℘ς>•⊆>↔Δ. …⊗ς., >τα_ E→||> κ↔⌈ς→Δ κ⟨⌠⇓E∞Δ, ℜ⟩Bς, ¬⊗[| ♠, 1989.
3. ℘↔⊆>ς∴♠ς⌠, ∂.⌋., ∑_⌈ >τ∝ ♦⏎> …κ⌋|∴ς, ℘ς⟩Ω|⌈BΔ, ¬⊗[| ♠, 1998.
4. ℘ςℜ⌋B…∴⟩, κ| || ∴ …∑ςℜ⌋_ >τ∝ √⌈ℜ⌋B κ↔⌈ς→, ♦[.E.♦⇓. ℘]♥℘|Δ, ¬⊗[| ♠, 2011.
5. κ_oℜ|⌋□[, Aμℜ|σ|>λ[…>ςυ⊕ξΔ κ⟨⌠⇓E∞Δ, ∂[♠Δ, Eκ|≡| |, 1992.

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1. ⊗ℜ]…κ_, •., >τ∝ ¬∴ςα κ↔⌈ς→, ∴ς⟩ℜ|κς⊗|⌠ ℘]♥℘|Δ, E>Δ℘↔Δ, 1988.
2. Eυ÷ ℘ς⌈•♥↔∴⟩BΔ ∴υ→Δ ℵ⌈℘⇑∴∑ς℘[, A]B >τ∝ √⌈ℜ⌋B κ↔⌈ς→, ¬>ςζ]–1, 2, 3, ⊗ς⌋⇑]B ∂|ς>τ, Aμ¬*f*_o,2013.
3. ℘ς↔]Bς⌠, ℘ς↔]Bς⌠ |σ|>|⊥, ζ∴↔[℘]♥℘|Δ, ¬⊗[| ♠, 2011.

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http://www.tamilkodal.com
http://www.languagelab.com
http://www.tamilweb.com.

	FRENCH - I	L	T	P	C	Hrs
A20FRT101	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	3	0	0	3	45

OBJECTIVES

- To enable the students read, understand, and write simplesentences.
- To grasp relevant grammar forcommunication
- To learn about the land, people and culture ofFrance.

UNITÉ - 1

Je m'appelle Elise. Et Vous ?

Vous Dansez ? D'accord

Monica, Yukiko et compagnie

UNITÉ - 2

Les Voisins de Sophie

Tu vas au Luxembourg ?

UNITÉ – 3

Nous Venons pour l'inscription

A Vélo, en tain, en avoin

Pardon, monsieru,le BHV s'il vous plait ?

UNITÉ - 4

Au marche

On déjeune ici ?

UNITÉ - 5

On va chez ma copine ?

Chez Susana

Text Book

PrescribedTextbook : *FESTIVAL 1* - Méthode de Français
Authors : Sylvie POISSON-QUINTON
Michèle MAHEO-LE COADIC
Anne VERGNE-SIRIEYS
Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book : Festival 1

A20GET101	GENERAL ENGLISH I (Common to B.A., B.C.A. and B.Sc.)	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To recognize the rhythms, metrics and other musical aspects of poetry
- To read a variety of texts critically and proficiently
- To enable the students to enjoy the flair of literature through the work of great writer
- To make the students to know the functions of basic grammar and frame sentences without grammatical error
- To enable them understanding the intrinsic nuances of writing in English language

Course Outcomes

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

CO1 - Comprehend and discuss the various facets of selected poems.
CO2 - Analyze and interpret texts written in English.
CO3 - Read drama with graduate-level interpretive and analytical proficiency.
CO4 - Improve the fluency and formation of grammatically correct sentence.
CO5 - Enhance the writing skills for specific purposes.

UNIT I POETRY **(9 Hrs)**

1. John Milton: On His Blindness
2. William Wordsworth: Daffodils
3. Percy Bysshe Shelly: Ozymandias
4. Emily Dickinson: Because I could not stop for Death
5. Sarojini Naidu: The Queen's Rival

UNIT II PROSE **(9 Hrs)**

1. Francis Bacon: Of Love
2. Charles Lamb: A Dissertation upon Roast Pig

UNIT III DRAMA **(9 Hrs)**

1. Oscar Wilde: Lady Windermere's Fan

UNIT IV GRAMMAR **(9 Hrs)**

1. Parts of Speech
2. Tenses
3. Subject-Verb Agreement

UNIT V COMPOSITION **(9 Hrs)**

1. Essay Writing
2. Email

Text Books

1. "Brookside Musings: A Selection of Poems and Short Stories: Board of Editors", OrientLongman Limited, 2009
2. Wilde Oscar, "Lady Windermere's Fan. Published in The Importance of Being Earnest and Other Plays" London: Penguin, 1940. ISBN 0-14-048209-1.
3. Gale, Emily Dickinson's Because I could not stop for Death, Cengage Learning, 2015

Reference Books

1. Lalitha Natarajan and Sasikala Natesan, "English for Excellence: Poetry", Anuradha Publications, 2015
2. "Literary Pursuits: Board of Editors", Orient Longman Limited, 2015
3. "Literary Pinnacles: An Anthology of Prose and Poetry. Board of Editors", Orient Longman Limited, 2015
4. "The Approach to Life: A Selection of English Prose", Orient Longman Limited, 2009
5. JeetThayil," 60 Indian Poets", Penguin Books, 2008

Web References

1. https://poets.org/poem/because-i-could-not-stop-death-479
2. https://www.enotes.com/topics/an-astrologers-day
3. https://www.poetryfoundation.org/poems/46565/ozymandias
4. https://www.dltk-holidays.com/spring/poem/daffodils.htm
5. https://www.bartleby.com/4/313.html

A20DAT101	C PROGRAMMING	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To study about the algorithms and draw flowcharts in a language independent manner.
- To understand how to write modular, efficient and readable C programs
- To understand the concepts of creating and using Arrays of the C data types.
- To describe the techniques for creating program modules in C using functions.
- To study about creation of derived data types and perform operations on files and pointers.

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Course Outcomes

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

CO1 – Develop simple applications in C using different data types.
CO2 – Develop programs involving decision structures, loops, arrays and functions.
CO3 – Classify the difference between call by value and call by reference
CO4 – Design and develop programs using Pointers to understand the dynamics of memory.
CO5 – Understand the File management Operations and perform different file operations.

UNIT I INTRODUCTION TO C (12 Hrs)

Introduction to C Programming – Algorithm – Pseudo code – Flow chart – Basic Structure of C Program – Keywords and Identifiers – Data Types – Variables – Constants – Operators – Arithmetic Expressions – Type conversions – Input and Output operations.

UNIT II DECISION MAKING AND BRANCHING (12 Hrs)

Decision Making Statements: if statement, if-else, nested if-else statement, else if ladder and Switch Statement – Looping: While Loop, for loop, do-while loop – break and continue statement, go to statement.

UNIT III ARRAYS AND FUNCTIONS (12 Hrs)

Introduction to Arrays – Declaration of Array – one-dimensional array, two – dimensional array, multidimensional array – Functions: Introduction to Functions – Function Definition – Category of Functions – call by value, call by reference – Storage classes - auto, register, static, extern, arrays to functions.

UNIT IV STRING AND POINTERS (12 Hrs)

Strings – Declaring Strings – Reading and Writing strings – String Handling Functions – Pointers – Initialization of Pointer – Pointers Expressions – Pointer Arithmetic – pointers and arrays – array of pointers – pointer as function arguments – pointers to functions – Const Pointer – sizeof() operator.

UNIT V STRUCTURES,UNIONS AND FILE MANAGEMENT (12 Hrs)

C Structure – Structure Initialization – Arrays of Structures – Nested Structure – Structures and Functions – Unions – Concept of a file – File Management – input /output operations on files – Random access to file – Error handling in files.

