



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107



SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

B.Sc. Data Science and Analytics

Minutes of 1st meeting of Board of Studies

Venue

Department of Computational Studies
First Floor, SAS Block

Date & Time

12-08-2022 & 10.00 am to 1.00 pm

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2. E. 20. 1



SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

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Madagadipet, Puducherry - 605 107



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

The First meeting of Board of Studies for the course B.Sc. Data Science and Analytics was held through online on 12.08.2022 at 10:00 am 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 First Meeting of Board of Studies.

S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS
1	Mr. S.VISU, MCA., M.Phil., Assistant Professor and Head, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: visucs@smvec.ac.in, Mobile: 9791966297	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, Ph.D., 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	<p>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</p>	Co-opted Expert Member
7	<p>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</p>	Co-opted Expert Member
Internal Members		
8	<p>Dr. A. ANTHONY PAUL RAJ M.Sc., B.Ed., M.Phil., Ph.D. Assistant Professor, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: anthony paulrajsas@smvec.ac.in Mobile: 9942531512.</p>	Internal Member
9	<p>Mrs. S. DIVYA, 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: divyaacs.sas@smvec.ac.in Mobile: 9791456258</p>	Internal Member
10	<p>Mr. N. VELAN, 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: velancs.sas@smvec.ac.in Mobile: 8344577751</p>	Internal Member
11	<p>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</p>	Internal Member

12	Dr. R. RAJENDIRAN M.A., M.Phil., Ph.D., Assistant Professor & Head, Department of Tamil, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: rajendiranr.tamil@smvec.ac.in Mobile: 8608003285.	Internal Member
13	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
14	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: krishnamat14@gmail.com Mobile: 9750028056.	Internal Member

Agenda of the Meeting

BoS/U.G/ B.Sc. Data Science and Analytics/1.1	Welcome Note, Introduction about the Institution, Department and BoS Members
BoS/U.G/ B.Sc. Data Science and Analytics/1.2	To discuss and approve the Curriculum Framework (I-VI Semester) of the B.Sc. Data Science and Analytics Programme from the AY 2022-23
BoS/U.G/ B.Sc. Data Science and Analytics/1.3	To discuss and approve the B.Sc. Data Science and Analytics degree syllabi for I and II semesters under Autonomous Regulations 2020 for the Programme B.Sc. Data Science and Analytics. <ul style="list-style-type: none"> • Course Structure • Discipline Specific Core, Open Electives, Ability Enhancement • and Skill Enhancement Courses • Institutional Training
BoS/U.G/ B.Sc. Data Science and Analytics/1.4	To discuss and approve the Evaluation Systems <ul style="list-style-type: none"> ❖ Marks distribution for Continuous Assessment and End semester Examinations ❖ Question paper pattern ❖ Pass Requirements ❖ Letter Grade System ❖ Classification of Degree
BoS/U.G/ B.Sc. Data Science and Analytics/1.5	To consider any other item with the permission of the Chair

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Minutes of the Meeting

Item No.: BoS/U.G/ B.Sc. Data Science and Analytics/1.1

Mr. S.VISU, Chairman, welcomed all the external and internal members. The meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item No.: BoS/U.G/ B.Sc. Data Science and Analytics/1.2

Chairman, BoS, appraised the minutes of first meeting of BoS and its implementation and then it was confirmed with the approval of BoS Boardise.

Item No.: BoS/U.G/ B.Sc. Data Science and Analytics/1.3

The Curriculum was discussed and recommended to Academic Council with the following improvisations.

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	I	Microsoft Excel Analytics – A20DAC101	Title of the Course	• The Expert Members have suggested to change the course title from Microsoft Excel Analytics into Microsoft Excel .
2	R 2020	II	Data Analysis using Spark Tool – A20DAC202	Title of the Course	• The Board Members have suggested to change the course title from Data Analysis using Spark Tool into Data Analytics .
3	R 2020	III	Social Network Analysis – A20DAC303	Title of the Course	• The Expert Members have suggested to change the course title from Social Network Analysis into AWS Cloud .
5	R 2020	III	Python for Data Science - A20DAT306	Title of the Course	• The Expert Members have suggested to change the course title from Python for Data Science into Introduction to Data science
4	R 2020	IV	SAS Tool – A20DAC404	Title of the Course	• The Board Members have suggested to change the course title from SAS Tool into Block chain .


