PRIST
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UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMIL NADU

SCHOOL OF ARTS AND SCIENCE

Department of Mathematics

B.Sc. Mathematics Syllabus

[Regulation 2020]

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School of Arts and Science

Department of Mathematics

B. Sc., Syllabus-Regulation 2020

B.Sc., Graduate Attributes

- Information Literacy
- Problem Analysis
- Design/development of solutions
- Modern tool usage
- Professional and Ethical understanding

B.Sc. - Programme Educational Objectives (PEO)

- PEO1 - To provide students with knowledge, abilities and insight in mathematics and related fields.
- PEO2. -To enables them to work as a mathematical professional, or qualify for training as scientific researcher.
- PEO3 - To develops the ability to utilize the mathematical problem solving methods such as analysis, modeling, programming and mathematical software applications in addressing the real world problems and heuristic issues.
- PEO4 - To enables students to recognize the need for and the ability to engage in life-long learning.
- PE05 - To understand the relationship of Mathematics with other technical fields and develop competence in the application of Mathematics in one or more areas.
- PE06 - To formulate and solve problems from a Mathematical perspective.

B.Sc.- Programme Specific Outcomes (PSO)

- PSO1 - To think in a critical manner.
- PSO2 - To know when there is a need for information, to be able to identify, locate, Evaluate, and effectively use that information for the issue or problem at hand.
- PSO3 - To formulate and develop mathematical arguments in a logical manner.
- PSO4 - To acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
- PSO5. To understand, formulate and use quantitative models arising in social science, Business and other contexts.
- PSO6. Been capable of executing research and research projects

B.Sc. Programme Outcomes (PO)

- PO1 - To understand and apply the knowledge of mathematical science to solve real life problems.
- PO2 - To design the methodology suitable to the problem on hand.
- PO3 - To analyze and interpret solution outputs and generate new ideas based on the Outputs.
- PO4 - To lead, work in team and give priority to the success of the aim of the team.
- PO5 - To recognize and learn the importance of life-long learning.
- PO6 - Ability to pursue advanced studies and research in pure and applied mathematical science.
- PO7 - Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.

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SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MATHEMATICS

B.Sc., MATHEMATICS - REGULATION 2020

COURSE STRUCTURE

SEMESTER – I

Course Code	Course Title	L	T	P	C
	THEORY				
20110AEC11/ 20111AEC11/ 20132AEC11/ 20135AEC11	Tami – I/Advanced English-I/Hindi-I/ French - I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20112AEC13	Differential Calculus and Vector Calculus	5	0	0	3
20112AEC14	Trigonometry, Analytical Geometry 3D and Calculus	5	0	0	3
20120AEC15	Programming in C	6	0	0	5
	PRACTICAL				
20120AEC16L	Programming in C Lab	0	0	3	2
	Total	**24**	**0**	**3**	**17**
	AUDIT COURSE				
201ACLSICN	Indian Constitution	-	-	-	**2**
201ACLSUHV	Universal Human Values	-	-	-	**2**

SEMESTER – II

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC21/ 20111AEC21/ 20132AEC21/ 20135AEC21	Tamil – II/ Advanced English-II/Hindi-II/ French – II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20112AEC23	Integrals & Differential Equations	5	0	0	3
20112SEC24	Sequence and series	5	0	0	4
20120AEC25	Web Programming	5	1	0	5
PRACTICAL					
20120AEC26L	Web Programming Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
20112RLC27	Research Led Seminar	-	-	-	1
	Total	**23**	**1**	**3**	**18**
AUDIT COURSES					
201ACLSCOS	Communication Skills	-	-	-	**2**
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	**2**

SEMESTER – III

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC31/ 20132AEC31/ 20111AEC31/ 20135AEC31	Tamil – III/Hindi-III/Advanced English-III/ French – III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20112AEC33	Number Theory	4	0	0	3
20112AEC34	Numerical Analysis	4	0	0	3
20118AEC35	Mathematical Statistics-I	5	1	0	5
PRACTICAL					
20118AEC36L	Mathematical Statistics-I Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
20112RMC37	Research Methodology	2	0	0	2
	Total	**23**	**1**	**3**	**19**
AUDIT COURSE					
201ACLSOAN	Office Automation	**-**	**-**	**-**	**2**

SEMESTER – IV

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC41/ 20111AEC41/ 20132AEC41/ 20135AEC41	Tamil-IV/Advanced English-IV /Hindi-IV/ French – IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20112SEC43	Operations Research	4	0	0	3
20112AEC44	Astronomy	4	0	0	3
201ENSTU45	Environmental Studies	2	0	0	2
20118AEC46	Mathematical Statistics-II	5	1	0	5
PRACTICAL					
20118AEC47L	Mathematical Statistics- II Lab	0	0	3	2
	Total	**23**	**1**	**3**	**19**
AUDIT COURSE					
201ACLSLMS	Leadership and Management Skills	-	-	-	**2**
201ACSSAQA	General Aptitude and Quantitative Ability				**2**

SEMESTER – V

Course Code	Course Title	L	T	P	C
THEORY					
20112AEC51	Modern Algebra	5	0	0	4
20112AEC52	Real Analysis	5	1	0	4
20112SEC53	Statics	5	1	0	4
20112SEC54	Programming in C++	5	0	0	3
20112DSC55_	Discipline Specific Elective -I	5	0	0	3
RESEARCH SKILL BASED COURSE					
20112BRC56	Participation in Bounded Research	-	-	-	1
	Total	**25**	**2**	**0**	**19**
AUDIT COURSE					
201ACLSPSL	Professional Skills	-	-	-	**2**

SEMESTER – VI

Course Code	Course Title	L	T	P	C
THEORY					
20112AEC61	Complex Analysis	5	0	0	4
20112SEC62	Dynamics	5	1	0	4
20112AEC63	Discrete Mathematics	5	0	0	4
20112DSC64_	Discipline Specific Elective –II	5	0	0	4
201_ _OEC(2 Digit Course Name)	Open Elective	4	0	0	2
PRACTICAL					
20120SEC65L	Project Work	-	-	-	4
20120SEC66L	Program Exit Examination	-	-	-	1
	Total	**24**	**1**	**0**	**23**
AUDIT COURSE					
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	**2**
201ACLSCET	Community Engagement	-	-	-	**1**
Total Credits -Programme					**115**
Total Credits - Audit Courses					**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses-I
V	a) 20112DSC55A – Fuzzy Analysis b) 20112DSC55B - Formal Languages and Automata Theory
	Discipline Specific Elective Courses-I
VI	a) 20112DSC64A - Graph Theory b) 20112DSC64B - Mathematical Modelling

Open Electives

Semester	Open Elective Courses
VI	a) 201TNOEC-Tamil Ilakkiya Varalaru b) 201ENOEC-Journalism c) 201PHOEC-Instrumentation d) 201CEOEC-Food and Adulteration e) 201BTOEC- Wildlife Conservation f) 201CSOEC – E-Learning g) 201CAOEC-Web Technology h) 201CMOEC-Banking service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	Others	Total
I	17	-	-	-	-	-	17
II	13	4	-	-	1	-	18
III	17	-	-	-	2	-	19
IV	14	3	-	-	-	2	19
V	8	7	3	-	1	-	19
VI	8	4	4	2	4	1	23
Total	**77**	**18**	**7**	**2**	**8**	**3**	**115**

SEMESTER I

Course Code	Course Title	L	T	P	C
20110AEC11	Tamil -I	4	0	0	2

பிரிஸ்ட் நிகர்நிலைப் பல்கலைக்கழகம் வல்லம், தஞ்சாவூர்

பாட குறியீடு : தமிழ் முதல் பருவம்

முதலாம் ஆண்டு

இக்கால இலக்கியம் - செய்யுள், சிறுகதை , நாடகம், இலக்கிய வரலாறு

அலகு : 1.செய்யுள்

தாயுமானவ சுவாமிகள் - ஆகார புவனம் - சிதம்பர ரகசியம் - 40 அடிகள்

இராமலிங்க அடிகள் - திருவருட்பா - கருணை விண்ணப்பம் - 40 அடிகள்

கவிமணி தேசிக விநாயகம் பிள்ளை - மலரும் மாலையும் - 52 அடிகள்

பாரதியார் - புதுமைப்பெண்- 40 அடிகள்

பாரதிதாசன் - பாரதிதாசன் கவிதைகள் ,தமிழ் இனிமை , தமிழ் உணவு

அலகு : 2. செய்யுள்

நாமக்கல் கவிஞர் - தமிழ் தேன் - தமிழ் வளர்க்க சபதம் செய்வோம் , 40 அடிகள்

ந.பிச்சமூர்த்தி - வழித்துணை - கவிதை கூடன் , 42 அடிகள்

சுரதா - தேன்மழை, கைப்பை , 22 அடிகள்

கண்ணதாசன் - இலக்கியம் , ஒரு பானையின் கதை , 54 அடிகள்

அப்துல் ரகுமான் - சொந்த சிறகுகள், குப்பையை கிளறும் சிறகுகள், 80 அடிகள்

அலகு : 3. சிறுகதை

சு.சமுத்திரம் - வேரில் பழுத்த பலா

அலகு : 4. நாடகம்

கு. வெ. பாலசுப்பிரமணியன் , கௌதம புத்தர் (உரைநடை நாடகம்)

அலகு : 5. இலக்கிய வரலாறு

சிறுகதை , புதினம், நாடகம் உரைநடை , கவிதை , புதுக்கவிதை

Course Code	Course Title	L	T	P	C
20111AEC11	Advanced English-I	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the glossary terms, figures of speech
- To enhance vocabulary
- To learn how to edit and proof read
- To know the comparison and contrast and cause and effect forms
- To understand the impact of the speeches of famous people

Outcome:

- Develop vocabulary
- Learn to edit and do proof reading
- Read and comprehend literature

UNIT –I

Glossary of grammar terms

Figures of speech

UNIT – II

Foreign words and phrases

British and American Vocabulary

UNIT – III

Comparison and contrast

Cause and effect

UNIT – IV

Editing

Proof reading

UNIT – V

Speeches of famous people:

Mahatma Gandhi-Abraham Lincoln-Swami Vivekananda-John F. Kennedy

Reference book:

Author	Title of the book	Edition / Year	Publisher
Wren and Martin	English Grammar	2009	S.Chand& Company Ltd
Meenakshi Raman & Sangeetha Sharma	Technical Communication	Second Edition 2011	Oxford University Press
Sudhir Kumar Sharma	The World's Great Speeches	-	Galaxy Publishers

Course Code	Course Title	L	T	P	C
20111AEC12	English-I	4	0	0	2

Aim:

- To acquaint with learning English through literature

Objective:

- To improve English delightfully through simple poems, essays
- To throw light on fiction
- To read and comprehend literature

Outcome:

- Read and comprehend literature
- Appreciate the different types of poetry and prose

UNIT –I

Because I could not Stop for Death -Emily Dickinson

Stopping by Woods on a Snowy Evening -Robert Frost

UNIT – II

Enterprise -Nissim Ezekiel

Love poem for a wife -A.KRamanujam

UNIT –III

The Art of Reading - Lin Yutang

An Eco-Feminist Vision -ArunaGnanadason

UNIT –IV

The Merchant of Death -Nanda Kishore Mishra & John Kennet

She Spoke for all Nature -Young world ‘The Hindu’

UNIT –V

Oliver Twist -Charles Dickens**Text book:**

Author	Title of the book	Edition / Year	Publisher
S.Murugesan/Dr.K.Chellappan	The Art of Reading/ Experiencing Poetry	Reprint 2004	Emerald Publishers

Course code	Course Title	L	T	P	C
20112AEC13	**Differential Calculus and Vector Calculus**	5	0	0	3

Objectives:

This course is designed to give students a secure base in elementary calculus and vector calculus to allow them to tackle the mathematics needed in other sciences. Students wishing to do more mathematics will be given a good foundation from which they can proceed to other courses.