Text Books

1. Balagurusamy. E, “Programming in ANSI C”, Tata McGraw Hill, 8th Edition, 2019.
2. Byron S Gottfried and Jitendar Kumar Chhabra, “Programming with C”, Tata McGraw Hill Publishing Company,4th Edition, New Delhi, 2015.
3. Herbert Schildt,” C: The Complete Reference”, McGraw Hill, 4th Edition, 2014.
4. Yashwant Kanetkar, “Let us C”, BPB Publications, 16th Edition, 2017.
5. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
6. The C Programming Language by Brian Kernighan and Dennis Ritchie 2nd edition.

Reference Books

1. Ashok N Kamthane, “Computer Programming”, Pearson education, Second Impression, 2012.
2. VikasVerma, “A Workbook on C “, Cengage Learning, 2rd Edition, 2012.
3. Dr. P. Rizwan Ahmed, “Office Automation”, Margham Publications, 2016.
4. P.Visu, R.Srinivasan and S.Koteeswaran, “Fundamentals of Computing and Programming”, 4th Edition, Sri Krishna Publications, 2012.
5. PradipDev, ManasGhoush, “Programming in C”, 2rd Edition, Oxford University Press, 2011.

Web References

1. https://www.programiz.com/c-programming
2. https://www.geeksforgeeks.org/c-language-set-1-introduction/
3. https://www.tutorialspoint.com/cprogramming
4. https://www.assignment2do.wordpress.com/.../solution-programming-in-ansi-c
5. https://nptel.ac.in/courses/106/104/106104128/
6. https://www.coursera.org/courses?query=c%20programming
7. https://www.udemy.com/course/c-programming-for-beginners-/

A20DAT102	DATA STRUCTURE AND ALGORITHMS	L	T	P	C	Hrs
		4	0	0	4	60

Course Objective

-
- To introduce the primary data structures and algorithms for their associated operations.
- To understand the applications of data structures.
- To learn the implementation issues of the data structures introduced.
- To understand the concepts of searching and sorting Techniques.
- To understand the basic concepts of stack, queue, List, Trees and Graphs

Course Outcomes

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

CO1 – Analyze algorithms based on time and space complexity.
CO2 – Implement and Apply linear data structures to solve simple problems.
CO3 – Represent and Apply Non-linear data structures to solve complex problems.
CO4 – Use Divide and conquer method to solve various problems.
CO5 – Use Greedy techniques to solve real time problem.

UNIT I INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS (12 Hrs)

Types of data structures - Abstract Data Type (ADT) - Analysis of algorithm - Time and space complexity - Recurrence relation - Asymptotic notation. Sorting - Searching.

UNIT II LIST ADT (12 Hrs)

Static and dynamic Representation – Types -Single Linked List-Doubly Linked List – Circular Linked List – Operations and Applications.

UNIT III STACK AND QUEUE ADT (12 Hrs)

Static and Dynamic Representation – Operations - Applications- Balancing Parenthesis- Evaluation of Arithmetic Expression- Infix to Postfix conversion. Queue ADT: Static and dynamic Representation – Linear queue — circular queue.

UNIT IV TREE ADT AND GRAPH ADT (12 Hrs)

Representation – Types - Binary Tree - Threaded Binary Tree - Binary Search Tree - Operation and Application. Graph: Representation — Types -Graph Traversal – Depth First Search - Breadth First Search –Application - Minimum cost spanning tree - Topological Sorting.

UNIT V ALGORITHM DESIGN TECHNIQUES (12 Hrs)

Divide and Conquer - General method – Finding Minimum Maximum – Merge Sorting - Greedy Method: General Method – knapsack problem – Single source shortest path – Dijkstras: Job sequencing.

Text Books

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, 4th Edition, Pearson Education, 2013.
2. E. Horowitz, S. Sahni and S. Rajasekaran, “Computer Algorithms/C++”, Second Edition, The Orient Blackswan,2019.
3. A Puntambekar, “Data Structures”, 3rd Revised Edition, Technical Publications Pune, 2008.

Reference Books

1. ReemaThareja, “Data Structures Using C”, Edition, Oxford University Press, 2017.
2. Gilles Brassard, “Fundamentals of Algorithms”, Pearson Education, 2015.
3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, “Data Structures and Algorithms”, Pearson Education, Reprint, 2006.
4. Ellis Horowitz, SartajSahni, Susan Anderson-Freed, “Fundamentals of Data Structures in C”, 2rd Edition, University Press, 2008.

Web References

1. https://www.geeksforgeeks.org/
2. http://opendatastructures.org/
3. https://nptel.ac.in/courses/106/106/106106127

A20DAD101	APPLIED PROBABILITY AND STATISTICS	L	T	P	C	Hrs
		4	0	0	4	60

Course objectives

- The concepts of discrete and continuous random variables, the probability distribution and density function.
- Evaluation of marginal and conditional distribution of multiple random variables.
- The concept of correlation and regression to find covariance.
- Evaluation of the given data for appropriate test of hypothesis.
- Analyzing the data for variance..

Course Outcomes

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

CO1 – Describe the continuous random variables and moments of Discrete and continuous random variables.
CO2 – Calculate probabilities and derive the marginal and conditional distribution of bivariate random variables.
CO3 – Apply the concept of correlation and regression to find covariance.
CO4 – Evaluate the given data for appropriate test of hypothesis.
CO5 – Test the data for analysis of variance.

UNIT I SINGLE RANDOM VARIABLES (12 Hrs)

Basic definitions of probability- Random Variables – Discrete and Continuous. Probability distributions, mass function/ density function of a probability distribution, mathematical expectation, moments about origin, central moments, skewness, Kurtosis. Moment generating function of probability distribution.

UNIT II PROBABILITY DISTRIBUTIONS (10 Hrs)

Binomial, Poisson, Normal, exponential and Gamma distributions -their Properties. Moment generating functions of the above distributions and hence find the mean and variance. Joint probability distributions- Joint probability mass /density function, Marginal probability, mass / density functions.

UNIT III CORRELATION & REGRESSION SAMPLING DISTRIBUTIONS (14 Hrs)

Coefficient of correlation, the rank correlation, Covariance of two random variables. Regression Coefficient, The lines of regression and multiple correlation & regression Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance. Parameter estimation- Point estimation and interval estimation.

UNIT IV TESTING OF HYPOTHESIS - I (14 Hrs)

Testing of hypothesis: Null hypothesis, Alternate hypothesis, Type I& Type II errors – critical region, confidence interval, Level of significance. One sided test, Two sided test. Large sample tests:
(i) Test of Equality of means of two samples, equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
(ii) Tests of significance of difference between sample S.D and population S.D.
(iii) Tests of significance difference between sample proportion and population proportion, difference between two sample proportions.

UNIT V TESTING OF HYPOTHESIS-II (10 Hrs)

Student t-distribution, its properties; Test of significance sample mean and population mean, difference between means of two small samples. Snedecor's F- distribution and its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.

Text Books

1.B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.
2.Probability and Statistics for Engineers by Richard Arnold Johnson, Irwin Miller and John E. Freund, New Delhi, Prentice Hall.
3.Probability and Statistics for Engineers and Sciences by Jay L. Devore, Cengage Learning.

Reference Books

1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. Fundamentals of Mathematical Statistics by S.C. Guptha &V.K. Kapoor, S. Chand
3. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press.

Web References

1. https://www.efunda.com/math/math_home/math.cfm
2. https://www.ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

A20AET101	ENVIRONMENTAL STUDIES (Common for all B.A.,B.Sc.,B.Com., B.B.A,B.C.A.)	L	T	P	C	Hrs
		2	0	0	2	30

Course Objectives

- To gain knowledge on the importance of natural resources and energy.
- To know the structure and function of an ecosystem
- To imbibe an aesthetic value with respect to biodiversity, understand the threats and its conservation andappreciate the concept of interdependence
- To know the causes of types of pollution and disaster management
- To observe and discover the surrounding environment through field work.

Course Outcomes

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

CO1 – Understand about the various resources
CO2 – Learn about the biodiversity
CO3 – Learn the different types of pollution and to prevent the pollution
CO4 – Know about the pollution Act
CO5 – Observe various environmental issues in surroundings

UNIT I INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES (6 Hrs)

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact -fertilizer - Pesticide Problems - case studies.