The above corrections have been made in the curriculum and the details are given in Annexure- I

Item No.: BOS/2021/SAS/UG/CP/4.5



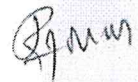
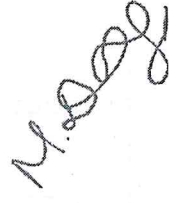


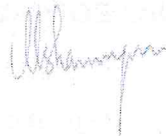
Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III,IV,V & VI			The Board members have appreciated for the segregation of Discipline Specific Elective Papers.

The above particular details are given in Annexure- II

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2.5.20.5

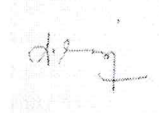


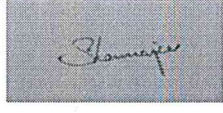
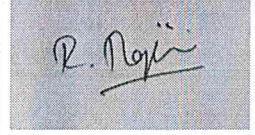
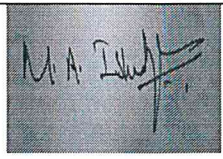
S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	Mr. S.VISU, MCA., M.Phil., Assistant Professor and Head, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: visucs@smvec.ac.in, Mobile: 9791966297	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	University Nominee	
3	Dr. R. AROKIA PAUL RAJAN MCA, PGDBA, MA, Ph.D., Associate Professor, Computer Science, School of Sciences, Bangalore Central Campus, Christ University, Bangalore, Karnataka. Mail id: paulrajan@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 Aretificial 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	

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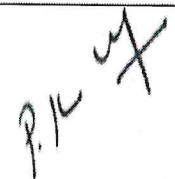


2.E.20'6

Internal Members

8	Dr. A. ANTHONY PAUL RAJ M.Sc., B.Ed., M.Phil., Ph.D. Assistant Professor, Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry. 605 107. E-mail: anthony paulrajsas@smvec.ac.in, Mobile: 9942531512.	Internal Member	
9	Mrs. S. DIVYA, 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: divyacs.sas@smvec.ac.in Mobile: 9791456258	Internal Member	
10	Mr. N. VELAN, 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: velancs.sas@smvec.ac.in Mobile: 8344577751	Internal Member	
11	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	
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14	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: krishnamat14@gmail.com Mobile: 9750028056.	Internal Member	
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The meeting was concluded at 1:00 pm with vote of thanks by **Mr. S. Visu**, Head of the Department, Department of Computational Studies.



Mr. S. VISU,
HOD / Dept. of Computational Studies,
Chairman-BoS (B.Sc.CS)



Dean SAS
[Dr. S. Muthulakshmi]





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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 - I

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2. E. 20. 9

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

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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

2.E.20.12



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SCHOOL OF ARTS AND SCIENCES

Department of Computational Studies
B.Sc. Data Science and Analytics

Minutes of 1st meeting of Board of Studies

ANNEXURE - II

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2.E.20.13

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

2.E. 20.14



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SCHOOL OF ARTS AND SCIENCE

BACHELOR OF SCIENCE IN DATA SCIENCE AND ANALYTICS

ACADEMIC REGULATIONS 2020(R-2020) CURRICULUM AND SYLLABI



2.E.20.15

COLLEGE VISION AND MISSION

Vision

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

Mission

M1: Quality Education:

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

M2: Research and Innovation:

To foster value based research and innovation in collaboration with industries and institutions globally for creating 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 the growth 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 the sustainable 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 Computer Science.

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.

BACHELOR OF SCIENCE IN DATA SCIENCE AND ANALYTICS

2.E.20.16

STRUCTURE FOR UNDERGRADUATE PROGRAMME

Sl. No	Course Category	Breakdown of Credits
1	Language	6
2	English	6
3	Discipline Specific Core Courses (DSC)	81
4	Discipline Specific Elective Courses (DSE)	12
5	Inter- Disciplinary Core courses (IDC)	16
6	Skill Enhancement Courses (SEC)	12
7	Employability Enhancement Courses (EEC*)	0
8	Ability Enhancement Compulsory Courses (AECC)	4
9	Open Elective (OE)	4
10	Extension Activity (EA)	1
Total		142

Sl.No	Course Category	Credits per Semester						Total Credits
		I	II	III	IV	V	VI	
1	Language Modern Indian Language (MIL)	3	3	-	-	-	-	6
2	English (ENG)	3	3	-	-	-	-	6
3	Discipline Specific Core Courses (DSC)	12	12	12	12	16	17	81
4	Discipline Specific Elective Courses (DSE)	-	-	3	3	3	3	12
5	Inter-Disciplinary courses (IDC)	4	4	4	4	-	-	16
6	Skill Enhancement Courses (SEC)	2	2	2	2	2	2	12
7	Employability Enhancement Courses (EEC*)	-	-	-	-	-	-	-
8	Ability Enhancement Compulsory Courses (AECC)	2	2	-	-	-	-	4
9	Open Elective (OE)	-	-	2	2	-	-	4
10	Extension Activity (EA)	-	1	-	-	-	-	1
Total		26	27	23	23	21	22	142