UNIT I:

Successive differentiation — Leibnitz theorem with proof — Problems, Partial derivative of a function.

UNIT II:

Maxima & Minima for functions of two variables — Lagrange multiplier method.

UNIT III:

Curvature (Cartesian, Polar and Pedal form) — evolutes.

UNIT – IV

Vector differentiation – velocity & acceleration vectors- Gradient of a vector directional derivative - Init normal vector- tangent plane, Divergence- Curl – Solenoidal & Irrotational vector- Double operators – Properties connecting grad, div & curl of a vector.

Unit –V

Vector integration –Line integrals – Conservative force field – Scalar field- Scalar potential- Work done by d Force- Surface integrals – Volume integrals.

Text Books:

1.Differential calculus — T.K.M. Pillai

2.Vector calculus — T.K.M. Pillai.

Reference:

T.K. Manickavasagam Pillai, Analytical Geometry (3D) & Vector calculus, Neq Gamma Publishing House, 1991

Learning outcomes

By the end of this course, you should:

- ✓ be able to manipulate, and solve problems using, successive differentiation & vector operators;
- ✓ be able to calculate Maxima & Minima for functions of two variables and Lagrange multiplier method
- ✓ be able to solve curvature, evolutes, asymptotes and envelopes in simple cases.
- ✓ be able to calculate gradient, divergence and curl vectors.

Course code	Course Title	L	T	P	C
20112AEC14	Trigonometry, Analytical Geometry 3 D and	5	0	0	3

Objectives:

This course is designed here to get sufficient ideas about integral calculus, trigonometry and analytical geometry to tackle the mathematics needed in other sciences.

UNIT I:

Expansions of cos nθ, sin nθ, $\cos^n\theta$, $\sin^n\theta$ (for positive integral values of n) — series for cos θ, sin θ**,** tan θ.

UNIT II:

Hyperbolic functions — Principal and general values of logarithms of complex numbers. Separation of real and imaginary parts — factorization.

UNIT III:

Summation of trigonometrical series — method of difference - sum of series of n angles in A.P, C+ is form, Gregory's series.

UNIT IV:

Analytical Geometry (3-D)

Spheres (Simple Properties only) general second degree equations to cone cylinder.

UNIT V:

Integralcalculus.

Evaluation of double and Triple integral — Beta and gamma integrals.

Text Books:

1. **Trigonometry** — T.K.M. Pillai
2. **Analytical Geometry (3D) And Integral Calculus** — T.K.M. Pillai

Learning outcomes

By the end of this course, you should:

- ✓ be able to manipulate the expansions of basic trigonometric functions
- ✓ be able to calculate summation of trigonometric series and Gregory's series
- ✓ understand the concept of analytical geometry and be able to use properties of spheres, cone and cylinder in real cases.
- ✓ be able to manipulate, and solve problems using, integral calculus

Allied- I- Paper -I PROGRAMMING IN C

Course code	Course Title	L	T	P
20120AEC15	Allied- I- Paper -I Programming In C	6	0	0

Objectives:

- To learn the concept of programming
- To understand input and output functions
- To study about Structures
- To learn Pointers in C Language

UNIT I :

Evolution and Applications of C - Structure of a C Program -Data Types - Declaration - Operators - Expressions - Type conversions -Built-in functions.

UNIT II :

Data Input and Output - Control statements: IF, ELSE-IF, GOTO, SWITCH, WHILE- DO, DO-WHILE, FOR, BREAK and CONTINUE.

UNIT III :

Functions:

Defining and accessing functions-passing parameters of functions -Arguments - Recursive functions -Storage classes.

Arrays:

Defining and processing Arrays -Multi dimensional arrays - passing arrays to functions -Arrays and strings String functions - String Manipulations.

UNIT IV :

Pointers

Pointers Declarations - Operations on pointers -pointers to functions - Pointer and Strings -pointers and arrays - array of pointers - Structures and pointers -unions.

UNIT V :

Data files -Opening, Closing, and processing files - Files with structures and unions

Register variables - Bit wise Operations - Macros- Pre-processing

Reference:

1. “ Programming with C” — ByronS.Gottfried — Schauni’s outline series — Tata McGrawHill publications.

2. “Let us C “— Yeswant kanetkar — BPB Publications.

Learning Outcomes:

At the end of the course, the student should be able to:

- Design C Programs for problems.
- Write and execute C programs for simple applications

Allied- I Practical -I PROGRAMMING IN C LAB

Course code	Course Title	L	T	P	C
20120AEC16L	Allied -I -Paper -I Programming in C Lab	0	0	3	2

Objectives

Programming in C Lab provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this content. In this course Quadratic Equation, Sum of Series (Sine, Cosine, e^x**),** Fibonacci Numbers using recursive functions, Sorting of given names in a1phabtical order, Matrix Operations (Addition, Subtraction, Multiplication — use functions) would be taught.

Students are able to the C program

1. Write a C program to find the roots of Quadratic Equation (all cases).
2. Write a C program to find the Sum of Series (Sine, Cosine, e^x**)**
3. Write a C program to reads an integer N and determine whether N is prime or not.
4. Write a C program to Finding factorials, generating Fibnoacci Numbers using recursive functions.
5. Write a C program to find the numbers in Ascending and Descending order (use it to find largest and smallest numbers).
6. Write a C program to find the sum of natural numbers using WHILE statement,
7. Write a C program for Sorting of given names in a1phabtical order.
8. Write a C program for Matrix Operations (Addition, Subtraction, Multiplication — use functions).
9. Write a C program for String Manipulation without using String functions (String length, String Comparison, String Copy, Palindrome checking, counting words and lines in strings — use function pointers).

Learning Outcomes:

At the end of the course, the student should be able to:

- Students learned program techniques
- Understand the concept of various functions and pointers
- A knowledge of writing C program
- Design/development of solutions

INDIAN CONSTITUTION

Course Code	Course Title	L	T	P	C
201ACLSICN	Indian Constitution	-	-	-	2

Objectives:

1. To make the students understand about the democratic rule and parliamentarian administration
2. To appreciate the salient features of the Indian constitution
3.To know the fundamental rights and constitutional remedies
4. To make familiar with powers and positions of the union executive, union parliament and the Supreme Court

To exercise the adult franchise of voting and appreciate the electoral system of Indian democracy.

Unit I::The making of Indian constitution

The constitution assembly organization –character -work salient features of the constitution- written and detailed constitution -socialism –secularism-democracy and republic.

Unit II: Fundamental rights and fundamental duties of the citizens

Right of equality -right of freedom- right against exploitation -right to freedom of religion- cultural and educational rights -right to constitutional remedies -fundamental duties .

Unit III: Directive principles of state policy

Socialistic principles-Gandhi an principles-liberal and general principles -differences between fundamental rights and directive principles

Unit IV: The union executive, union parliament and Supreme Court

Powers and positions of the president -qualification _method of election of president and vice president -prime minister -Rajya Sabah -Lok Sabah .the supreme court -high court -functions and position of supreme court and high court

Unit V: State council -election system and parliamentary democracy in India

State council of ministers -chief minister -election system in India-main features election commission-features of Indian democracy.

References:

1) Palekar.s.a. Indian constitution government and politics, ABD publications, India

2) Aiyer, alladi krishnaswami, Constitution and fundamental rights 1955.

3) Markandan. K.c.directive Principles in the Indian constitution 1966.

4) Kashyap. Subash c, our parliament, National book trust, New Delhi 1989

UNIVERSAL HUMAN VALUES

Course Code	Course Title	L	T	P	C
201ACLSUHV	Universal Human Values	-	-	-	2

Course Objectives :

The present course deals with meaning, purpose, and relevance of universal human values and how to inculcate and practice them consciously to be a good human being and realize one's potentials.

Course outcomes :

By the end of the course the learners will be able to:

1. Knowaboutuniversalhumanvaluesandunderstandtheimportanceofvaluesinindividual, social circles, career path, and national life.
2. Learnfromcasestudiesoflivesofgreatandsuccessfulpeoplewhofollowedandpractised human values and achieved self-actualization.
3. Become conscious practitioners of human values.
4. Realisetheirpotentialashumanbeingsandconductthemselvesproperlyinthewaysofthe world.