UNIT II ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION (6 Hrs)

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem. Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) andlocal levels - Hotspots, threats to biodiversity - conservation of biodiversity – Insitu & Exsitu.

UNIT III ENVIRONMENTAL POLLUTION AND MANAGEMENT (6 Hrs)

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Landslides. Role of individuals in prevention of pollution - pollution case studies.

UNIT IV SOCIAL ISSUES - HUMAN POPULATION (6 Hrs)

Urban issues - Energy - water conservation - Environmental Ethics - Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UNIT V FIELD WORK (6 Hrs)

Visit to a local area / local polluted site / local simple ecosystem - Report submission REFERENCES

Text Books

1. BharuchaErach, “Textbook of Environmental Studies for Undergraduate Courses”, Telangana, India:Orient Black Swan, 2rd Edition, 2013.
2. BasuMahua, Savarimuthu Xavier, “SJ Fundamentals of Environmental Studies”. Cambridge,United Kingdom: Cambridge University Press, 2017.
3. Agarwal, K.C “Environmental Biology”, Nidi Publ. Ltd. Bikaner, 2001 .

Reference Books

1. Kumarasam.K., A. Alagappa Moses AND M.Vasanthy, “Environmental studies”, Bharathidasanuniversity pub, 1, trichy2004.
2. Rajamannar, “Environmental studies”, EVR College PUB, Trichy 2004.
3. Kalavathy, S. (ED.),“Environmental Studies”, Bishop Heber College PUB., Trichy 2004.

Web References

1. https://www.youtube.com/watch?v=78prsPYm98g
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2792934/
3. https://www.frontiersin.org/articles/505570

A20DAL101	C PROGRAMMING LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To familiarize with C programming constructs.
- To develop programs in C using basic constructs.
- To develop programs in C using arrays.
- To develop applications in C using strings, pointers, functions.
- To develop applications in C using structures.
- To develop applications in C using file processing.

Course Outcomes

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

CO1 – Apply the various basic programming constructs.
CO2 – Develop C programs for simple applications making use of basic constructs, arrays and strings.
CO3 – Develop C programs involving function.
CO4 – Design applications using pointers, and structure.
CO5 – Apply concept of file management.

List of Exercises

1. Write a program to initialize, assignment & printing variables of different data types.
2. Write a program to demonstrate arithmetic operators and logical operators.
3. Write a Program to read marks of students in five subjects and print results using decision statements.
4. Write a program to print prime numbers in the given range.
5. Write a program to print minimum and maximum elements using 1D array.
6. Write a program to perform matrix addition and matrix subtraction using 2D array.
7. Write a program to verify the given string is palindrome or not.
8. Write a program to find product of two numbers using functions with arguments, with return type.
9. Develop program to illustrate pointers and Structure.
10. Develop programs for file operations.

Reference Books

1. Zed A Shaw," Learn C the Hard Way: Practical Exercises on the Computational Subjects You KeepAvoiding (Like C)", Addison Wesley, 2016.
2. Anita Goel and Ajay Mittal, "Computer Fundamentals and programming in C", 1st Edition, PearsonEducation , 2011.
3. Yashwanth Kanethkar, "Let us C", 13th Edition, BPB Publications, 2008.
4. Maureen Sprankle, Jim Hubbard," Problem Solving and Programming Concepts," 9th Edition, Pearson,2011.
5. E. Balaguruswamy, "Programming in ANSI C", 8th Edition, 2019, McGraw Hill Education, ISBN: 978-93-5316-513-0

Web References

1. https://alison.com/course/introduction-to-c-programming
2. https://www.geeksforgeeks.org/c-programming-language/
3. http://cad-lab.github.io/cadlab_data/files/1993_prog_in_c.pdf
4. https://www.tenouk.com/clabworksheet/clabworksheet.html
5. https://fresh2refresh.com/c-programming/
6. http://www.skiet.org/downloads/cprogrammingquestion.pdf

		L	T	P	C	Hrs
A20DAL102	**DATA STRUCTURE AND ALGORITHMS LAB**	**0**	**0**	**4**	**2**	**30**

Course Objectives

- Ability to identify the appropriate data structure for given problem.
- To learn about the concepts of Searching and Sorting.
- Identify suitable data structure to solve various computing problems
- To study about the linear and non-linear Data Structures.
- To learn about the concepts of ADT including List, stack and Queues

Course Outcomes

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

CO1 – Use appropriate data structure for given problem.
CO2 – Solve the given problem by identifying the appropriate Data Structure.
CO3 – Solve problems in linear and non-linear Data Structures.
CO4 – Develop programs using various searching methods.
CO5 – Sole the problems using Linked List.

List of Exercises

1. Write programs for implementing Linear searching techniques to arrange a list.
2. Write programs for implementing Bubble sort sorting techniques to arrange a list.
3. Design and implement Stack and its operations using List.
4. Design and implement Queue and its operations using List.
5. Uses Stack operations to convert infix expression into postfix expression.
6. Write programs for the following operations on Single Linked List.
   (i) Creation (ii) insertion (iii) deletion (iv) traversal
7. Write programs for the following operations on Circular Linked List.
   (i) Creation (ii) insertion (iii) deletion (iv) traversal
8. Write a Python program to implement Stack using linked list.
9. Write a program to perform the following operation using binary search tree:
   (i). Create a binary search tree.
   (ii). Traverse the above binary search tree recursively in pre-order, post-order and in-order.
   (iii). Count the number of nodes in the binary search tree.
10. Write programs to implement the following graph traversal algorithms using depth first search.

Reference Books

1. Rance D. Necaise, “Data Structures and Algorithms using Python”, Wiley, John Wiley &Sons,INC., 2011.
2. Benjamin Baka, David Julian, “Python Data Structures and Algorithms”, Packt Publishing Ltd.,2017,
3. Ellis Horowitz, SartajSahni, ”Fundamentals of Data Structures”, Illustrated Edition, Computer Science Press, 2018.

Web References

1. https://docs.python.org/3/tutorial/datastructures.html
2. http://interactivepython.org/runestone/static/pythonds/index.html
3. http://www.tutorialspoint.com/data_structures_algorithms
4. http://www.geeksforgeeks.org/data-structures/

A20ENS101	COMMUNICATION SKILLS LAB	L	T	P	C	Hrs
		0	0	4	2	30

(Common to B.A., B.Sc., B.Com., B.B.A.& B.C.A.)

Course Objectives

- To improve the students' speed in reading.
- To decode the correspondence between sound and spelling in English.
- To train students to organize, revise and edit ideas to write clearly and effectively.
- To enhance the sense of social responsibility and accountability of the students.
- To expound the significance of time and stress management.

Course Outcomes

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

CO1 – Understand the pattern to communicate effectively.
CO2 – Impart Speaking skills with confidence.
CO3 – Use writing strategies to improve their drafting skills and comprehending of articles.
CO4 – Demonstrate leadership qualities to Participate in Group Discussion and Interview efficiently.
CO5 – Expertise in Managerial skills.

UNIT I COMMUNICATION SKILLS SPEAKING (6 Hrs)

Aspects of speaking - Process and techniques of effective speech – Presentations - topic to be given to students forshort speech.

UNIT II SELF - MANAGEMENT SKILLS (6 Hrs)

Time Management - Stress management – Perseverance – Resilience - Mind mapping –Self- confidence

UNIT III COMMUNICATION SKILL – READING (6 Hrs)

Phonics – Self-Introduction – Vocabulary – Comprehension - skimming and scanning.

UNIT IV SOCIAL SKILLS (6 Hrs)

Negotiation and Persuasion – Leadership – Teamwork – Problem solving – Empathy – Decision making.

UNIT V COMMUNICATION SKILL – WRITING (6 Hrs)

Descriptive – Narrative – Persuasive – Expository – Picture composition

Text Books

1. Syamala, V," Effective English Communication for you", Chennai: Emerald Publishers, 2002
2. Balasubramanian, T," A Textbook of English Phonetics for Indian Students",New Delhi: TrinityPress 1981
3. Sardana, C.K.," The Challenge of Public Relations",New Delhi: Har- Anand Publications,1995.