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

* EEC will not be included for the computation of "Total of credits" as well as "CGPA" calculation

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	A20DAT305	Introduction to Data Science	DSC	4	0	0	4	25	75	100
3	A20DAE306	Discipline Specific Elective-I	DSE	3	0	0	3	25	75	100
4	A20DAD30X	Linear Algebra	IDC	3	1	0	4	25	75	100
5	A20XXO303	Open Elective	OE	2	0	0	2	25	75	100
Practical										
6	A20DAL305	RDBMS Lab	DSC	0	0	4	2	50	50	100
7	A20DAL305	Python for Data Science Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20DAS306	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 Database	DSC	4	0	0	4	25	75	100
2	A20DAT407	Introduction to Artificial Intelligence	DSC	4	0	0	4	25	75	100
3	A20DAE408	Discipline Specific Elective-II	DSE	4	0	0	3	25	75	100
4	A20DAD4XX	Health Analytics	IDC	3	0	0	4	25	75	100
5	A20XXO404	Open Elective	OE	2	0	0	2	25	75	100
Practical										
6	A20DAL407	NoSQL Database - Lab	DSC	0	0	4	2	50	50	100
7	A20DAL407	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



2.E.20.19

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	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, Algorithms For Big Data	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	Major Project	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

Annexure – I
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



Annexure – II
OPEN ELECTIVE COURSES
COMPLETE LIST OF OPEN ELECTIVES OFFERED BY ALL THE DEPARTMENTS

Sl. No	Course Code	Course Title	Offering Department
1	A20BTO301	Biotechnology for Human Welfare	Bioscience
2	A20BTO302	Food Processing	Bioscience
3	A20BTO303	Food Technology	Bioscience
4	A20CHO304	Food Analysis (Practical)	Chemistry
5	A20CHO305	Molecules of Life (Practical)	Chemistry
6	A20CHO306	Water Analysis (Practical)	Chemistry
7	A20CMO307	Fundamentals of Accounting and Finance	Commerce and Management
8	A20CMO308	Fundamentals of Management	Commerce and Management
9	A20CMO309	Fundamentals of Marketing	Commerce and Management
10	A20CPO310	Data Structures	Computational Studies
11	A20CPO311	Programming in C	Computational Studies
12	A20CPO312	Programming in Python	Computational Studies
13	A20ENO313	Conversational Skills	English
14	A20ENO314	Fine-tune your English	English
15	A20ENO315	Interpersonal Skills	English
16	A20MAO316	Mathematical Modelling	Mathematics
17	A20MAO317	Quantitative Aptitude - I	Mathematics
18	A20MAO318	Statistical Methods	Mathematics
19	A20VCO319	Event Management	Media Studies
20	A20VCO320	Graphic Design	Media Studies
21	A20VCO321	Role of social media	Media Studies
22	A20NDO322	Basic Food Groups	Food Science
23	A20NDO323	Life Style Management	Food Science
24	A20NDO324	Nutritive Value of Foods	Food Science
25	A20PHO325	Astrophysics	Physics
26	A20PHO326	Basic of Modern Communication System	Physics
27	A20PHO327	Bio-Physics	Physics
28	A20TMO328	அடிப்படைத்தமிழ்	Tamil
29	A20TMO329	வாழ்வியல் இலக்கணம்	Tamil
30	A20TMO330	புதுக்கவிதைப் பாடறை	Tamil