Unit I : Love & Compassion

- Introduction: What is love? Forms of love for self, parents, family, friend, spouse, community, nation, humanity and other beings, both for living and non-living
- Love and compassion and inter-relatedness
- Love, compassion, empathy, sympathy and non-violence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folk-lore
- Practicing love and compassion: What will learners learn gain if they practice love and compassion? What will learners lose if they don't practice love and compassion?
- Sharing learner's individual and/or group experience(s)
- Simulated Situations
- Case studies

Unit II: Truth

- Introduction: What is truth? Universal truth, truth as value, truth as fact(veracity,

  Sincerity, honesty among others)

- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folk-lore
- Practicing Truth: What will learners learn/gain if they practice truth? What will learners lose if they don't practice it?
- Learners' individual and/or group experience(s)
- Simulated situations
- Case studies

Unit III :Non-Violence

- Introduction: What is non violence? Its need. Love, compassion, empathy sympathy

  for others as pre-requisites for non-violence

- Ahimsa as non-violence and non-killing
- Individuals and organizations that are known for their commitment to non-violence
- Narrativesandanecdotesaboutnon-violencefromhistory,andliteratureincluding

  local folklore

- Practicing on-violence: What will learners learn/gain if they practice non- violence? What will learners lose if they don't practice it?
- Sharing learner's individual and/or group experience(s) about non-violence
- Simulated situations
- Case studies

Unit IV: Righteousness

- Introduction: What is righteousness?
- Righteousness and *dharma*, Righteousness and Propriety

- Individuals who are remembered in history for practicing righteousness
- Narratives and anecdotes from history, literature including local folklore
- Practicing righteousness: What will earners learn/gain if they practice righteousness? What will learners lose if they don't practice it?
- Sharing learners' individual and/or group experience(s)
- Simulated situations
- Case studies

Unit V:Peace

- Introduction: What is peace? Its need, relation with harmony and balance
- Individuals and organizations that are known for their commitment to peace
- Narratives and Anecdotes about peace from history, and literature including local folklore
- Practicing peace: What will learners learn/gain if they practice peace? What will learners lose if they don't practice it?
- Sharing learner's individual and/or group experience(s) about peace
- Simulated situations
- Case studies

Unit VI: Service

- Introduction: What is service? Forms of service, for self, parents, family, friend, spouse, community, nation, humanity and other beings—living and non-living, persons in distress or disaster.

- Individuals who are remembered in history for practicing this value.
- Narratives and anecdotes dealing with instances of service from history, literature including local folklore
- Practicing service: What will earners learn/gain gain if they practice service? What will learners lose if they don't practice it?
- Sharing learners' individual and/or group experience(s) regarding service
- Simulated situations
- Case studies

Unit VII: Renunciation(Sacrifice)

- Introduction: What is renunciation? Renunciation and sacrifice. Self-restrain and

  Ways of overcoming greed. Renunciation with action as true renunciation

- Individuals who are remembered in history for practicing this value.
- Narratives and anecdotes from history and literature, including local folklore about individuals who are remembered for their sacrifice and renunciation.
- Practicing renunciation and sacrifice: What will learners learn/gain if they practice Renunciation and sacrifice? What will learners lose if they don't practice it?
- Sharing learners' individual and/or group experience(s)
- Simulated situations
- Case studies

Course Code	Course Title	L	T	P	C
20110AEC12	Tamil -II	4	0	0	2

பெரியார் நிகர்நிலைப் பல்கலைக்கழகம் வல்லம், தஞ்சாவூர்

பாட குறியீடு : தமிழ் இரண்டாம் பருவம்

முதலாம் ஆண்டு

செய்யுள் , பக்தி இலக்கியம், சிற்றிலக்கியம் , இலக்கிய வரலாறு

அலகு : 1. செய்யுள்:

1. திருஞானசம்பந்தர் தேவாரம் - கோளறு பதிகம்
2. திருநாவுக்கரசர் தேவாரம் - தனிக் குறுந்தொகை
3. சுந்தரர் தேவாரம் - திருநொடித் தான் மலை
4. மாணிக்கவாசகர் - திருவாசகம் - திருப்பொன்னூசல்

அலகு : 2 . செய்யுள் :

5. குலசேகராழ்வார் - பெருமாள் திருமொழி
6. நம்மாழ்வார் திருவாய் மொழி - இரண்டாம் பத்து - வைகுந்த உபதேசம்
7. ஆண்டாள் - நாச்சியார் திருமொழி - திருமணக்கனவை உரைத்தல்
8. திருமங்கை ஆழ்வார் - சிறிய திருமடல்

அலகு : 3 . செய்யுள் :

9 . திருமூலர் - மூன்றாம் திருமுறை

10 . குமரகுருபரர் - மீனாட்சியம்மை பிள்ளை - தமிழ் வருகைப் பருவம்

11 . திரிகூடராசப்பக்கவிராயர் - குற்றாலக்குறவஞ்சி - குறத்தி நாட்டு வளம் கூறுதல்

12 . வீரமாமுனிவர் - திருக்காவலூர்க் கலம்பகம்

அலகு : 4 . புதினம்

13 . கு.வெ. பாலசுப்ரமணியன் - காவலாய்

அலகு : 5 . இலக்கிய வரலாறு

14 . சைவ வைணவ இலக்கியங்கள் , சிற்றிலக்கியங்கள் , (பள்ளு - பிள்ளைத்தமிழ் ,- பரணி)

Course Code	Course Title	L	T	P	C
20111AEC21	Advanced English-II	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To understand the format of e-mail, fax and memos
- To write itinerary, checklist, invitation, circular, instruction, recommendations
- To understand the impact of the biographies of famous people

Outcome:

- Develop technological skill
- Able to write in a variety of formats
- Read biographies and develop personality

UNIT –I

E-mail

Fax

Memos

UNIT – II

Itinerary

Checklist

UNIT – III

Invitation

Circular

UNIT – IV

Instruction

Recommendations

UNIT – V

Biographies of famous people:

Mother Teresa-Madam Curie-Charles Chaplin-Vikram Sarabhai

Text Book

Author	Title of the book	Edition / Year	Publisher
Meenakshi Raman & Sangeetha Sharma	Technical Communication	2011	Oxford University Press
Rajendra Pal &J.S.Korlahalli	Business Communication	2015	Sultan

Course Code	Course Title	L	T	P	C
20111AEC22	**English-II**	**4**	**0**	**0**	**2**

Aim:

- To acquaint learners with different trends of writing

Objective:

- To acquire language skills through literature
- To enable the students to appreciate literature
- To develop the conversational skills through one act plays

Outcome:

- Appreciate different forms of literature
- Acquire language skills through literature
- Broaden the horizon of knowledge

UNIT – I

Ecology -A.K. Ramanujan

Gift -Alice Walker

The First Meeting -Sujata Bhatt

UNIT –II

Fueled -Marcie Hans

Asleep -Ernst Jandl

Buying and selling -Khalil Gibran

UNIT –III

The End of living and The Beginning of Survival - Chief Seattle

My Wood - E.M.Forster

The Meeting of Races - Rabindranath Tagore

UNIT – IV

The Refugee -K.A. Abbas

I Have a Dream -Martin Luther king

Those People Next Door -A.G. Gardiner

UNIT – V

Marriage is a private Affair -Chinua Achebe

The Fortune Teller -Karel Capek

Proposal -Anton Chekov

Text book:

Author	Title of the book	Edition / Year	Publisher
Gowri Sivaraman	Gathered Wisdom	Reprint 2010	Emerald Publishers

Course code	Course Title	L	T	P	C
20112AEC23	Core -III Basic Mathematics III (Integrals and Differential Equations)	5	0	0	3

INTEGRALS AND DIFFERENTIAL EQUATIONS

UNIT I:

Properties of definite integrals and solve standard problems. Reduction formulae- $\int x^n e^{ax}\,dx, \int x^n \cos ax dx, \int \sin^n x\,dx, \int \cos^n x\,dx, \int \cos^m x \sin nx dx$ and problems based on above types working problems based on $\int \sin^m x \cos^n x\,dx$

UNIT II:

Second order differential equation with constant coefficients - $e^{\alpha x} g(x)$,x sin x , x cos x, , x^2cos x types only and with Variable coefficients- Variation of parameters

UNIT III:

Partial differential equations. Formation of equation — General, particular and complete integrals of PDE — Lagrange's method four standard forms

UNIT IV:

Laplace Transforms: Laplace transform and its application for solving ordinary differential equations — convolution theorem for Laplace transform — problems.

UNIT V:

Fourier series: Periodic functions — Dirichlet conditions (Without Proof) Odd and Even functions- change of interval — Half range series.

Reference

Calculus - T.K.M.Pillai, Arumugam and S.Narayanan.
Differential equations - S.Narayanan

SEQUENCE AND SERIES

Course code	Course Title		T	P	C
20112SEC24	Core -III Basic Mathematics III (Integrals and Differential Equations)	5	0	0	4

UNIT 1:

Sequence, Limits, Convergence-Cauchy's general principle of convergence- Cauchy's first theorem on Limits-Bounded sequences-Monotonic sequence always tends to a limit, finite or infinite - Limit superior and limit inferior.

UNIT 2:

Infinite series-Definition of convergence, Divergence and Oscillation-Necessary Condition for Convergence - Convergence of $\Sigma \mathbf{1 / n^p}$ and Geometric series. Comparison test,D 1 Alembert's ratio test and Raabe's test –Simple problems.

UNIT 3:

Cauchy's condensation test, Cauchy's root test and their simple problems Alternative series with simple problems.

UNIT 4:

General summation of series including successive difference and recurring series.

UNIT 5:

Inequalities - Geometric and Arithmetic means Weistrass inequalities- Cauchy's inequality.

TEXT BOOK:

Alebra Volume I & Volume II T.K.M.Pillai (Relavant problems only)

Unit I : Chapter 2 (4.7)

Unit II : Chapter 2 (8-14,16,18,19)

Unit III : Chapter 2 (15,17,21-24)

Unit IV : Chapter 5

Unit V : Chapter 4 (second volume)

General Reference

Sequence and series: Arumugam and Isaac

Course code	Course Title	L	T	P	C
20120AEC25	Allied -I-Paper-II Web Programming	5	1	0	5

Objectives

- give you a general understanding of how a computer works
- introduce you to assembly-level programming
- prepare you for future courses. .

UNIT-I:

Introduction to HTML- Head and body sections- Hyper text and Link in HTML documents.

UNIT-II:

Designing the body section- Managing images in HTML.

UNIT-III:

Ordered and Unordered Lists –Table Handling.

UNIT-IV:

DHTML and Style Sheet – Frames.

UNIT-V:

A Webpage design project – Forms.

REFERENCE BOOKS:

1. World Wide Web Design with HTML – c.Xavier –Tata McGraw-Hill-2000.
2. Principles of web design –Joel Sklar –Vikas Publishing House 2001.

Learning outcomes

By the end of this course, you should be able to:

- describe the fetch-execute cycle of a computer
- understand the different types of information which may be stored within a computer memory
- write a simple assembly language program

Allied- I Practical—II WEB PROGRAMMING LAB

Course code	Course Title	L	T	P	C
20120AEC26L	Allied-I Practical-II Web Programming Lab	0	0	3	2

Objectives

1. To create a fully functional website with mvc architecture
2. To develop an online book store
3. To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language

1. Create a Web page for ABC INFOTECH LTD., with necessary images and marquee.

2. Create Web pages which displays the menu card of a hotel. The first page should contain the list of items available. After selection of one item, the corresponding details should be displayed on the next page.