Reference Books

1. Morley, David and Philip Neilson, editors", The Cambridge Companion to Creative Writing",Cambridge: 2012.
2. Eastwood, John,"Oxford Grammar", Oxford University Press, 1999.
3. Prasad, Hari Mohan," A Handbook of Spotting Errors:" McGraw Hill Education, 2010.
4. Murphy, John J, "Pulling Together: 10 Rules for High-Performance Teamwork", SimpleTruths, 2016.

Web References

1. www.softwaretestinghelp.com
2. www.businessballs.com
3. www.teachingenglish.org.uk
4. www.teachingenglish.org.uk
5. www.monster.com

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(B.A., B.Sc., B.Com., B.B.A., & B.C.A. ℘ς*f*♥÷⟩ϒ|©ℜζ.∴ς♠ ¬℘ςμ⍓>ς⊥)

	L	T	P	C	Hrs
A20TAT202	3	0	0	3	45

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- >τ∝ √⌈ℜ⌡BΔ χ⊥⟨*f*ℜ|⍓]KΔ, κ|κ⍓]KΔ ¬ ℘υ⊕ ∴ςυ⊕≡|⊥, ∂>[E⊆>| ♠|⊥,∂| *f*Bς⟨≡|⊥γ⌡Bκυ| ⊕ |⌠⊆ …>ς→Δ ♦↵⌡>♥ ℘®*f* √⌈ℜ⌡B≡|≠[καBς|ℜ⦃→κ>υζ √♥ ℘ς*f*⍓]®*f*Δ ∂| ∴ℜ|♥ ℘®|⊥⟨μ.
- ¬.∴ςαλ[|®*f*| ∴♥| ℘♥ A⟍⊆μ¬|ς⊥κ>υζ °μκς| ℘ς*f*⍓]®*f*Δ κ|κ| ∴ℜ|♥ ℘®|⊥⟨μ.
- κς∝σB_ E⊆>| ♠|⊥, ∈↵ℜ|σB_ …|ς® ℘ς||⊥, ⊗∴⍓μκΔ, ⌠ωoB_ ♦♠♥ ℘⌈⦃→||⟨ ∴ς□κ⌈|©ℜζ ♦|⍓μ| ↔ℜζΔ σ>⍓]_ √♥ ℘ς*f*⍓]®*f*Δ χ⌡κςℜ|♥ ℘®|⊥⟨μ.
- E⊆>| ♠ γυ⊕|⌈♥ ¬ ℘⌡ℜζκ>υζ⍓ >ςΦ¬∴ςαλ[℘≡|≠♥÷| ♠ χ□⌈⍓> √♥ ℘ς*f*⍓]®*f*Δ ∂| ∴ℜ|♥ ℘®|⊥⟨μ.

℘ς*f*⍓]®*f*⍓][¬κ≠♥ ℘ς|⊥

CO1 – √⌈ℜ⌡B≡|⊥ |ς®|Δ κς∝σB_ ¬∑ξ| ⊕||⟨♥ … ℘⟍∑*f*⍓>_.
CO2 – ∑∴μ ♦⌡□⍓|> ¬κ≠♥ ℘|⍓μΔ |⌡σBς|⍓ >ςΦ¬∴ςα| B♥ ℘B[℘|⍓μ>_.
CO3 – >|κ_ ¬>ς*f*⌈Aℜζ⍓ >ςΦ¬∴ςαλ[ξℜ⌡B⍓μκ⍓|> χ□⌈>_.
CO4 – >ςΦ¬∴ςαλ[E⊕♥| ℘ ∂>_.
CO5 – √⌈ℜ⌡B √[℘≡||⟨O|⌡Δ]⊕[||⟨κ⟨⌈⍓>_.

∂⌈ζ□1 **(9 Hrs)**

1. ♦®|⍓¬>ς| |: 1.ζ→⊆¬>ς| | (℘*f*_□130) 2. ∑υ↓□ (℘ς*f*_□27) 3. ∂|∑ς⌋→ (℘ς*f*_□86).
2. ℘⍓μ♥ ℘ς®|: E→℘ς□ςυ→♥ ℘|*f* (∂| |⊥□126□143).
3. ℘]¬♠⌡ □∝ℜ|□ℜζ: ⌡ℜζ⊕⊥□ ¬κζ⟨ς| ∴ (∂]|ς↔Δ□31), |ς>_ E⊕♥A|↔⍓>_ (∂]|ς↔Δ−113).

∂⌈ζ□2 **(9 Hrs)**

1. ♦®|⍓¬>ς| |: 1. ν≡ζ→±→ (℘ς*f*_□203), 2. |o⍓¬>ς| |□ ℘ς|⌈⍓]| □ (℘ς*f*_□9), 3. A⊕∑ς⌋→ (℘ς*f*_□235).
2. ℘⍓μ♥ ℘ς®|□ ξ_⌋⌈♥ ℘ς®| (6□21).
3. ℘]¬♠⌡ □∝ℜ|□ℜζ :
   1. ∑ς⌈|Bς⌈ □ ∑_⌈ς⌈ ♦♠⍓>ς[(221) .
   2.]⟍||Δ□ …|ς⌈⇒E κς↵Δ ζ|∞Δ (33).
      3. √MB| κ ∑ςυ ℘μ□ ζωσ >⟨⌈∑| *f* (14).
   4. |ς⌈ ∑ςυ ℘μ□ ∑⌈τζ |ς⌈⍓]| | (26).
      5. |⟨κα ∑ςυ ℘μ□|κ⟨≡¬|ς⊥ Bς| ♠ (14).

∂⌈ζ□3 **(9 Hrs)**

|⊗κΔ□ ℘[M⌡]⌡ξ| ⊕|⊥

1.]⌡Θς♠⊗Δ℘⊆>⌈ □ …κ∞→ …>ς≠℘≡|[(√↔⌡ *f*ςΔ]⌡ξ| ⊕).
2.]⌡∑ςϒℜ|↔⊗⌈ □ ∴♠¬.∴∠Δ …>ς⟍ (∑ς[|ςΔ]⌡ξ| ⊕).
3. •⊆>↔⌈ □ °α| ⊗Bς Φ √| ⊗♥ ℘B♠ςΦ (°ωςΔ]⌡ξ| ⊕).
4. ∴ς⟍ℜ|κς⊗|⌈ □ γ]∞Δ ∂⊆>ξΔ √_⌈ς (]⌡¬κΔ℘ς| κ).
5.]⌡ϑ⌈⌈ □ ∂[A Eκ Δ √↔⌡|(]⌡∴⊆]↔Δ).

|κ□κΔ □ ∑ς⌈ςλ↔⍓]⊄σB♥ ÷↔℘⊆>Δ

1. …℘Bς∝κς⌈ □]⌡ℜ|⌡ …*f*[¬℘ς[…∴M....
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3. ¬>ς∫ *f*↔|♥¬℘ς|γ∝κς⌠ □ ℘⇓|⊗∴ς∴|⌠ … ℘ς_....
4. γ∫ *f*ς⊥ □ |∫♥↓↔Δ ∑ς→…∴ς? |∴⌠♥↓....
5.]∫∴≡| |Bς∝κς⌠ □ κς|…♠[κς| κ∫⊆]…♠[....

√|⌠ςτBΔ

⌠⊕ς♥A↔ς□Δ□ ℘ς*f*_ Ω[⊕ ÷|□ ∴ς∠ℜζ♥...5 ℘ς*f*_|⊥ (℘ς*f*_ ♦∫|⊥ 61□65).

∫∫⇑μκΔ

√↔®⊗∫ B Bς⇑Z|Δ□ || *f*]⊕♥A♥ ℘*f*⌠Δ □5 ℘ς*f*_|⊥ (℘ς*f*_ ♦∫|⊥: 3,9,10,15,16).