Sl. No.	Course Code	Course Title	Offering Department
1	A20BTO401	Herbal Technology	Bioscience
2	A20BTO402	Vermiculture	Bioscience
3	A20BTO403	Biotechnology for Society	Bioscience
4	A20CHO404	C++ Programming and its Application to Chemistry	Chemistry
5	A20CHO405	Computational Chemistry Practical	Chemistry
6	A20CHO406	Instrumental Methods of Analysis	Chemistry
7	A20CMO407	Essential Legal Awareness	Commerce and Management
8	A20CMO408	Essentials of Insurance	Commerce and Management
9	A20CMO409	Practical Banking	Commerce and Management
10	A20CPO410	Database Management Systems	Computational Studies
11	A20CPO411	Introduction to Data Science using Python	Computational Studies
12	A20CPO412	Web Development	Computational Studies
13	A20ENO413	English for Competitive Exam	English
14	A20ENO414	English Next-India	English
15	A20ENO415	Functional English	English
16	A20MAO416	Discrete mathematics	Mathematics
17	A20MAO417	Operations Research	Mathematics
18	A20MAO418	Quantitative Aptitude - II	Mathematics
19	A20VCO419	Basics of News Reporting	Media Studies
20	A20VCO420	Scripting for media	Media Studies
21	A20VCO421	Video Editing	Media Studies
22	A20NDO422	Food Labelling	Food Science
23	A20NDO423	Hygiene and Sanitation	Food Science
24	A20NDO424	Nutrition for Adolescent	Food Science
25	A20PHO425	Digital Electronics	Physics
26	A20PHO426	Geo-Physics	Physics
27	A20PHO427	Space Science	Physics
28	A20TMO428	சிறுகதைப் பயிற்சி	Tamil
29	A20TMO429	செய்தி வாசிப்பு பயிற்சி	Tamil
30	A20TMO430	நிகழ்த்துக்கலை	Tamil

மொழித்தாள்
தமிழ் - I

(B.A., B.Sc., B.Com., B.B.A. & B.C.A., பாடப்பிரிவுகளுக்கும்மான வொதுத்தாள்)

L T P C Hrs
3 0 0 3 45

A20TAT101

பாடத்திட்டத்தின் நோக்கம்

- இரண்டாயிரம் ஆண்டுகால தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.
- தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள், அடையாளங்கள் ஆகியவற்றை காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழியாகக் கூறுவதற்கு இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.
- மொழியின் கட்டமைப்பைப் புரிந்துகொள்வதற்கு ஏதுவாக பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.
- வாழ்வியல் சிந்தனைகள், ஒழுக்கவியல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது.
- சிந்தனை ஆற்றலைப் பெருக்குவதற்குத் தாய்மொழியின் பங்களிப்பினை உணர்த்த இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.

பாடத்திட்டத்தின் வெளிப்பாடுகள்

- CO1- இலக்கியங்கள் காட்டும் வாழ்வியல் நெறிமுறைகளைப் பேணிநடத்தல்.
CO2 - நமது எண்ணத்தை வெளிப்படுத்தும் கருவியாகத் தாய்மொழியைப் பயன்படுத்துதல்.
CO3 - தகவல் தொழில்நுட்பத் தாய்மொழியின் முக்கியத்துவத்தை உணர்தல்.
CO4 - தாய்மொழியின் சிறப்பை அறிதல்.
CO5 - இலக்கிய இன்பங்களை நுகரும் திறன்களை வளர்த்தல்.

அலகு-1

(9 Hrs)

இக்காலக் கவிதைகள்-1

- | | | |
|--------------------|---|----------------------------------|
| 1. பாரதியார் | - | கண்ணன் என் சேவகன் |
| 2. பாரதிதாசன் | - | தமிழ்ப்பேறு |
| 3. அத்துல் ரகுமான் | - | அவதாரம் |
| 4. மீரா | - | கனவுகள் + கற்பனைகள் = காகிதங்கள் |
| 5. து.நரசிம்மன் | - | மன்னித்துவிடு மகனே |

அலகு-2

(9 Hrs)

இக்காலக் கவிதைகள்-2

- | | | |
|----------------------|---|--------------------------------|
| 1.ராஜா சந்திரசேகர் | - | கைவிடப்பட்ட குழந்தை |
| 2. அனார் | - | மேலும் சில இரத்தக் குறிப்புகள் |
| 3. சுகிர்தராணி | - | அம்மா |
| 4. நா.முத்துக்குமார் | - | தூர் |

அலகு-3

(9 Hrs)

சிற்றிலக்கியங்கள்

- | | | |
|-------------------------|---|---------------------------------------|
| 1. கலிங்கத்துப் பரணி | - | வொருதடக்கை வாள் எங்கே... (பாடல்-485) |
| 2. அழகர்சின்னைவிடு தூது | - | இதமாய் மனிதருடனே... (பாடல்-45) |
| 3. நந்திக் கலம்பகம் | - | அம்பொன்று வில்லொடிதெல்... (பாடல்-77) |
| 4. முக்சுபு பள்ளூ | - | பாயும் மருதஞ் செழிக்கவே... (பாடல்-47) |
| 5. குற்றாலக் குறவஞ்சி | - | ஓடக் காண்பதுமே... (பாடல்-9) |

காப்பியங்கள்

மணிமேகலை-உலகறவி புக்க காதை- 'மாசுஇல் வால்ஒளி! - இந்நாள் போலும் இளங்கொடி கெடுத்தனை'. (28-அடிகள்)