3. Create a Web page which displays the balance sheets for the given list of companies (same as above problem).

4. Create a Web page for XYZ INFOTECH LTD., to display the company profile employee details balance sheet, receive resume, customer service using links.

5. Using frames create web pages *for* a travel agency

6. Create a Web page using forms for our college students admission process. (Use list box, push button, radio button, command button, rich text box, text box, etc where ever applicable)

7. Create a Web page which receives suggestions from customers for a software development & consultancy agency using necessary.

Learning outcomes

By the end of this course, you should be able to:

- Will create a fully functional website(online book store) using mvc architecture
- Will create a complete translator for a mini language
- Understand the basic terminology used in computer programming
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.

Course code	Course Title	L	T	P	C
201ACLSCOS	Communication Skills	-	-	-	2

Course Objectives :

This course has been developed with the following objectives:

1. Identify common communication problems that may be holding learnersback
2. Identify what their non-verbal messages are communicating toothers
3. Understand role of communication in teaching-learningprocess
4. Learning to communicate through the digitalmedia
5. Understand the importance of empatheticlistening
6. Explore communication beyondlanguage.

Course Outcome :

By the end of this program participants should have a clear understanding of what good communication skills are and what they can do to improve their abilities.

Unit I :Listening

- Techniques of effective listening
- Listening and comprehension
- Probing questions
- Barriers to listening

Unit II: Speaking

- Pronunciation
- Enunciation
- Vocabulary
- Fluency
- Common Errors

Unit III :Reading

- Techniques of effective reading
- Gathering ideas and information from a given text
    i. Identify the main claim of the text
    ii. Identify the purpose of the text
    iii. Identify the context of the text
    iv. Identify the concepts mentioned
- Evaluating these ideas and information
    i. Identify the arguments employed in the text
    ii. Identify the theories employed or assumed in the text
- Interpret the text
    i. To understand what a text says
    ii. To understand what a text does
    iii. To understand what a text means

Unit IV: Writing and different modes of writing

- Clearly state the claims
- Avoid ambiguity, vagueness, unwanted generalizations and oversimplification of issues

- Provide background information
- Effectively argue the claim
- Provide evidence for the claims
- Use examples to explain concepts
- Follow convention
- Be properly sequenced
- Use proper signposting techniques
- Be well structured
    i. Well-knit logical sequence
    ii. Narrative sequence
    iii. Category groupings

- Different modes of Writing -
    i. E-mails
    ii. Proposal writing for Higher Studies
    iii. Recording the proceedings of meetings
    iv. Any other mode of writing relevant for learners

Unit V:Digital Literacy

- Role of Digital literacy in professional life
- Trends and opportunities in using digital technology in workplace
- Internet Basics
- Introduction to MS Office tools
    i. Paint
    ii. Office
    iii. Excel
    iv. PowerPoint

Unit VI: Effective use of Social Media

- Introduction to social media websites
- Advantages of social media
- Ethics and etiquettes of social media
- How to use Google search better
- Effective ways of using Social Media
- Introduction to Digital Marketing

Unit VII : Non-verbal communication

- Meaning of non-verbal communication
- Introduction to modes of non-verbal communication
- Breaking the misbelieves
- Open and Closed Body language
- Eye Contact and Facial Expression
- Hand Gestures
- Do's and Don’ts
- Learning from experts
- Activities-Based Learning

Reference Books

- SenMadhucchanda (2010), *An Introduction to Critical Thinking*, Pearson,Delhi
- Silvia P. J. (2007), *How to Read a Lot*, American Psychological Association, Washington DC

Course Code	Course Title	L	T	P	C
20110AEC13	Tamil -III	4	0	0	2

பிரிவு: நிலநிலை பல்கலைக்கழகம்- வங்கம், தஞ்சாவூர்

பாட குறியாடு :

தமிழ் மூன்றாம் பருவம்

இரண்டாம் ஆண்டு

செய்யுள், காப்பியங்கள் இலக்கிய வரலாறு

செய்யுள்

அலகு : 1

1. சிலப்பதிகாரம் - மனையறம் படுத்த காதை
2. மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை
3. சீவக சிந்தாமணி - விமலையார் இலம்பகம்

அலகு :2

4. பெரியபுராணம்- இளையான் குடிமாற நாயனார் புராணம்
5. கம்பராமாயணம் - கைகேயி சூழ்வினைப் படலம்

அலகு :3

6. சிறப்புராணம் - நபி அவதாரப் படலம் - 24 வரிகள்
7. தேம்பாவணி - வாமன் ஆட்சி படலம் - முதல் 5 பாடல்கள்

அலகு :4

8. நளவெண்பா - கலம்வரு காண்டம் (20 - 51)

அலகு . 5 : இலக்கிய வரலாறு

9. காப்பியங்கள் , ஐஞ்சிறு காப்பியங்கள் , புராணங்கள் , இதிகாசங்கள்

Course Code	Course Title	L	T	P	C
20111AEC31	**Advanced English-III**	**4**	**0**	**0**	**2**

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the organs of speech and the description and classification of speech sounds
- To understand consonant cluster, syllable, word accent and intonation.
- To know how to interpret graphics
- To write slogans and advertisements

Outcome:

- Understand phonetics
- Develop writing skill
- Able to develop creative writing

UNIT –I

The organs of speech

Classification of speech sounds

Vowels and Diphthongs

UNIT –II

Consonants

Consonant cluster

UNIT – III

Syllable

Word accent

Intonation

UNIT – IV

Idiom

Interpretation of graphics

UNIT – V

Slogan writing

Writing advertisement

Reference books:

Author	Title of the book	Edition / Year	Publisher
T.B. Balasubramaniyan	A text book of Phonetics for Indian Students	Reprint 2008	Macmillian
Meenakshi Sharma & Sangeetha Sharma	Technical Communication	2011	Oxford University Press

Course Code	Course Title	L	T	P	C
20111AEC32	English-III	4	0	0	2

Aim:

- To acquaint with learning English through literature

Objective:

- To sensitize language use through prescribed text
- To develop the conversational skills through one act plays

Outcome:

- Appreciate different types of prose
- Develop the conversational skills through one act plays
- Enhance the skill of making grammatically correct sentences.

UNIT – 1

The Doctor's World - R.K. Narayan

The Postmaster - Rabindranath Tagore

Princess September - E.Somerest Maugham

UNIT – II

The Price of Flowers -Prabhat Kumar Mukhopadhyay

The Open Window -Saki

The Model Millionaire -Oscar Wilde

UNIT –III

My Brother My Brother - Norah Burke

Uneasy Home Coming - Will F. Jenkins

Resignation - Premchand

UNIT –IV

The Referee -W.H. Andrews & Geoffrey Dreamer

The Case of the Stolen Diamonds -Farrell Mitchell

UNIT – V

The Dear Departed -Stanley Houghton

The Princess and the Wood Cutter -Alan Alexander Milne

Text book:

Author	Title of the book	Edition / Year	Publisher
SteuartH.King	Nine Short Stories	Reprint 2001	Blackie Books
T.Prabhakar	One – Act Play		Emerald

Course code	Course Title	L	T	P	C
20112AEC33	Core – V Number Theory	4	0	0	3

Core V - NUMBER THEORY

Objectives:

The objective is for the students to obtain a foundational knowledge of elements of Number Theory through step-by-step proofs of classical theorems, as well as to sharpen their skills through problem-solving.

UNIT 1:

THE FUNDAMENTAL THEOREM OF AR1THMETIC:- Introduction - Divisibility — Greatest Common divisor — Prime numbers — The fundamental theorem of arithmetic — The series of reciprocals of the primes — The Euclidean algorithm — The greatest Common divisor of more than two numbers.

UNIT 2:

ARITHMETICAL FUNCTIONS AND D1RICHLET MULTIPLICATION:- The motions function $\mu(n)$ — The Euler totient function — A relation connecting ϕ and μ - A product formula for $\mu(n)$ — The Dirichlet product of arithmetical functions — Dirichlct inverses and the Mobius inversion formula — the Mangoldt function $\Lambda(n)$ — Multiplicative functions — Multiplicative function and Dirichlet multiplication.

UNIT 3:

AVERAGES OF ARITHMETICAL FUNCTIONS:- The big oh notation Asymptotic equality of functions — Euler's summation formula — some elementary asymptotic formulas- the average order of d(n) — the average order of the divisor fraction $\partial\alpha(n)$ - the average order of $\phi(n)$.

UNIT 4:

SOME ELEMENTARY THEOREMS ON THE DISTRIBUTION OF PRIME NUMBERS:- Chebyschev's function $\psi(x)$*and* $\vartheta(x)$ - Relations connection $\vartheta(x)$ and $\pi(x)$ - some equivalent forms of the prime number theorem — Inequalities of $\pi(n)$ and P_n — Shapiro's Tauberian theorem — Application of Shapiro's theorem — An asymptotic formula for the partial sums $\sum p_n \leq (1/p)$ - the partial sums of the mobius function.

UNIT 5:

CONGRUENCES:- Definition and basic properties of congruence's — Residue classes complete residue systems — Linear congruence's — Reduced revised systems — Ruler Fernat's Theorem — Polynomial congruence's module Lagranges theorem — Applications of Lagrange's Theorem — Chinese Remainder theorem.

Reference:

Introduction to Analytic Number Theory by Tom. M.Apostal

For Unit 1 - Chapter 1

For Unit 1 - Chapter 2

For Unit 1 - Chapter 3

For Unit 1 - Chapter 4 Section 4,1 to 4.9 only

For Unit 1 - Chapter 5

General Reference:

1. Number theory : George E.Andrews

2. Introduction to theory of Number : G.H.I-lardy and E.M.Wright.

3. Basic Number Theory : S.B.Malilk.
4. Elements of Number Theory : S.Kumaravelu and Susheela Kumaravelu.

Learning Outcomes:

On satisfying the requirements of this course, students will have the knowledge and skills to:

- ✓ Solve problems in elementary number theory
- ✓ Apply elementary number theory to cryptography
- ✓ Develop a deeper conceptual understanding of the theoretical basis of number theory and cryptography
- ✓ Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime, and prime-factorization,

Core VI - NUMERICAL ANALYSIS

Course code	Course Title	L	T	P	C
20112AEC34	Core – VI Numerical Analysis	4	0	0	3

Objectives:

The roll of numerical analysis is to develop and analyze the numerical techniques. In this paper, different methods for finding the roots of algebraic and transcendental equations, solutions of simultaneous equations, solutions of ordinary differential equations
Solution of Linear systems, Numerical differentiation and integration interpolation with equal & unequal intervals are concentrated.