∂⌠ζ – 4 **(9 Hrs)**

>τ∝ √⌠ℜ∫B κ↔⌠ς→

1. ⊗≡| √⌠ℜ∫B≡|⊥ 2. ℵ] √⌠ℜ∫B≡|⊥ 3. ℘ℜ] √⌠ℜ∫B≡|⊥ 4. |ς♥÷B≡|⊥.

∂⌠ζ□5 **(9 Hrs)**

E→||>|⊥

1. Aμ| ∴÷⇑>[□ ∂|o| |
2. ∑ς. ÷⇓⊗ϑ⌠⇑] □ …κ♥ ℘ ∴↔Δ
3. ∂∫⌠[□ ∈∫ …κ|⟨⇓…⊗ς→
4. |.∑ς|↔ς⇔[□ ℘⇓⊗ℜ ζ]|↔
5. ∫.↔ς⇔∑ς↔ςB□[□ |>ϒ
6. ⊗ς.|⊆>⊗ςτ □ >ℜ||λ[*μ ∑ς[ζ |∫|⊥
7. γ∫ *f*ς⊥ ÷⟩B>⌠×M□ ∴ς⇑]|↔
8. κ∫□>ς⊗[□ ∈∫ χ_⌠ς⊗♥ ℘B□Δ
9. •. >τ∝⇓¬⊗_κ[– ¬κλ…⌠ς| …℘ςΦ
10. ℘ς↔>…>σ – ∴ς♥÷⊥|⟨ σ∫⊆μ

℘ς⌠|κ±_|⊥:

1. ∂↔•, T., √∫℘>ςΔ ±υ⊕ς∫|E→||>|⊥±→, ∂|*f*Bς⟨Δ ℘]♥℘|Δ,]∫⇓E, 2013.
2. ∂∫□ς⇓⊗⌠Δ, ℘ς., ℘ℜ] √⌠ℜ∫B≡|⊥, ℘ς⟩Ω|⌠BΔ, ¬⊗[| ♠, 2010.
3. >τω∫□_, A]B …∑ςℜ∫_>τ∝ √⌠ℜ∫B κ↔⌠ς→, *♠ς®E A⇑>| Ω|⌠BΔ, ∴μ|↔, 2000.
4. ℘ςℜ∫B…∴⟩, κ|||∴ …∑ςℜ∫_>τ∝ √⌠ℜ∫B κ↔⌠ς→, ♦[.E.÷.♦⇓. ℘]♥℘|Δ, ¬⊗[| ♠, 2011.
5. ℘•℘], ∴ς. …κ., ¬⊗Δ¬∴ςα⇑ >τ∝ √⌠ℜ|□√⌠ℜ∫B≡|⊥, >τ∝♥ ℘_||⌠ℜ|ω|Δ, 2010 .

χ|↔Σ|*f*±_|⊥:

1. ∂[A, ℘ς., ∴ς.¬℘ς.E λ[∈∫ √⌠ℜ∫B±_|⊥∈∫ ∴]♥←|, χ⌠| >τ∝ γ↔ςΦ⇓E Ω→κ♠Δ, ¬⊗[| ♠, 1983.
2. ÷⊥|⟨, …|….|., >τω| κ↔⌠ς→Δ ∴ℜ|©Δ ℘∫ ℘ς|Δ, χ⌠| >τ∝ γ↔ςΦ⇓E Ω→κ♠Δ, ¬⊗[| ♠, 2000.
3. ¬⇔B…∴ς|[, ∑T♠ √⌠ℜ∫B ∂ξ|Δ, χλ⌠¬∴Φ ℘]♥℘|Δ, ¬⊗[| ♠, 1995.

√|□B⇑>⟨≡|⊥:

http://www.tamilkodal.com
http://www.languagelab.com
http://www.tamilweb.com

	FRENCH – II	L	T	P	C	Hrs
A20FRT202	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	**3**	**0**	**0**	**3**	**45**

OBJECTIVES

- To enable the students read, understand, and write simple sentences.
- To grasp relevant grammar for communication
- To learn about the land, people and culture of France.

UNITÉ – 1 **(9 Hrs)**

Qu'est -ce qu'on leur offre ?
On solde !
Découvrir Paris en bus avec l'open Tour

UNITÉ – 2 **(9 Hrs)**

Si vous gagne vous ferez quoi
Parasol ou parapluie ?

UNITÉ – 3 **(9 Hrs)**

Quand il est midi á Paris
Vous allez Vivre
L'avenir du Français

UNITÉ – 4 **(9 Hrs)**

Souvenirs d'enfance
j'ai fait mes études á Lyon 2

UNITÉ – 5 **(9 Hrs)**

Retour des Antilles
Au voleur ! Au voleur

TextBooks

PrescribedTextbook : *FESTIVAL 1* - Méthode de Français
Authors : Sylvie POISSON-QUINTON
Michèle MAHEO-LE COADIC
Anne VERGNE-SIRIEYS
Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book

Festival 1

		L	T	P	C	Hrs
A20GET202	**GENERAL ENGLISH- II**	**3**	**0**	**0**	**3**	**45**

(Common to B.A, B.Sc. and BCA)

Course Objectives

- To recognize poetry from a variety of cultures, languages and historic periods
- To develop the intensive study of language by critical reading
- To identify the various genres and analyze the works of writers in English
- To expand the basic understanding of targeted grammatical structures
- To understand the conventions of writing in English

Course Outcomes

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

CO1 – Understand and appreciate poetry as a literary art form.
CO2 – Comprehend and recognize relationship between ideas, events and facts.
CO3 – Learn to explore characters and their conflicts, dilemmas and extend their response to stories.
CO4 – Apply grammatical structures meaningfully and appropriately in oral and written form.
CO5 – Write effectively and coherently.

UNIT I POETRY (9 Hrs)

1. Lord Byron: She Walks in Beauty
2. Robert Frost: Stopping by Woods on a Snowy Evening
3. Nissim Ezekiel: Night of the Scorpion
4. Rabindranath Tagore: Where the Mind is Without Fear

UNIT II PROSE (9 Hrs)

1. Ernest Hemingway-A Day's Wait
2. Anton Chekhov: The Lottery Ticket

UNIT III FICTION (9 Hrs)

1. Jane Austen - Pride and Prejudice

UNIT IV GRAMMAR (9 Hrs)

1. Voice – Conditionals - Coherence

UNIT V COMPOSITION (9 Hrs)

1. Letter Writing
2. Report Writing

Text Books

1. Wisdom and Experience: An Anthology for Degree Classes. Board of Editors", Orient Longman Limited, 2007
2. "The Approach to Life: A Selection of English Prose", Orient Longman Limited, 2009.
3. "Brookside Musings: A Selection of Poems and Short Stories: Board of Editors", Orient, Longman Limited,2009.

Reference Books

1. Lalitha Natarajan and Sasikala Natesan, "English for Excellence: Poetry", Anuradha Publications Literary

Pursuits: Board of Editors, Orient Longman Limited, 2015.
2. S.C. Gupta, “English Grammar & Composition”, Arihant, 2014
3. Rabindranath Tagore, Where the mind is without fear “,London : The India Society,1912.
4. Raymond Murphy and Surai Pongtongcharoen, “English Grammar in Use”, Cambridge University, 1985.

Web References

1. https://poets.org/poem/she-walks-beauty
2. https://www.poetryfoundation.org/poems/46467/the-flea
3. https://www.classicshorts.com/stories/lottery.html
4. http://short-storylovers.blogspot.com/2012/07/thief-by-ruskin-bond.html
5. http://www.gutenberg.org/files/1342/1342-h/1342-h.htm

A20DAT203	C++ PROGRAMMING	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To understand the Fundamentals of Computers and introduction to C++ language.
- To study about functions in C++.
- To understand the Class and Objects.
- To understand the constructor and operator overloading
- To study about Inheritance and Files.

Course Outcomes

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

CO1 – Describing the basic introduction about C++ programming.
CO2 – Incorporating the use of functions.
CO3 - Develop the programming structure using class and objects.
CO4 - Design and develop programs using constructor and operator overloading.
CO5- Understand the File management concepts.