அலகு-4

(9 Hrs)

தமிழ் இலக்கிய வரலாறு

1. சிற்றிலக்கியம்- தோற்றமும் வளர்ச்சியும்
2. புதுக்கவிதை- தோற்றமும் வளர்ச்சியும்
3. சிறுகதை -தோற்றமும் வளர்ச்சியும்
4. புதினம் -தோற்றமும் வளர்ச்சியும்

BACHELOR OF SCIENCE IN DATA SCIENCE AND ANALYTICS

2.E.20.24

Academic Curriculum and Syllabi R-2020

5. உரைநடை - தோற்றமும் வளர்ச்சியும்

(9 Hrs)

அககு 5

வொழிய்பயிற்சி

1. கலைச்சொல்லாக்கம்
2. அகரவரிசைப்படுத்துதல்
3. மரபுத்தொடர்/பழமொழி
4. கலை விமர்சனம்
5. நேர்காணல்

உரைநடைப் பகுதி

1. உ.வே.சாமிநாதையர் - சிவதருமோத்திரச் சுவடி பெற்ற வரலாறு.
2. தஞ்சாவூர் - சுவாமிநாதையர் கோபம்.
3. இரா. பச்சியம்பன் - மாடல்ல மற்றையவை.

பார்வை நூல்கள்

1. கைலாசபதி, க., தமிழ் நாவல் இலக்கியம், குமரன் பதிப்பகம், வடபழனி, 1968.
2. சுந்தரராஜன், பே.கோ. சிவபாதசுந்தரம். சோ., தமிழில் சிறுகதை வரலாறும் வளர்ச்சியும், க்ரியா, சென்னை, 1989.
3. பரந்தாமனார், அ.கி., நல்ல தமிழ் எழுத வேண்டுமா, பாரி நிலையம், சென்னை, 1998.
4. பாக்கியமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.எச். பதிப்பகம், சென்னை, 2011.
5. வல்லிக்கண்ணன், புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும், அன்னம், சிவகங்கை, 1992.

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1. சக்திவேல், சு., தமிழ் மொழி வரலாறு, மாணிக்கவாசகர் பதிப்பகம், சிதம்பரம், 1988.
2. சிற்பி பாலசுப்ரமணியம் மற்றும் நீலபத்மநாபன், புதிய தமிழ் இலக்கிய வரலாறு, தொகுதி-1, 2, 3, சாகித்திய அகாதி, புதுவடல், 2013.
3. பாரதியார், பாரதியார் கவிதைகள், குமரன் பதிப்பகம், சென்னை, 2011.

இணையத்தளங்கள் :

- <http://www.tamilkodal.com>
<http://www.languageelab.com>
<http://www.tamilweb.com>

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

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, monsieur, le BHV s'il vous plait ?

UNITÉ - 4

Au marche

On déjeune ici ?

UNITÉ - 5

On va chez ma copine ?

Chez Susana

Text Book

Prescribed Textbook : *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.

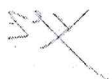
3. Gale, Emily Dickinson's Because I could not stop for Death, Cengage Learning, 2015

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.

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, 2nd 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-/>

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

Course Objectives:

- Impart the basic concepts of structures, pointers and data structures.
- Understand concepts linked lists and their applications.
- Understand basic concepts about stacks, queues and their applications.
- Understand basic concepts of trees, graphs and their applications.
- Enable them to write algorithms for sorting and searching.

Course Outcomes:

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

- CO1** – Use arrays, pointers and structures to formulate algorithms and programs.
CO2 – Design and implement applications of Linked List.
CO3 – Design and implement Stack ADT using Array and Linked List.
CO4 – Design and implement Queue ADT using Array and Linked List.
CO5 – Solve problems involving graphs and trees.
CO6 – Analyze searching and sorting techniques based on time and space complexity.

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

Introduction to Structures - Basic Terminology - Data Structure Classification - Operations on data structure - Arrays: Sparse Matrices – Representation of Arrays - Introduction of Algorithms - Algorithm Analysis - Algorithm Complexity - Stacks and Queues.

UNIT II LINKED LIST**(10 Hrs)**

Introduction to Linked List: Singly Linked Lists - Doubly Linked List and Dynamic - Circular Linked List – Operations of linked lists - Applications of linked lists.

UNIT III STACKS**(12 Hrs)**

Stacks- Standard stacks operations - Applications of Stack - Array implementation of Stack in C- Conversion of infix to postfix - Conversion of Infix to Prefix - Conversion of Prefix to Postfix Expression.