UNIT 1:

Solutions of Algebraic and transcendental equation iterative method, Bisection method-Aitken's process Method of False Position-Newton-Raphson methods.

UNIT II:

Finite differences-Forward differences backward differences Central differences symbolic relations-Newton's formula for interpolation. Interpolation with unevenly spaced points Lagrange's interpolation formula-divided differences and their propertiesNewton's General interpolation formula.

UNIT III: Numerical differentiation and integration

Numerical differentiation — integration — Trapezoidal rule and Simpson's rule.

UNIT IV: Solution of Linear systems Gaussian Elimination method — Iterative methods Jacobi and Gauss seidal Methods.

UNIT V:

Numerical solution of Ordinary -Differential Equations. Solution by Taylor's series - Picard's method of successive approximations -Euler method Modifies Euler's method -Runge Kutta methods -Predictor Corrector nethods - Adams method and Mines method.

Text Book

Numerical Methods in Science and Engineering by M.K.Venkatraman

Reference:

Introductory methods of Numerical Analysis By
S.S. Sastry- Prentice Hall of India Pvt. Ltd.

Chapters:2. 2.1 to 2.5
3. 3.1,3.3,3.6,3.9, 3.9.1,3.10,3.10.1
4. 4.2, 4.4, 4.4.1, 4.4.2
5. 5,4
6. 6.1 to 6.5 and 6.6.1 and 6.6.2

Learning Outcomes:

- Solving problems in algebraic and transcended equations
- Understand about finite differences
- Students develop and analyze numerical techniques
- Applying Various numerical methods to solve the ordinary differential equations
- Students gets the Research inquiry and analytical thinking abilities

Course code	Course Title	L	T	P	C
20118AEC35	Mathematical Statistics I	5	1	0	5

Objectives:

Statistics provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this content. In this course Basic Statistics, Probability, Baye's Theorem,random variables, discrete distributions, continuous functions, Bivariate Distributions, Correlation and Regression would be taught.

UNIT I:

Statistical data — Primary and Secondary data. Formation of frequency distribution Various measures of Central tendency and their merits and demerits various measures of dispersion and their merits and demerits Concept of Skewness and Kurtosis.

UNIT II:

Axiomatic Probability and classical, probability addition, multiplication and Bayc's theorems, Simple problems.

UNIT III:

Concept of random variable—discrete and continuous distribution function, probability mass function, probability density function — their properties — mathematical expectation — moment generating function — Simple problems.

UNIT IV :

Bivariate distribution - discrete and continuous, marginal and conditional distribution Statistical independence, Conditional expectation.

UNIT V:

Correlation — Rank Correlation, Karl Pearson's Correlation coefficient and its properties Linear Regression and its properties — Concept of multiple and partial correlation for three variables only.

Text Book:

1. Fundamentals of Mathematical Statistics — S.C.Gupta and V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Reference:

1. Fundamentals of Applied Statistics — S.C.Gupta and V.K.Kapoor. Sultan Chand & Sons.
2. Elementry Statistical Methods – S.P.Gupta, Sultan Chand & Sons, New Delhi.

Learning outcomes

By the end of this course, you should:

- Students gets the methodology for the planning and execution for any scientific enquiry
- Students learning statistical techniques and statistical data
- Understand the concept of random variables
- Understand the concept of Bivariate Distribution..
- A knowledge of constructions and uses correlation and regression.

Course code	Course Title	L	T	P	C
20118AEC36L	Mathematical Statistics – I lab	0	0	3	2

Objectives:

Statistics provides the methodology for the planning and execution for any scientificenquiry,which has been accepted as a valid tool in this content. In this course random variables, discrete distributions, continuous distributions would be taught.

List of Practical's

1. Measures of Central tendencies and measures of dispersion.
2. Moments.
3. Skewness and Kurtosis.
4. Fitting of binomial distribution.
5. Fitting of Poisson distribution.
6. Fitting of Normal distribution.
7. Correlation for Discrete Variables.
8. Correlation for Continuous Variables.
9. Rank Correlation.
10. Regression for Discrete Variables.
11. Regression for Continuous Variables.
12. Index Numbers.

Learning outcomes

By the end of this course, you should:

- Students learned statistical techniques and statistical data.
- Understand the concept of various distributions.
- Understand the concept of Correlation and Regression.
- Study of Index Numbers.

RESEARCH METHODOLOGY

Course code	Course Title	L	T	P	C
20112RMC37	Research Methodology	2	0	0	2

UNIT I

Research – Definition, Objectives, Motivation and purpose – types of research – Pure and applied, survey, case study experimental, exploratory – Concept of Research Design – Criteria of Good Research, Problems Encountered by Researchers in India. General guidelines for Good housekeeping & Lab-safety- Hygiene (Eye, foot, skin and hand protection) – Safety rules -Equipment protection – Respiratory protective equipment – safety equipment – Leaking, compressed gas cylinders – electrical safety. Fire – extinguishers.

UNIT II

Research Problem: Definition & need of research problem, Types & selection of proper research question and suitable research design with Examples, Literature types- compendia and tables of information, Reviews, General treatises, Monographs.

UNIT III

Methods of data collection – Primary and secondary data – observation – interview – Questionnaire – Tools for questionnaire; surveying & literature survey, spreadsheets, Technical writing, Construction of tools for data collection – testing validity – pilot study and pre-testing, Survey vs Experiment, Practical Exercises.

UNIT IV

Processing and analysis of data – editing – coding – transcription – tabulation –outline of statistical analysis – descriptive statistics – elements of processing through computer-packages for analysis (Excel).

UNIT V

Review of literature, Report writing – target audience – types of reports – contents of reports – styles and Conventions in reporting – steps in drafting a report. Technical Presentation

REFERENCE:

1. C.R. Kothari, Research Methodology-Methods & Techniques, 2nd Edition, New Age Int. (P) Ltd, 2004.

2. R. Gopalan, Thesis writing, Vijay Nicole Imprints Private Ltd., 2005.

3. S.P.Gupta, “Statistical Methods”, 7th Edition, S. Chand and Co. Ltd., 2004.

4. R.A Day and A.L. Underwood, Quantitative analysis, Prentice Hall, 1999.

5. Ajai.S.Gaur, Sanjaya S.Gaur, Statistical Methods for Practice and Research, Response, 2009

OFFICE AUTOMATION

Course Code	Course Title	L	T	P	C
201ACLSOAN	OFFICE AUTOMATION	-	-	-	2

Course Objective:

To provide an in-depth training in use of office automation, internet and internet tools. The course also helps the candidates to get acquainted with IT.

Course Outcomes:

After completion of the course, students would be able to documents, spreadsheets, make small presentations and would be acquainted with internet.

Unit I

Knowing the basics of Computers

Unit II

Word Processing (MS word)

Unit III

Spread Sheet (MS XL)

Unit IV

Presentation (MS Power Point)

Unit V

Communicating with Internet

Reference Books:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india

2.Microsoft Office 2007 Bible - John Walkenbach,HerbTyson,FaitheWempen,caryN.Prague,MichaelR.groh,PeterG.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.

3. Introduction to Information Technology - Alexis Leon, Mathews Leon, and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.

4. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications

5. https://en.wikipedia.org

6. https://wiki.openoffice.org/wiki/Documentation

7. http://windows.microsoft.com/en-in/windows/windows-basics-all-topics

Course Code	Course Title	L	T	P	C
20110AEC41	Tamil -IV	4	0	0	2

பிரிஸ்ட் நிகர்நிலைப் பல்கலைக்கழகம் வல்லம், தஞ்சாவூர்

பாட குறியீடு :தமிழ்.

நான்காம் பருவம் இரண்டாம் ஆண்டு

செய்யுள் , சங்க இலக்கியம், அற இலக்கியம் , செம்மொழி , இலக்கிய வரலாறு

அலகு . 1 : பண்டைய இலக்கியம் - நற்றிணை;

1. நெய்தல் - தோழி கூற்று - பாடல் எண் . 11
2. குறிஞ்சி - தலைவி கூற்று - பாடல் எண். 64
3. முல்லை - தலைவன் கூற்று - பாடல் எண்.142
4. பாலை - நற்றாய் கூற்று - பாடல் எண். 29
5. மருதம் - தலைவி கூற்று - பாடல் எண் . 70

பண்டைய இலக்கியம் குறுந்தொகை

1 . குறிஞ்சி - தோழி கூற்று - பாடல் எண் .1
2. முல்லை - செவிலித்தாய் கூற்று - பாடல் எண்.167
3. மருதம் - தலைவி கூற்று - பாடல் எண். 181
4. நெய்தல் - தலைவி கூற்று - பாடல் எண் . 290
5. பாலை - தலைவன் கூற்று - பாடல் எண் . 347

பண்டைய இலக்கியம் ஐங்குறுநூறு

1. மருதம் - கள்வன் பத்து - முதல் இரண்டு பாடல்கள்
2. நெய்தல் - தோழிக்குரைத்த பத்து - முதல் இரண்டு பாடல்கள்
3. குறிஞ்சி - குன்றக் குறவன் பத்து - முதல் இரண்டு பாடல்கள்
4. பாலை - இளவேனிற் பத்து - முதல் இரண்டு பாடல்கள்
5. முல்லை - பாசறைப் பத்து - முதல் இரண்டு பாடல்கள்

அலகு . 2 : கலித்தொகை

1 . பாலை - பாடல் எண். 2
2. குறிஞ்சி - பாடல் எண் . 37

Course Code	Course Title	L	T	P	C
20111AEC41	**Advanced English-IV**	**4**	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the objectives and types of interview
- To know the types of questions and answering techniques
- To prepare reviews and proposals
- To learn the grammatical forms
- To understand the meaning of a poem and write the content
- To write for and against a topic
- To draw a flowchart
- To write definitions

Outcome:

- Develop writing skill
- Comprehend and describe poems
- Learn interviewing skills

UNIT –I

Interviews

Objectives, types, ten success factors, ten failure factors - Planning and preparation –Presentation– Type of questions – Answering techniques.

UNIT – II

Flowchart

Proposals

UNIT – III

Discourse markers

Review

UNIT IV

Grammatical forms

Paraphrasing

UNIT –V

Definition

Writing for and against a topic.