UNIT I BASICS OF C++

(12 Hrs)

Introduction to OOP – Basics components of C++ - Program and program Structure – Compiling and Executing C++ program – Difference between Procedural Oriented Language and Object Oriented Language – Benefits of OOP – Applications of OOP.

UNIT II FUNCTIONS

(

12 Hrs)

Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Function – Default Arguments – Constant Arguments – Function Overloading – Friend Function – Virtual Function – Math Function – Library Function.

UNIT III CLASS AND OBJECTS

(

12 Hrs)

Introduction – Specifying a Class – Defining Member Function – Nesting of Member Function – Private Member Function – Arrays within a Class – Memory Allocation for Objects – Static Data Members – Arrays of Objects – Objects as Function Arguments.

UNIT IV CONSTRUCTOR AND OPERATOR OVERLOADING

(

12 Hrs)

Introduction – Constructor – Parameterised Constructor – Multiple Constructor in a Class – Constructor with Defau;t Arguments – Copy Constructor – Dynamic Constructor – Destructor – Operator Overloading – Unary Operators – Binary Operators – Type Conversions – Concept of Exception Handling.

UNIT V INHERITANCE, POLYMORPHISM AND POINTERS

(

12 Hrs)

Introduction to Inheritance – Types of Inheritance – Abstract Class – Introduction to Pointers - Pointers to Objects – this Pointer – Pointers to Derived Classes – C++ Stream Classes – Working with Files – Opening and Closing Files – Detecting End of File – Template – Class Template and Function Template.

Text Books

1.E. Balagurusamy, “Object Oriented Programming with C++”, McGraw Hill, 7th Edition, 2018.

2. Herbert Schildt, “C++ - The Complete Reference”, McGraw Hill Education, 4th Edition, 2017.

3. Robert Lafore “Object-Oriented Programming in C++” Fourth Edition ,

Reference Books

1. Herbert Schildt, “C++ - From the Ground Up”, McGraw Hill Education, 2nd Edition, 2010.
2. Thomas L. Floyd, “Electronic Devices”, 9thEdition, Pearson Education, 2012.

Stanley B. Lippman, Stanley Lippman, Barbara Moo, “C++ Primer”, Addison-Wesley Professional, 5thEdition2012.

Web References

1. https://www.tutorialspoint.com/cplusplus/index.htm
2. http://www.cplusplus.com/doc/tutorial/
3. https://www.w3schools.com/cpp/
4. https://www.javatpoint.com/cpp-tutorial

5.https://www.geeksforgeeks.org/cpp-tutorial/

A20DAT204	INTRODUCTION OF BIG DATA	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To understand the Fundamentals of Big Data.
- To study the basic terminologies of C language and arrays
- To understand the Functions, Structures and Unions.
- To understand the concepts of Pointers.
- To study about File Management Operations in C.

Course Outcomes

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

CO1 – Describing the basic introduction about Big Data.

CO2 - Incorporating the use of sequential, selection and repetition control structures into a program.

CO3 - Develop the concepts of looping and arrays.

CO4 - Design and develop programs using Functions and Pointers.

CO5- Understand the File management Operations and Pre-processor Directives.

UNIT I INTRODUCTION TO BIG DATA *(12 Hrs)*

Introduction **–** Distributed File System – Big Data and its importance - Characteristics of Big data - Limitation of Conventional Data Processing - Need of big data frameworks - Big data analytics - Limitations of Big Data and Challenges - Big data applications.

UNIT II HADOOP *(12 Hrs)*

Basic concepts of Hadoop and its features – The Hadoop Distributed File System(HDFS) – Anatomy of Hadoop Cluster and its Modes – Hadoop Architecture – Hadoop Storage – Hadoop Daemons – Interacting HDFS using commend-line – HDFS using Java – Data Flow – Blocks – YARN.

UNIT III DATA COLLECTION AND TRANSMISSION *(12 Hrs)*

Big data collection – Strategies – types of data sources – collection Methods – Log files – sensors – Method for acquiring network data – Specialized network monitoring software – Mobile Equipment – Transmission methods-issues

UNIT IV HIVE *(12 Hrs)*

Introduction - Hive features – Hive architecture – Hive Meta store – Hive data types – Hive Tables – Table types - Creating database, Altering Database, Create table, Alter table, Drop Table, Built-in Functions - Built-in Operators, User Defined Functions.

UNIT V BIG DATA PRIVACY AND APPLICATIONS *(12 Hrs)*

Data Masking – Privately identified Information (PII) – Privacy Preservation in Big Data – Popular Big Data Techniques and tools – Applications – Social Media Analytics Fraud Detection

Text Books

1. Bart Baesens, “Analytics in a Big Data World: The Essential Guide to Data Science and its Applications’, John Wiley & Sons, 2014.
2. Tom White “ Hadoop: The Definitive Guide” Third Edit on, O’reily Media, 2012.
3. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.
4. Min Chen. Shiwen Mao, Yin Zhang. Victor CM Leung, Big Data: Related Technologies, Challenges and Future Prospects, Springer, 2014.

Reference Books

1. Boris lublinsky, Kevin t. Smith Alexey Yakubovich, “Professional Hadoop Solutions”. Wiley, ISBN : 9788126551071, 2015.
2. Chris Eaton, Dirk Deroos et al., “Understanding Big Data”, McGraw Hill , 2010.
3. Tom White, “HADOOP” : The definitive Guide”, O Reilly 2012.
4. Srinath Perera, Thilina Gunarathne, "Hadoop MapReduce Cookbook", PACKT publishing, 2013.

Web References

1. https://www.tutorialspoint.com/big_data_analytics/index.htm
2. https://www.tutorialspoint.com/hadoop/hadoop_big_data_overview.htm
3. https://www.javatpoint.com/big-data-characteristics
4. https://www.techtarget.com/searchdatamanagement/The-ultimate-guide-to-big-data-for businesses
5. https://www.guru99.com/bigdata-tutorials.html

		L	T	P	C	Hrs
A20DAD202	**STATISTICS FOR DATA SCIENCE**	**4**	**0**	**0**	**4**	**60**

Course Objectives

- To understand the basic descriptive statistics.
- To study about the hypothesis testing.
- To understand the Bayesian Inference and Functions.
- To understand the concepts of Regression and Probability.
- To study about Frequentist Inferences.

Course Outcomes

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

CO1 – Describing the basic descriptive statistics.
CO2 - Incorporating the use of hypothesis testing.
CO3 - Develop the concepts of Bayesian Inference and Functions.
CO4 – Understand the concept of Regression and Probability.
CO5- Understand the concept of Frequentist Inferences.

UNIT I PRACTICAL STATISTICS *(12 Hrs)*

Data Structures –Stack , Queue, Graph - Descriptive Statistics – Histogram , Sample mean and Variance , Order Statistics , Sample Co variance – Probability- random Variable , Random Vectors , Random Processes – Machine Learning – Data Preprocessing , Supervised Learning, Unsupervised Learning.

UNIT II THINK STATISTICS *(12 Hrs)*

Statistical Thinking – Process Thinking, Uncertainty – Distributions – Binomial Distribution, Normal Distribution, Poison Distribution – Hypothesis Testing- Data Collection, Null hypothesis, Alternate hypothesis , – Correlation- Pearson, Linear, Sample

UNIT III BAYESIAN METHODS *(12 Hrs)*

Bayesian Inference – Bayesian parametric models, Conjugate prior, Bayesian estimators - Loss Functions – Regression Models, Classification Models.

UNIT IV STATISTICS IN PLAIN ENGLISH *(12 Hrs)*

Regression – Linear Relationship, Independence , Normality - Factor analysis – Dimension Reduction,

Extraction

UNIT V COMPUTER AGE STATISTICAL INFERENCE *(12 Hrs)*

Frequentist Inferences – P-values, Confidence Intervals, Hypothesis Testing - Large Scale Hypothesis – Probability Values and Statistical Significance- Deep Learning - decision trees, sets of rules, instances, graphical models.