UNIT IV QUEUES**(10 Hrs)**

Queues - Queue ADT - Static and dynamic Representation - operations - Linear queue - Circular Queue - Circular Queue operations - Dequeue (Double ended queue) ADT - Applications of queues.

UNIT V SEARCHING, SORTING AND NON-LINEAR DATA STRUCTURES**(16 Hrs)**

Searching- Linear Search, Binary Search, Sorting- Selection sort, Bubble sort, Insertion sort, Quick sort, Merge sort, Shell sort - Non-Linear Data Structures- Trees – Introduction, Definition, Terminology, Applications, Tree Representations. Graphs - Introduction, Definition, Terminology, Applications, Graph Representations- Adjacency matrix, Adjacency lists.

Text Books

1. E. Balagurusamy, "Programming in ANSI C", McGraw Hill Education, 6th Edition, 2012.
2. "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.
3. Data Structures using C, R.Thareja 2nd Edition, Oxford Press.
4. Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.
5. Data structures and Program Design in C, 2nd edition, R.Kruse, C.L.Tondo and B.Leung, Pearson.

Reference Books

1. Data structures using C, A.K.Sharma, 2nd edition, Pearson.
2. "How to Solve it by Computer", 2nd Impression by R. G. Dromey, Pearson Education
3. A Puntambekar, "Data Structures", Third Revised Edition, Technical Publications Pune, 2008.

Web References

1. <https://hackr.io/tutorials/learn-data-structures-algorithms>
2. <https://www.geeksforgeeks.org/fundamentals-of-algorithms/>
3. <https://www.udemy.com/introduction-to-algorithms-and-data-structures-in-c/>
4. <https://leetcode.com>

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A20DAD101	APPLIED PROBABILITY AND STATISTICS	L 4	T 0	P 0	C 4	Hrs 60
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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-Solve the problems under Random variables.
 CO2-Apply the various distributions in real life problems
 CO3-Find the correlation between the variables and find the regression lines.
 CO4-Solve the various real life problems using large sampling.
 CO5-Apply the various test under small sampling.

UNIT-I RANDOM VARIABLES (12Hrs)

Random Variables: Discrete - continuous random variables - probability mass - probability density and cumulative distribution functions - Mathematical expectation - Variance-Problems.

UNIT-II PROBABILITY DISTRIBUTIONS(DISCRETE AND CONTINUOUS) (12Hrs)

Binomial, Poisson, Normal, exponential and Gamma distributions -their Properties.-Problems(Excluded Derivatives of Mean,Variance,MGF for all distributions)

UNIT-III CORRELATION & REGRESSION (12Hrs)

Coefficient of correlation- the rank correlation.-Regression Coefficient-The lines of regression.

UNIT-IV LARGE SAMPLES (12Hrs)

Testing of hypothesis: Null hypothesis, Alternate hypothesis, Type I & Type II errors- Level of significance. 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 SMALL SAMPLES. (12Hrs)

Student t-distribution, Test of significance sample mean and population mean, difference between means of two small samples. Snedecor's F- distribution . Test of equality of two population variances. Chi-square distribution, Chi-square test of goodness of fit-Problems only(Excluded Derivations of all tests)

TextBooks

- 1.T.Veerarajan,—Probability,statistics and Random Processes, ITataMc.Graw-Hill Publishing Company Ltd.,3rdEdition,2008.
- 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.

ReferenceBooks

- 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/>

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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 and appreciate 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) and local 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. Bharucha Erach, "Textbook of Environmental Studies for Undergraduate Courses", Telangana, India: Orient Black Swan, 2nd Edition, 2013.
2. Basu Mahua, 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 Keep Avoiding (Like C)", Addison Wesley, 2016.
2. Anita Goel and Ajay Mittal, "Computer Fundamentals and programming in C", 1st Edition, Pearson Education , 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 – Solve 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. Necaie, "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, Sartaj Sahni, "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/>

A20DAS101

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

L	T	P	C	Hrs
0	0	4	2	30

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: Trinity Press 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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மொழித்தாள்
தமிழ் - II

(B.A., B.Sc., B.Com., B.B.A., & B.C.A. பாடப்பிரிவுகளுக்கான வாயுத்தாள்)

A20TAT202

L T P C Hrs
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பாடத்திட்டத்தின் நோக்கம்

- இரண்டாயிரம் ஆண்டுகால தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.
- தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள், அடையாளங்கள் ஆகியவற்றை காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழியாகக் கூறுவதற்கு இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.
- மொழியின் கட்டமைப்பைப் புரிந்துகொள்வதற்கு ஏதுவாக பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.
- வாழ்வியல் சிந்தனைகள், ஒழுக்கவியல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது.
- சிந்தனை ஆற்றலைப் பெருக்குவதற்குத் தாய்மொழியின் பங்களிப்பினை உணர்த்த இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.