Reference books:

Author	Title of the book	Edition / Year	Publisher
Rajendra Pal & J.S Korlahalli	Essentials of Business Communication	2015	Sultan Chand & Sons
Meenakshi Raman & Sangeetha Sharma	Technical Communication	2011	Oxford University Press
Wren & Martin	English Grammar & Composition	2009	S.Chand

Course Code	Course Title	L	T	P	C
20111AEC42	English-IV	4	0	0	2

Aim:

- To learn English through literature

Objective:

- To explore learners to the standard literary texts
- To impart wisdom through morally sound poems and essays
- To introduce Shakespeare to non-literature students

Outcome:

- Improve their ability to read and understand them
- Know the genius of Shakespeare
- Express one's views in writing

UNIT –I

My Last Duchess -Robert Browning

The Toys -Coventry Patmore

I, too -Langston Hughes

UNIT –II

How to be a Doctor -Stephen Leacock

My Visions for India -A.P.J. Abdul Kalam

Woman, not the weaker sex -M.K. Gandhi

UNIT –III

The Best Investment I ever made-A.J.Cronin

The Verger -W.S Maugham

A Willing Slave -R.K.Narayan

UNIT –IV

Macbeth

As You Like It

UNIT –V

Henry IV

Tempest

Text book:

Author	Title of the book	Edition / Year	Publisher
Devaraj	English for Enrichment	2012	Emerald Publishers
Board of Editors	Selected Scenes from Shakespeare Book I & II	2012	Emerald Publishers

Core VIII- OPERATIONS RESEARCH

Course code	Course Title	L	T	P	C
20112SEC43	Core –VIII Operations Research	4	0	0	3

Objectives:

Optimization is an important tool of modern applied mathematics. This course gives an idea to the student to recognize potential linear programming problems, to humiliate such problems as linear programming models, to employ the proper computational techniques to solve these problems, and to understand the mathematical aspects that tie together these elements of linear programming. The objective of this paper is to highlight the theoretical, computational and applied aspects of linear programming problems.

UNIT 1:

Introduction to operations Research — Elementary treatment of linear programming simplex Method <,=,>,= constraints.

UNIT 2:

Application to Transportation problem - Transportation Algorithm - Degeneracy in Transportation problem, unbalanced transportation problem, Assignment problem - The assignment algorithm - unbalanced assignment problem.

UNIT 3:

PERT and CPM network — critical and sub critical jobs — Determining the critical path.

Network calculation PERT networks probability aspect of PERT — PERT time — PERT cist (omitting Crashing)

UNIT 4:

Sequencing problem: Processing of n jobs through 2 machines - processing n jobs through 3 machines - processing 2 jobs through m machine

Games Theory: Characteristics of games —Maximin, Minmax, criteria of optimality — Dominance property - Algebraic and graphical method of solution of solving 2 x 2 games.

UNIT 5:

Inventory Theory--Variables in an Inventory problem Techniques of Inventory Control with known demand.

1. Purchasing model with no shortage. 2.. Purchasing model with shortages.
3. Manufacturing model with no shortages, 4. Manufacturing model with shortage.
5. Technique of Inventory Control with uncertain demand. 6.Buffer stock of safety stock model

[In all the units Application of the concept only. No book work]

Reference :

1. Operations Research by Kantiswarup, P.K. Gupta and Manmohan.
2. Resource Management Techniques (Operations Research) V.Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan.
3. Operations Research Methods and Applications, P.Mariappan

Learning outcomes

By the end of this course,

- Students using OR techniques in business tools for decision making
- Students develop PERT and CPM networks and finding the shortest path
- Understand the concept of sequencing problems and game theory
- Students gets the knowledge about inventory theory

Core IX- ASTRONOMY

Course code	Course Title		L	T	P	C
20112AEC44	Core – **IX** Astronomy		4	0	0	3

Objectives

Knowledge and understanding about celestial objects . Apply scientific reasoning to future astronomical discoveries to understand their validity as well as to everyday situations..Discuss the astronomical refraction zones of Earth, phases of Moon, seasonal

Variations, Kepler's law of motion, anomalies, eclipses.

UNIT-I:

Relevant properties of a sphere & relevant formulae for spherical trigonometry (all without proof) -Celestial sphere -Diurnal motion

UNIT-II:

Earth- Dip of the horizon-Twilight- Astronomical refraction- Tangent& Cosines Formula-Properties & simple problems applying them

UNIT-III:

Keplar's laws of planetary motion (statement only) -Newton's deductions from them -Three anomalies of the Earth and relation between them .

UNIT-IV:

Time: Equation of time – Seasons - Years and calendar – Conversion of time - Geocentric parallax - Heliocentric parallax- Aberration of light -simple problems in the above

UNIT-V:

Moon(except Moon's liberations)-Motions of planet(assume that orbits are circular- Eclipses

Reference

(1) S. Kumaravelu and Prof. Susheela Kumaravelu, Astronomy, SKV Publications,2004

UNIT-I — Chapterl&2

UNIT-II — Chapter 3 Section *1,2,5,6* & Chapter 4

UNIT-III — Chapter 6

UNIT-IV — Chapter 7, Chapter 8 Section 190 - 193 & Chapter 9

UNIT—V—Chapter12,13&14

Reference(s)

[1] J V.Thiruvenkatacharya, A Text Book of Astronomy, S. Chand and Co., Pvt Ltd., 1972

Learning outcomes

By the end of this course, you should:

- **Understand about celestial objects**
- Knowledge about Eclipses
- Different zones of Earth
- Astronomical refraction
- Different phases of Moon

Course code	Course Title	L	T	P	C
20118AEC46	Mathematical Statistics II	5	1	0	5

Objectives:

Statistics provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this content. In this course Central Limit Theorem, Discrete and Continuous Distributions, Small and Large Sampling would be taught.

UNIT I:

Tchebychev's inequality and weak law of large numbers — Simple form of central limit theorem for i.i.d random variables.

UNIT II:

Binomial, Poisson, Negative binomial, geometric distribution — Constants, moment generating function, Cumulant generating function.

UNIT III:

Continuous distribution — rectangular, exponential, beta, gamma distributions, Normal Distributions.

UNIT IV:

Test of Hypothesis—Null and alternative hypothesis(Concept only) One tail and two tail tests, tests of significance based on normal and t distribution for mean, simple correlation and properties.

UNIT V:

Test of significance based on chi square and F distributions for variance, test for goodness of fit and independence of attributes Analysis of variance — One way and two — way classifications with simple problems.

Text Book:

1. Fundamentals of Mathematical Statistics — S.C.Gupta and V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Reference:

1. Fundamentals of Applied Statistics — S.C.Gupta and V.K.Kapoor. Sultan Chand & Sons.
2. Elementry Statistical Methods – S.P.Gupta, Sultan Chand & Sons, New Delhi.

Learning outcomes

By the end of this course, you should:

- Understand the concept of Tchebychev's inequality and Applications of Central Limit Theorem.
- Understand the concept of Bivariate Distribution.
- A knowledge of test of significance based on parametric and non – parametric test.
- Understood the concept of sampling theory.
- Learned the concept of chi square, F-Test and ANOVA.

Course code	Course Title	L	T	P	C
20118AEC47L	Mathematical Statistics – II lab	0	0	3	2

Objectives:

Statistics provides the methodology for the planning and execution for any scientific enquiry, which has been accepted as a valid tool in this content. In this course, chi-square distribution, sampling distributions and analysis of variance would be taught.

List of Practical's

1.Goodness of fit. (Chi-square Test).
2. Attributes, Contingency table.
3. Large sample tests. Type I.
4. Large sample tests. Type II.
5.Large sample tests. Type III.
6.Large sample tests. Type IV.
7. t — tests.
8. Variance tests. (F-Test)
9. ANOVA.
10. Design of Experiments.

Learning outcomes

By the end of this course, you should:

- A knowledge of test of significance based on parametric and non – parametric test.
- Knowledge of Small and Large Sampling Tests.
- Design/development of solutions.

ENVIRONMENTAL STUDIES
(for under graduate students)

Course code	Course Title	L	T	P	C
201ENSTU45	Environmental Studies	2	0	0	2

Objectives:

- Creating the awareness about environmental problems among people.
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Motivating public to participate in environment protection and environment improvement.
- Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- Striving to attain harmony with Nature.

2. Nature of Environmental Studies

Definition, scope and importance.
Multidisciplinary nature of environmental studies
Need for public awareness.

3. Natural Resources and Associated Problems.

a) Forest resources: Use and over - exploitation, deforestation, dams and their effects on forests and tribal people.
b) Water resources: Use and over - utilization Of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources.
d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer -pesticide problems.
e) Energy resources: Growing energy needs, renewable and non -renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy.
f) Land resources: Solar energy, Biomass energy, Nuclear energy, Land as a resource, land degradation, man induced landslides, soil erosion and desertification,

Role of an individuals in conservation of natural resources.

4. Ecosystems

Concept of an ecosystem.
Structure and function of an ecosystem.
Producers, consumers and decomposers.
Energy flow in the ecosystem.
Ecological succession.
Food chains, food webs and ecological pyramids.
Introduction, types, characteristics features, structure and function of the following ecosystem:
a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem,
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

4. Biodiversity and its conservation

Introduction - Definition: genetic, species and ecosystem diversity.

Bio -geographical classification of India.

Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

India as a mega - diversity nation.

Western Ghat as a biodiversity region.

Hot— spot of biodiversity.

Threats to biodiversity habitat loss, poaching of wildlife, man -wildlife conflicts.

Endangered and endemic species of India.

Conservation of biodiversity: In - situ and Ex - situ conservation of biodiversity.

5. **Environmental Pollution**

Definition: Causes, effects and control measures of: Air pollution, Water pollution, soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

Role of a individual in prevention of pollution.

6. Social Issues and the Environment

Disaster management: floods, earthquake, cyclone, tsunami and landslides.

Urban problems related to energy Water conservation, rain water harvesting, watershed management

Resettlement and rehabilitation of people; its problems and concerns.

Environmental ethics: Issue and possible solutions.

Global wanTling, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation.

Consumerism and waste products.

7. Environmental Protection

From Unsustainable to Sustainable development.

Environmental Protection Act.

Air (Prevention and Control of Pollution) Act.

Water (Prevention and control of Pollution) Act.

Wildlife Protection Act.

Forest Conservation Act.

Population Growth and Human Health, Human Rights.

8. Field Work

Visit to a local area to document environmental assets — River / Forest / Grassland / Hill / Mountain.

or

Visit to a local polluted site — Urban / Rural *I* lad Listrial / Agricultural.

or

Study of common plants, insects, birds.

or

Study of simple ecosystems -— ponds, river, hill slopes, etc.