Text Books

1. Peter Bruce and Andrew Bruce " Practical Statistics for Data Scientists", O'Reilly Publications

2. Allen B.Downey ," Think Stats" O'Reilly Publications

3. Cameron Davidson , Pilon , " Bayesian Methods for Hackers " .

Reference Books

1. Timothy C.Urdan , " Statistics in Plain English"

2. Bradley Efron and Trevor Hastie, " Computer age Statistical Infrence".

Web References

1. https://www.analyticsvidhya.com/blog/2021/03/statistics-for-data-science/
2. https://towardsdatascience.com/5-free-books-to-learn-statistics-for-data-science-768d27b8215
3. https://towardsdatascience.com/5-free-books-to-learn-statistics-for-data-science-768d27b8215
4. https://www.mastersindatascience.org/learning/statistics-data-science/
5. https://www.edureka.co/blog/math-and-statistics-for-data-science/

	PUBLIC ADMINISTRATION	L	T	P	C	Hrs
A20AET202	(Common to B.A., B.Sc., B.Com.B.B.A. and B.C.A.)	**2**	**0**	**0**	**2**	**30**

(Compulsory Course designed as per the directions issued by Government of India, MHRD, Department of Higher Education (Central University Bureau) F.No.19-6.2014-Desk U Dated 19-05-2014)

Course Objectives

- To introduce the elements of public administration
- To help the students obtain a suitable conceptual perspective of public administration
- To introduce them the growth of institution devices to meet the need of changing times
- To instill and emphasize the need of ethical seriousness in contemporary Indian Public Administration

Course Outcomes

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

CO1 – Understand the concepts and evolution of Public Administration.
CO2 – Be aware of what is happening in the Public Administration in the country.
CO3 – Explain the Territory Administration in the State and the Centre.
CO4 – Appreciate emerging issues in Indian Public Administration.

UNIT I INTRODUCTION TO PUBLIC ADMINISTRATION *(7 Hrs)*

Meaning, nature and Scope of Public Administration and its relationship with other disciplines- Evolution of Public Administration as a discipline – Woodrow Wilson, Henry Fayol , Max Weber and others - Evolution of Public Administration in India – Arthashastra – Colonial Administration upto 1947

UNIT II PUBLIC ADMINISTRATION IN INDIA *(8 Hrs)*

Enactment of Indian Constitution - Union Government – The Cabinet – Central Secretariat -– All India Services – Training of Civil Servants – UPSC – Niti Ayog – Statutory Bodies: The Central Vigilance Commission – CBI - National Human Rights Commission – National Women's Commission – CAG.

UNIT III STATE AND UNION TERRITORY ADMINISTRATION *(8 Hrs)*

Differential Administrative systems in Union Territories compared to States Organization of Secretariat: -Position of Chief Secretary, Functions and Structure of Departments, Directorates – Ministry of Home Affairs supervision of Union Territory Administration – Position of Lt. Governor in UT – Government of Union Territories Act 1963 – Changing trend in UT Administration in Puducherry and Andaman and Nicobar Island

UNIT IV EMERGING ISSUES IN INDIAN PUBLIC ADMINISTRATION *(7 Hrs)*

Changing Role of District Collector – Civil Servants – Politicians relationship – Citizens Charter - Public Grievance Redressal mechanisms –– The RTI Act 2005 – Social Auditing and Decentralization – Public Private partnership.

Text Books

1. Avasthi and Maheswari, "Public Administration in India" Lakshmi Narain Agarwal, Agra.
2. Ramesh K.Arora, "Public Administration: Fresh Perspective", Alekh publishers, Jaipur.

Reference Books

1. Appleby P.H, “Policy and Administration”, The University of Alabama Press, 1949.
2. Gerald.E. Caden, “Public Administration”, Pablidas Publishers, California, 1982.
3. R.B. Jain, “Public Administration in India: 21st Century Challenges for Good Governance”, Deep and Deep, 2002.
4. Ramesh K. Arora, “Indian Public Administration”, Wishwa Prakashan, 2010.
5. Rumki Basu, “Public Administration: Concept and Theories”, Sterling, 2013

Web References

1. http://cic.gov.in/
2. http://www.mha.nic.in/
3. http://rti.gov.in/
4. http://www.cvc.nic.in/
5. https://www.india.gov.in/my-government/whos-who/lt-governors-administrators

A20DAL203 **C++ PROGRAMMING LAB**

L	T	P	C	Hrs
0	0	4	2	30

Course Objectives

- To understand the Fundamentals of Computers and introduction to C++ language.
- To study about functions in C++.
- To understand the Class and Objects.
- To understand the constructor and operator overloading
- To study about Inheritance and Files.

Course Outcomes

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

CO1 – Describing the basic introduction about C++ programming.
CO2 – Incorporating the use of functions.
CO3 - Develop the programming structure using class and objects.
CO4 - Design and develop programs using constructor and operator overloading.
CO5- Understand the File management concepts.

List of Exercises

Write C++ Programs for the followings:

1. Implementation of Basic OOPS concepts.
2. Implementation of Student mark List preparation.
3. Implementation of Function Overloading.
4. Implementation of Friend Function.
5. Implementation of Class and Objects.
6. Implementation of Arrays of Objects.
7. Implementation of Constructor and Destructor.
8. Implementation of Operator Overloading.
9. Implementation of Exception Handling.
10. Implementation of Inheritance.
11. Implementation of Pointer.
12. Implementation of File Concepts.

Reference Books

1. Herbert Schildt, “C++ - From the Ground Up”, McGraw Hill Education, 2nd Edition,2010.
2. Stanley B. Lippman, Stanley Lippman, Barbara Moo, “C++ Primer”, Addison-Wesley Professional, 5th Edition2012.

Web Resources

1. https://www.tutorialspoint.com/cplusplus/index.htm
2. http://www.cplusplus.com/doc/tutorial/
3. https://www.w3schools.com/cpp/
4. https://www.javatpoint.com/cpp-tutorial
5. https://www.geeksforgeeks.org/cpp-tutorial/

A20DAL204	BIG DATA ANAYTICS LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To understand the Fundamentals of Big Data.
- To study the basic terminologies of C language and arrays
- To understand the Functions, Structures and Unions.
- To understand the concepts of Pointers.
- To study about File Management Operations in C.

Course Outcomes

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

CO1 – Describing the basic introduction about Big Data.

CO2 - Incorporating the use of sequential, selection and repetition control structures into a program.

CO3 - Develop the concepts of looping and arrays.

CO4 - Design and develop programs using Functions and Pointers.

CO5- Understand the File management Operations and Pre-processor Directives.

List of Exercises

1. Downloading and installing Hadoop; Understanding different Hadoop modes. Start-up scripts, Configuration files.
2. Hadoop Implementation of file management tasks, such as Adding files anddirectories, Retrieving files and Deleting files
3. Implement of Matrix Multiplication with Hadoop Map Reduce
4. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.
5. Implementation of K-means clustering using Map Reduce
6. Installation of Hive along with practice examples.
7. Installation of HBase, Installing thrift along with Practice examples
8. Patrice importing and exporting data from various data bases .

Text Books

1. Bart Baesens, “Analytics in a Big Data World: The Essential Guide to Data Science and its Applications’, John Wiley & Sons, 2014.

2. Tom White “ Hadoop: The Definitive Guide” Third Edit on, O’reily Media, 2012.

3. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.

4. Min Chen. Shiwen Mao, Yin Zhang. Victor CM Leung, Big Data: Related Technologies, Challenges and Future Prospects, Springer, 2014.

Reference Books

1. Boris lublinsky, Kevin t. Smith Alexey Yakubovich, “Professional Hadoop Solutions”. Wiley, ISBN : 9788126551071, 2015.