பாடத்திட்டத்தின் வெளிப்பாடுகள்

- CO1 – இலக்கியங்கள் காட்டும் வாழ்வியல் நெறிமுறைகளைப் பேணிநடத்தல்.
CO2 – நமது எண்ணத்தை வெளிப்படுத்தும் கருவியாகத் தாய்மொழியைப் பயன்படுத்துதல்.
CO3 – தகவல் தொடர்புக்குத் தாய்மொழியின் முக்கியத்துவத்தை உணர்தல்.
CO4 – தாய்மொழியின் சிறப்பை அறிதல்.
CO5 – இலக்கிய இன்பங்களை நுகரும் திறன்களை வளர்த்தல்.

அலகு-1

(9 Hrs)

1. எட்டுத்தொகை: 1. குறுந்தொகை (படல்-130) 2. நற்றிணை (பாடல்-27) 3. அகநானூறு (பாடல்-86).
2. பத்துப்பாட்டு: சிறுபாணாற்றுப்படை (அடிகள்-126-143).
3. பதினெண் கீழ்க்கணக்கு: திருக்குறள்- வெகுளாமை (அதிகாரம்-31), காதல் சிறப்புரைத்தல் (அதிகாரம்-113).

அலகு-2

(9 Hrs)

1. எட்டுத்தொகை: 1. ஐங்குறுநூறு (பாடல்-203), 2. கலித்தொகை- பாலைத்திணை (பாடல்-9), 3. புறநானூறு (பாடல்-235).
2. பத்துப்பாட்டு- முல்லைப்பாட்டு (6-21).
3. பதினெண் கீழ்க்கணக்கு :
 1. நாலடியார் - நல்லார் எனத்தான் (221) .
 2. திரிகடுகம்- கோலஞ்சி வாழும் குடியும் (33).
 3. இனியவை நாற்பது- குழவி தளர்நடை (14).
 4. கார் நாற்பது- நலமிகு கார்த்திகை (26).
 5. களவழி நாற்பது- கவளங்கொள் யானை (14).

அலகு-3

(9 Hrs)

சைவம்- பன்னிரு திருமுறைகள்

- | | | |
|---------------------|---|---|
| 1. திருஞானசம்பந்தர் | - | வேயுறு தோளியங்கள் (இரண்டாம் திருமுறை). |
| 2. திருநாவுக்கரசர் | - | மனமெனும் தோணி (நான்காம் திருமுறை). |
| 3. சுந்தரர் | - | ஏழிசையாய் இசைப்பயனாய் (ஏழாம் திருமுறை). |
| 4. மாணிக்கவாசகர் | - | ஆதியும் அந்தமும் இல்லா (திருவெம்பாவை). |
| 5. திருமூலர் | - | அன்பு சிவம் இரண்டு (திருமந்திரம்). |

வைணவம் - நாலாயிரத் திவ்வியப் பிரபந்தம்

- | | | |
|---------------------------|---|--------------------------------|
| 1. பேயாழ்வார் | - | திருக்கண்டேன் வான்மேனி.... |
| 2. பெரியாழ்வார் | - | கருங்கண் தோகை மயிற் பீலி.... |
| 3. தொண்டரூர்ப்பொடிஆழ்வார் | - | பச்சைமாமலை போல்.... |
| 4. ஆண்டார் | - | கருப்பூரம் நாறுமோ? கமலப்பூ.... |
| 5. திருமங்கையாழ்வார் | - | வாடினேன் வாடி வருந்தினேன்.... |

இஸ்ஸாயியம்

சீறாய்ப்புராணம்- பாடல் நின்ற நினை மானுக்குப்...5 பாடல்கள் (பாடல் எண்கள் 61-65).
கிருத்துவம்

இரட்சைய யாதீகம்- கடைதிறப்புப் படலம் -5 பாடல்கள் (பாடல் எண்கள்: 3,9,10,15,16).

அலகு - 4**தமிழ் இலக்கிய வரலாறு**

(9 Hrs)

1. சங்க இலக்கியங்கள் 2. நீதி இலக்கியங்கள் 3. பக்தி இலக்கியங்கள் 4. காப்பியங்கள்.