References:

1) Agarwal, K.C,200l, Environmental Biology, Nidi Pub. Ltd., Bikaner.

2) Bharucha Erach, The l3iodiversity of India, Mapin Publishing Pvt, Ltd., Ahmedabad 380013, India, Email: rn4pin@icenet.net (R)

3) Brunner R.C., 1989, 1-lazardous Waste Incineration, McGraw Hill Inc. 480p

4) Clank R.S., Marine Pollution, Clanderson Press Oxford (TB)

5) Cunningham, W.P. Cooper, T.H. Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Pub. Mumbai, Il96p

6) De A.K., Environmental Chemistry, Wiley Wastern Ltd.

7) Down to Earth, Centre for Science and Environment, New Delhi. (R)

8) Gleick, H., 1993, Water in crisis, Pacific Institute for studies in Dcv., Environment & Security. Stockholm Env Institute. Oxford Univ. Press 473p

9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bompay (R)

10) Heywood, V.K. & Watson, R.T.1995, Global Biodiversity Assessment, Crnbridge Univ. Press 1140 p.

11) Jadhav, H. and Bhosale, VJvI. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284p.

12) Mickinney, M.L. and School. R.M. 1196, Environmental Science Systems and Solutions, Web enhanced edition, 639p.

13) Miller T.G. Jr. Environmental Science. Wadsworth Publications Co. (TB).

14) Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA,574zp.

15) Rao M.N. and Dana, A.K. 1987, Waste Water Treatment, Wxford & IBH Publ. Co. Pvt. Ltd., 345p

16) Sharma B.K., 2001, Environmental Chemistry, Gokel PubI. Hkouse, Meerut

17) Survey of the Environment, The Hindu (M)

18) Townsend C., Harper, J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)

19) Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. 1 and II, Environmental Media (R)

20) Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno— Science Publications (TB)

21) Wagner K.D., 1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p,

22) Paryavaran shastra — Gholap T.N,

23) Paryavaran Sahastra — Gharapure

(M) Magazine

(R) Reference

(TB) Textbook

Learning Outcomes:

Students who graduate with a major in environmental science will be able to:

1. Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale;
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment;
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community;
4. Apply their ecological knowledge to illustrate and graph a problem and
5. describe the realities that managers face when dealing with complex issues; and
6. Understand how politics and management have ecological consequences.

Course code	Course Title	L	T	P	C
201ACLSLMS	Leadership and Management Skills	-	-	-	2

Course Objectives :

The Module is designed to**:**

- Help students to develop essential skills to influence and motivate others
- Inculcate emotional and social intelligence and integrative thinking for effective leadership
- Create and maintain an effective and motivated team to work for the society
- Nurture a creative and entrepreneurial mindset
- Make students understand the personal values and apply ethical principles in professional and social contexts.

Course Outcomes :

Upon completion of the course students will be able to:

1. Examine various leadership models and understand/assess their skills, strengths and

   abilities that affect their own leadership style and can create their leadership vision

2. Learnanddemonstrateasetofpracticalskillssuchastimemanagement,selfmanagement,handling conflicts, team leadership, etc.
3. Understand the basics of entrepreneurship and develop business plans
4. Apply the design thinking approach for leadership
5. Appreciate the importance of ethics and moral values for making of a balanced personality.

Unit I-Leadership Skills

Understanding Leadership and its Importance

- What is leadership?
- Why Leadership required?
- Whom do you consider as an ideal leader?

b. Traits and Models of Leadership

- Are leaders born or made?
- Key characteristics of an effective leader
- Leadership styles

- Perspectives of different leaders

c. Basic Leadership Skills

- Motivation
- Teamwork
- Negotiation
- Networking

Unit II--Managerial Skills

a. Basic Managerial Skills

- Planning for effective management
- How to organize teams?
- Recruiting and retaining talent
- Delegation of tasks
- Learn to coordinate
- Conflict management

b. Self Management Skills

- Understanding self concept
- Developing self-awareness
- Self-examination
- Self-regulation

Unit III--Entrepreneurial Skills

a. Basics of Entrepreneurship

- Meaning of entrepreneurship
- Classification and types of entrepreneurship
- Traits and competencies of entrepreneur

b. Creating Business Plan

- Problem identification and idea generation
- Idea validation
- Pitch making

Unit IV - Innovative Leadership and Design Thinking

a. Innovative Leadership

- Concept of emotional and social intelligence
- Synthesis of human and artificial intelligence
- Why does culture matter for today's global leaders

b. Design Thinking

- What is design thinking?
- Key elements of design thinking:
  - Discovery
  - Interpretation
  - Ideation
  - Experimentation
  - Evolution.

- How to transform challenges into opportunities?
- How to develop human-centric solutions for creating social good?

Unit V- Ethics and Integrity

a. Learning through Biographies

- What makes an individual great?
- Understanding the persona of a leader for deriving holistic inspiration
- Drawing insights for leadership
- How leaders sail through difficult situations?

b. Ethics and Conduct

- Importance of ethics
- Ethical decision-making
- Personal and professional moral codes of conduct
- Creating a harmonious life

Reference Books:

- Ashokan, M. S. (2015). *Karmayogi: A B biography of E. Sreedharan*. Penguin,UK.
- Brown, T. (2012). *Change by Design.* Harper Business
- Elkington, J., &Hartigan, P. (2008). *The Power of Unreasonable People: How Social Entrepreneurs Create Markets that Change the World*. Harvard Business Press.
- Goleman D. (1995). *Emotional Intelligence*. Bloomsbury Publishing India Private Limited
- Kalam A. A. (2003). *Ignited Minds: Unleashing the Power within India*. Penguin BooksIndia
- Kelly T., Kelly D. (2014). *Creative Confidence: Unleashing the Creative Potential WithinUs All.*WilliamCollins
- KurienV., & Salve G. (2012). *I Too Had a Dream*. Roli Books PrivateLimited
- Livermore D. A. (2010). *Leading with cultural intelligence: The New Secret to Success*. New York: American ManagementAssociation
- McCormackM.H.(1986).*WhatTheyDon'tTeachYouatHarvardBusinessSchool:Notes-FromA Street-Smart Executive*. RHUS
- O'Toole J. (2019) *The Enlightened Capitalists: Cautionary Tales of Business Pioneers Who Tried to Do Well by Doing Good.*Harpercollins
- SinekS. (2009). *Start with Why: How Great Leaders Inspire Everyone to Take Action.*Penguin
- Sternberg R. J., Sternberg R. J., &BaltesP. B. (Eds.). (2004). *International Handbook of Intelligence*. Cambridge UniversityPress.

SEMESTER – V

Course code	Course Title	L	T	P	C
20112AEC51	Core-X- Modern Algebra	5	0	0	4

Core X. MODERN ALGEBRA

Objectives:

Algebraic structures like Groups, Rings, Vector spaces are studied. The existence of subgroups of given order and the number of such subgroups are studied. The properties of Euclidean rings are discussed. Vector spaces and its properties which will be useful in the study of Field Theory are exposed. Finally, Lattices and their types and finite Boolean algebras are introduced.

UNIT 1:

Permutation Groups - Sub Groups — Cosets and Lagrange's theorem

UNIT II:

Normal subgroups - Quotient groups. -Homeomorphisms –Isomorphism

UNIT III:

RING THEORY:

Definition and Examples of Rings — Some special Classes of Rings — Homomorphisms - Ideals and Quotient Rings — More ideals and Quotient Rings — Euclidean Rings.

UNIT IV:

VECTORSPACE:

Elementary Basic concepts — Linear independence and Bases and spaces - Inner product spaces

UNIT V:

VECTOR SPACE:

Rank and Nullity-Matrix of a linear transformation

INNER PRODUCT SPACES:

Introduction-Definitions and examples-Orthogonality-Orthogonal Complement

Text Books:

"TOPIC IN ALGEBRA" by Arumugam . S and Isaac. A.T (Second edition)

For UNIT 1 - .Chapter 3: Section 3.4 to 3.8

For UNIT 2 - Chapter 3: Section 3.9 to 3.11

For UNIT 3 - Chapter 4: Section 4.1 to 4.14

For UNIT 4 - Chapter 5: Section 5.0 to 5.6

For UNIT 5 - Chapter 5: Section 5.7 to 5.8 , Chapter 6 section 6.0 to 6.3

General References

1.ModernAlgebra:A.R.Vasistha

2. Modern Algebra : Dr. S. Arumugam.

Learning outcomes

By the end of this course, you should:

- Knowledge and understand about Algebraic structures like Groups, Rings, Vector spaces
- Understood about Morphisms
- Skillness in Linear dep. , in- dep. and bases problems

Core XI - REAL ANALYSIS

Course code	Course Title	L	T	P	C
20112AEC52	Core –XI- Real Analysis	5	1	0	4

Objectives:

This paper is intended to cover all elementary topics in Real analysis such as sequence of real numbers, series of real numbers, continuous functions, connectedness, completeness and compactness. This paper is essential for studying Riemann integrals, fundamental theorem of calculus and improper integrals. This enhances the mathematical maturity of the students.

UNIT I: BASIC TOPOLOGY:-

Finite, countable and uncountable sets - Metric spaces - Compact spaces -Perfect sets - Connected sets.

UNIT II: NUMERICAL SEQUENCES AND SERIES:-

Convergent sequences - Subsequence's -Cauchy Sequences -Upper and Lower limits - some special sequences - Series -Series of Non negative Terms -The Number E - The Root and Ratio Tests-Power series -Summation by parts - Absolute convergence - Addition and Multiplication of series.

UNIT III: CONTINUITY:-

Limits of functions -continuous functions -Continuity and compactness - Continuity and connectedness-Discontinuity -Monotonic functions - Infinite limits and limits at infinity.

UNIT IV: DIFFERENTIATION:-

The derivative of a Real function - Mean value theorems - The continuity of Derivatives -L'Hospital's Rule -Derivatives of Higher order -Taylor's theorem.

UNIT V:

THE RIEMANN- INTEGRALS:- Definition and Existence of the Integral — Properties of the Integral — Integration and Differentiation.

Reference:

Principles of Mathematical Analysis by Walter Rudin, MC Graw Hill.

For UNIT I - Chapter-2

For UNIT II - Chapter-3 (section 3.1 to 3.50)

For UNIT III - Chapter-4

For UNIT IV - Chapter-5

For UNIT V - Chapter-6

General References:

1.Real Analysis : Bartle and Schuhest.