2. Chris Eaton, Dirk Deroos et al., “Understanding Big Data”, McGraw Hill , 2010.

3. Tom White, “HADOOP” : The definitive Guide”, O Reilly 2012.

4. Srinath Perera, Thilina Gunarathne, "Hadoop MapReduce Cookbook", PACKT publishing, 2013.

Web References

1. https://www.tutorialspoint.com/big_data_analytics/index.htm
2. https://www.tutorialspoint.com/hadoop/hadoop_big_data_overview.htm
3. https://www.javatpoint.com/big-data-characteristics
4. https://www.techtarget.com/searchdatamanagement/The-ultimate-guide-to-big-data-for businesses
5. https://www.guru99.com/bigdata-tutorials.html

A20DAS303	BUSINESS STATISTICS	L	T	P	C	Hrs
		3	*0*	*0*	*2*	*30*

Course Objectives

- To understand the fundamentals of business statistics.
- To be conversant with the computation of measures of descriptive statistics
- To understand the concept of correlation and regression and their application in business.
- To be familiar with the relevance and need of the index number in measuring economic changes.
- To understand the importance and model of time series.

Course Outcomes

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

CO1 – Explain the concept of statistics and methods of data collection.
CO2 – Solve problems related to central tendency and measures of dispersion.
CO3 – Demonstrate the Application of correlation and regression analysis.
CO4 – Apply the index number techniques in business.
CO5 – Conduct Time Series Analysis.

UNIT I INTRODUCTION *(6 Hrs)*

Statistics - Meaning and scope of business statistics - Roles of statistics for Business Decisions - importance – Limitations - Type and collection of data - Classification and Tabulation of Data - Diagrammatic Representation of data – Types of Charts - Graphical representation of data.

UNIT II MEASURES OF CENTRAL TENDENCY *(6 Hrs)*

Frequency distribution - Measures of central Tendency - Measure of Dispersion – Co-efficient of variation – Skewness - Pearson's coefficient of skewness- Bowley's coefficient of skewness.

UNIT III CORRELATION AND REGRESSION ANAYSIS *(6 Hrs)*

Karl Pearson's co-efficient of correlation, spearman's rank correlation coefficient, Regression analysis: simple regression equations.

UNIT IV INDEX NUMBERS *(6 Hrs)*

Index number – problems in the construction of index numbers – methods of constructing index numbers – simple and weighted index numbers – Laspeyre's , Paasche's , Bowley's and Fisher's Index Number.

UNIT V TIME SERIES ANALYSIS *(6 Hrs)*

Time Series – Importance – Components: Secular Trends, Seasonal Variations, Cyclical Fluctuations, Irregular Variations – Models of Time Series: Free-hand, Semi-Average, Moving Average, and Fitting Mathematical Curve methods.

Text Books

1. S.C. Gupta, "Fundamentals of Statistics", Himalaya Publishing House, 7th Edition, 2018.
2. S.P. Gupta, "Business Statistics", Sultan Chand & Sons, 11th Edition, 2019.
3. R.S.N. Pillai & Bhagawathi, "Statistics – Theory & Practice", S. Chand Publishing, 8th Edition, 2018.

Reference Books

1. Richard Levin, David S. Rubin, “Statistics for Management”, Pearson Education, 8th Edition, 2017.
2. Gupta. S. P., “Statistical Methods”, Sultan Chand & Sons, 46th Edition, 2021.
3. Srivatsava. T.N. and Shailaja Rego, “Statistics for Management”, Tata Mc Graw Hill, 3rd Edition, 2008.
4. Gupta. S. P., Gupta. P.K and Manmohan, “Business Statistics and Operations Research”, Sultan Chand & Sons, 5th Edition, 2011.
5. Hooda, R. P., “Statistics for Business and Economics”, Vikas Publishing House, 5th Edition, 2013.

Web References

1. https://www.icai.org/post/sm-foundation-p3-may2021onwards
2. https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Foundation-Paper4-Revised.pdf
3. https://statlearning.class.stanford.edu
4. www.mit.edu
5. https://www.tutorialspoint.com/statistics/index.htm

		L	T	P	C	Hrs
A20EAL201	**NATIONAL SERVICE SCHEME**					
	(Common to all B.A., B.Sc., B.Com., B.B.A., B.C.A.)	**0**	**0**	**2**	**1**	**30**

Course Objectives

- To introduce about various activities carried out by national service scheme.
- To gain life skills through community service.
- To gain awareness about various service activities performed in higher educational institutions.
- To give exposure about the use of technology to uplift the living standards of rural community.
- To induce the feeling of oneness through harmony of self and society.

Course Outcomes

After the end of the course, the students will able to

CO1 – Recognize the importance of national service in community development.

CO2 – Convert existing skills into socially relevant life skills.

CO3 – Differentiate various schemes provided by the government for the social development.

CO4 – Identify the relevant technology to solve the problems of rural community.

CO5 – Associate the importance harmony of nation with long term development.

UNIT I INTRODUCTION TO NATIONAL SERVICE SCHEME (6 Hrs)

History and objectives, NSS symbol, Regular activities, Special camping activities, Village adaptation programme, Days of National and International Importance, Hierarchy of NSS unit in college. Social survey method and Data Analysis. NSS awards and recognition. Importance of Awareness about Environment, Health, Safety, Gender issues, Government schemes for social development and inclusion policy etc.,

UNIT II LIFE SKILLS AND SERVICE LEARNING OF VOLUNTEER (6 Hrs)

Communication and rapport building, problem solving, critical thinking, effective communication skills, decisionmaking, creative thinking, interpersonal relationship skills, self- awareness building skills, empathy, coping with stress and coping with emotions. Understanding the concept and application of core skills in social work practice, Team work, Leadership, Event organizing, resource planning and management, time management, gender equality, understanding rural community and channelizing the power of youth.

UNIT III EXTENSION ACTIVITIES FOR HIGHER EDUCATIONAL INSTITUTIONS (6 Hrs)

Objective and functions of Red Ribbon Club, Swatchh Bharath Abhiyan, Unnat Bharat Abhiyan, Jal Shakthi Abhiyan, Road Safety Club, Environmental club and Electoral literacy club.

UNIT IV USE OF TECHNOLOGY IN SOLVING ISSUES OF RURAL INDIA (6 Hrs)

Understanding community issues, economic development through technological development. Selection of appropriate technology, Understanding issues in agriculture, fishing, artisans, domestic animals, health and environment.

UNIT V NATIONAL INTEGRATION AND COMMUNAL HARMONY (6 Hrs)

The role of Youth organizations in national integration, NGOs, Diversity of Indian Nation, Importance of National integration communal harmony for the development of nation, Indian Constitution, Building Ethical human Relationships, Universal Human Values, Harmony of self and Harmony of nation.

Reference Books

1. Joseph, Siby K and Mahodaya Bharat (Ed.), " Essays on Conflict Resolution", Institute of GandhianStudies, Wardha,2007.
2. Barman Prateeti and Goswami Triveni (Ed.), " Document on Peace Education", Akansha PublishingHouse, New Delhi, 2009
3. Sharma Anand and G. Davi," Gandhian Way, Academic Foundation", New Delhi Myers SocialPsychology. New Delhi: Tata Mc.Graw Hill, 2007.
4. Taylor E. Shelly et.al , "Social Psychology ",12th Edition New Delhi, Pearson Prentice Hall Singh, 2006.
5. Madhu, "Understanding Life Skills, background paper prepared for education for all: The leap to equality, Government of India report", New Delhi, 2003.
6. Sandhan " Life Skills Education, Training Module, Society for education and development",2005.
7. Jaipur. Radakrishnan Nair and Sunitha Rajan , "Life Skill Education: Evidences form the field", RGNIYD publication, Sriperumbudur,2012.
8. National Service Scheme Manual (Revised), Government of India, Ministry of Youth Affairs and Sports, New Delhi.
9. M. B. Dishad, "National Service Scheme in India: A Case study of Karnataka , Trust Publications, 2001.

Web References

1. http://www.thebetterindia.com/140/national-service-scheme-nss/
2. http://en.wikipedia.org/wiki/national-service-scheme 19=http://nss.nic.in/adminstruct
3. http://nss.nic.in/propexpan
4. http://nss.nic. in
5. http://socialworknss.org/about.html