அலகு-5**சிறுகதைகள்**

(9 Hrs)

1. புதுமைபித்தன்	-	அகலிகை
2. நா. பிச்சமூர்த்தி	-	வேப்பமரம்
3. அகிலன்	-	ஒரு வேளைச்சோறு
4. ஜி.நாகராஜன்	-	பச்சக் குதிரை
5. கி.ராஜநாராயணன்	-	கதவு
6. சா.கந்தசாரி	-	தக்கையின் மீது நான்கு கண்கள்
7. ஆண்டவர் பிரியதர்ஷினி	-	மாத்திரை
8. வண்ணதாசன்	-	ஒரு உல்லாசப் பயணம்
9. சு. தமிழ்ச்செல்வன்	-	வெயிலோடு போய்
10. பாரததேவி	-	மாப்பிள்ளை விருந்து

பார்வை நூல்கள் :

1. அரசு, வீ., இருபதாம் நூற்றாண்டு சிறுகதைகள் நூறு, அடையாளம் பதிப்பகம், திருச்சி, 2013.
2. அருணாச்சலம், பா., பக்தி இலக்கியங்கள், யாரி நிலையம், சென்னை, 2010.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை, 2000.
4. பாக்கியமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.வி.எச். பதிப்பகம், சென்னை, 2011.
5. பசுபதி, மா. வே., செம்மொழித் தமிழ் இலக்கண இலக்கியங்கள், தமிழ்ப் பல்கலைக்கழகம், 2010 .

உரைநடை நூல்கள் :

1. அன்பு, பா., மா.பொ.சி யின் ஒரு இலக்கிய நூல்கள் ஒரு மதிப்பீடு, உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை, 1983.
2. பின்னா, கே.கே., தமிழக வரலாறும் மக்களும் பண்பாடும், உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை, 2000.
3. ஜெயமோகன், நவீன இலக்கிய அறிமுகம், உயிர்மெய் பதிப்பகம், சென்னை, 1995.

இணையத்தளங்கள் :

<http://www.tamilkodal.com>
<http://www.languageelab.com>
<http://www.tamilweb.com>

A20FRT202

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

L	T	P	C	Hrs
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 à Paris
Vous allez Vivre
L'avenir du Français

UNITÉ – 4**(9 Hrs)**

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

UNITÉ – 5**(9 Hrs)**

Retour des Antilles
Au voleur ! Au voleur

TextBooks

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

Reference Book

Festival 1

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A20GET202

GENERAL ENGLISH- II
(Common to B.A, B.Sc. and BCA)

L	T	P	C	Hrs
3	0	0	3	45

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

- | | |
|--|----------------|
| 1. Lord Byron: She Walks in Beauty | (9 Hrs) |
| 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

- | | |
|--------------------------------------|----------------|
| 1. Ernest Hemingway-A Day's Wait | (9 Hrs) |
| 2. Anton Chekhov: The Lottery Ticket | |

UNIT III FICTION

- | | |
|--------------------------------------|----------------|
| 1. Jane Austen - Pride and Prejudice | (9 Hrs) |
|--------------------------------------|----------------|

UNIT IV GRAMMAR

- | | |
|-------------------------------------|----------------|
| 1. Voice - Conditionals - Coherence | (9 Hrs) |
|-------------------------------------|----------------|

UNIT V COMPOSITION

- | | |
|-------------------|----------------|
| 1. Letter Writing | (9 Hrs) |
| 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.

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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 Default 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", 9th Edition, Pearson Education, 2012.
- Stanley B. Lippman, Stanley Lippman, Barbara Moo, "C++ Primer", Addison-Wesley Professional, 5th Edition 2012.

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 Iubinsky, 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>



A20DAD202**STATISTICS FOR DATA SCIENCE**

L	T	P	C	Hrs
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, Poisson 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 Inference".

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/>

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A20AET202	PUBLIC ADMINISTRATION	L	T	P	C	Hrs
	(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>

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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 Edition 2012.

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/>

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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 and directories, 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'reilly 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>

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2.E.20.56

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 ANALYSIS**(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>

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A20EAL201	NATIONAL SERVICE SCHEME (Common to all B.A., B.Sc., B.Com., B.B.A., B.C.A.)	L	T	P	C	Hrs
		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 Gandhian Studies, Wardha, 2007.
2. Barman Prateeti and Goswami Triveni (Ed.), "Document on Peace Education", Akansha Publishing House, New Delhi, 2009
3. Sharma Anand and G. Davi, "Gandhian Way, Academic Foundation", New Delhi Myers Social Psychology. 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>