2. Real Analysis : Albert smith E.H.

Learning outcomes

By the end of this course, you should

- Knowledge about Connectedness, completeness and compactness
- Understanding the Riemann integrals, fundamental theorem of calculus
- Analyses the problem and finding the solution

Core XII - STATICS

Course code	Course Title	L	T	P	C
20112SEC53	Core – XII – Statics	5	1	0	4

Course Objectives:

Develop an understanding of the principles of statics, and the ability to analyze problems in a systematic and logical manner, including the ability to draw free-body diagrams.

UNIT-1

Forces and equilibrium –Forces-Resultant of two forces-Three forces related to a triangle –Equilibrium of a particle under three or more forces.

UNIT-II

Forces on a rigid body –Moment –Equivalent systems of forces-Parallel forces varigopn's theorem –Forces along a triangle-Couples –Equilibrium of a rigid body under three coplanar forces –Reduction of coplanar forces into a force and a couple.

UNIT –III

Friction –Laws of friction-Coefficient of fiction, angle and cone of Friction-Limiting equilibrium of a particle on a rough inclined plane, Tilting of a body Simple problems.

UNIT-IV

Virtual work-principle of virtual work-applied to a body or a system of bodies in equilibrium-Equation of virtual work-Simple problems.

UNIT-V

String –Equilibrium of string under gravity –common catenary-suspension bridge.

Reference:

(1)P.DURAIPANDIAN, Mechanics(vector treatment),S.chand &co.june 1997

UNIT-I chapter 2& chap 3 section 3.1

UNIT-II chapter 4 sec 4.1,4.3 to 4.9 & chap 5 sec 5.1

UNIT –III chap 2 sec 2.1,chap 3 sec 3.2,chap 5 sec 5.2

UNIT-IV chapter 8 ,UNIT-V chapter 9

Reference:

(1) M.K.Venkataraman, Statics, Agasthir publication ,2002

(2)A.V.Dharmapadham, Statics, S.Viswanathan publishers Pvt Ltd.,1979

(3)S.L.Lony ,Elements of Statics and Dynamics, part-1,A.I.T.Publishers,1991

Course Outcomes:

Students who successfully complete the course will demonstrate the following outcomes by tests, homework, and written reports:

1. An ability to construct free-body diagrams and to calculate the reactions necessary to ensure static equilibrium.
2. An understanding of the analysis of couples and friction.

Core-XIII- PROGRAMMING in C++

Course code	Course Title	L	T	P	C
20112SEC54	Core-XIII- Programming in C++	5	0	0	3

Objectives

- Utilize Object Oriented techniques to design C++ programs.
- Use the standard C++ library.
- Exploit advanced C++ techniques

UNIT 1: Principles of OOP — Software evolution — OOP paradigm — basic Concepts of OOP's — Object oriented languages — applications of 00 P. (Chapter 1)

UNIT 2: Introduction of C++ - tokens, keywords, identifiers, variables, operators, manipulators, expression and control structures in C++ - main function in function prototyping — call by reference — return by reference — function overloading and virtual functions (Chapter 2,3 &4)

UNIT 3: Classes and objects - Constructors and destructors — operator overloading and type conversions, (Chapter 5, 6 &7)

UNIT 4: Inheritance — single inheritance — multilevel inheritance —multiple inheritances — hybrid inheritance. (Chapter 8)

UNIT 5: Pointer — virtual functions and polymorphism — managing console I/O operations (Chapter 9 & 10)

Reference

Object oriented programming with C++ by E. Balagurusamy, 2e, Tarn. McGraw Hill publishing Co. Ltd., New Delhi.

Reference

1. C++ The Complete Reference by Herbeit Schildt.
2. OOP's with C++ from the foundation by N.R. Parsa, Dream Tech Press India Pvt. Ltd., New Delhi.

Learning Outcomes:

At the end of the course, the students should be able to:

- Able to understand and design the solution to a problem using object-oriented programming concepts.
- Able to reuse the code with extensible Class types, User-defined operators and function Overloading
- Understand functions and parameter passing.
- Understand object-oriented design and programming
- Understand dynamic memory allocation and pointers

Elective 1- FUZZY ANALYSIS

Course code	Course Title	L	T	P	C
20112DSC55A	Elective Paper – I Fuzzy Analysis	5	0	0	3

Objectives

Humans have a remarkable capability to reason and make decisions in an environment of uncertainty, imprecision, incompleteness of information, and partiality of knowledge, truth and class membership. The principal objective of **fuzzy logic** is formalization/mechanization of this capability.

UNIT I:

Fuzzy sets-basic types-basic concepts- α cuts-additional properties of α cuts-extension principle for fuzzy sets,

UNIT II:

Operation on fuzzy sets-types of operations- fuzzy complements- t-norms- fuzzy unions-combinations of operations.

UNIT III:

Fuzzy Arithmetic - Fuzzy numbers-Arithmetic operations on intervals Arithmetic operations on fuzzy numbers.

UNIT IV:

Fuzzy relations-Binary fuzzy relation-fuzzy equivalence relation-fuzzy compatibility relation-fuzzy ordering relations-fuzzy morphism.

UNIT V:

Fuzzy relation equation-general discussion-problem partition ing-soluti on method-fuzzy relation equations based on sup-i compositions-fuzzy relation equations based on w_i compositions.

Reference

FUZZY SETS AND FUZZY LOGIC
J.KLIR AND BOYUAN.
PNI,NEWDELHI,2004.

Learning outcomes

By the end of this course, you should,

- Be able to get the knowledge and understand Classical Sets vs Fuzzy Sets (FS) – Types of FS – Operations on FS
- Be able to get the knowledge and understand Zadeh's Extension Principle
- Be able to get the knowledge and understand Fuzzy Relations – Fuzzy Relational Equations – Possibility Theory :
- Be able to get the knowledge and understand Fuzzy Measures. Fuzzy relation equations based on sup-i compositions-fuzzy relation equations based on w_i compositions.

ELECTIVE - I - FORMAL LANGUAGES AND AUTOMATA THEORY

Course code	Course Title	L	T	P	C
20112DSC55B	Elective Paper-I-Formal Languages and Automata Theory	5	0	0	3

Objectives

1. The course aims to develop an appreciation of the theoretical foundations of computer science through study of mathematical and abstract models of computers and the theory of formal languages.

2. Theory of formal languages and use of various abstract machines as 'recognizers' and parsing will be studied for identifying the synthetic characteristics of programming languages.

3. To understand the fundamental models of computation that underlies modern computer hardware, software, and programming languages.

4. Explain computational thinking

Learn the foundations of automata theory, computability theory.

5. Discuss the applications of theory to other areas of computer science such as algorithms, programming languages, compilers, natural language translation, operating systems, and software verification.

UNIT I : The Theory of Automata — definition of an Automaton — Description of a finite Automaton — Transition system — properties of transition function — Acceptability of a string by a finite Automaton — Non deterministic finite state machine — the equivalence of DFA and NDFA — Mealy and Moore models — minimization of finite Automata.

UNIT II: Formal language — basic definition and examples — Chomsky classification of languages — language and their relation — recursive and recursively enumerable sets — operations on languages — languages and Automata.

UNIT III: Regular sets and regular grammars — regular expressions — finite Automaton and regular expressions — Pumping lemma for regular sets — application of pumping lemma.

UNIT IV: Context — free languages — context — free languages and derivation Trees — Ambiguity in context — free grammars — Simplification of context — free grammars — normal forms for context — free grammars.

UNIT V : Push Down Automata — basic definitions — Acceptance by PDA — Push Down Automata and context — free languages — parsing and Push down Automata.

Reference

K.L.P. Mishra and N. Chandrasekaran, "**Theory of Computer Science**", (Automata, languages and computation) — Prentice Hall of India private 2: limited — New Delhi, 3.

UNIT I : CHAPTER 2: (2.1 to2.9)

UNIT II : CHAPTER 3: (section 3.1 to 3.6)

UNIT III : CHAPTER 4 : (section 4.1 to 4.4)

UNIT IV : CHAPTER 5: (section 5.1 to 3.4)

UNIT V : CHAPTER 6 : (section 6.1 to 6.4)

Learning outcomes

By the end of this course you should be able ,

- Design deterministic and non-deterministic machines.
- Design the pushdown automata.
- Comprehend the hierarchy of problems arising in the computer sciences.
- The Student will get an idea for designing Compiler Design.
- The students will get knowledge about regular expressions and computability theory
- Acquire a fundamental understanding of the core concepts in automata theory and formal languages.
- An ability to design grammars and automata (recognizers) for different language classes.
- An ability to identify formal language classes and prove language membership properties.
- An ability to prove and disprove theorems establishing key properties of formal languages and automata.

PROFESSIONAL SKILLS

Course Code	Course Title	L	T	P	C
201ACLSPSL	Professional Skills	**-**	**-**	**-**	**2**

The Course Professional Skills is divided into two parts:

a) CareerSkills
b) Team Skills

A. Career Skills

Course Objectives :

The Objectives of the course are to help students/candidates:

1. Acquire career skills and fully pursue to partake in a successful career path
2. Prepare good resume, prepare for interviews and group discussions
3. Explore desired career opportunities in the employment market in consideration of an individual SWOT.

Course Outcomes :

At the end of this course the students will be able to:

1. Prepare their resume in an appropriate template without grammatical and other errors and using proper syntax
2. Participate in a simulated interview
3. Actively participate in group discussions towards gainful employment
4. Capture a self - interview simulation video regarding the job role concerned
5. Enlist the common errors generally made by candidates in an interview
6. Perform appropriately and effectively in group discussions
7. Explore sources (online/offline) of career opportunities
8. Identify career opportunities in consideration of their own potential and aspirations
9. Use the necessary components required to prepare for a career in an identified occupation (as a case study).

Unit I: Resume Skills

i. Resume Skills : Preparation and Presentation

- Introduction of resume and its importance
- Difference between a CV, Resume and Bio data
- Essential components of a good resume

ii. Resume skills : common errors

- Common errors people generally make in preparing their resume
- Prepare a good resume of her/his considering all essential components

Unit II: Interview Skills 5Hours

i. Interview Skills : Preparation and Presentation

- Meaning and types of interview (F2F, telephonic, video, etc.)
- Dress Code, Background Research, Do's and Don'ts
- Situation, Task, Approach and Response(STAR Approach)for facing an interview
- Interview procedure (opening, listening skills, closure, etc.)
- Important questions generally asked in a job interview(open and closed ended questions)

ii. Interview Skills : Simulation

- Observation of exemplary interviews
- Comment critically on simulated interviews

iii. Interview Skills : Common Errors

- Discuss the common errors generally candidates make in interview
- Demonstrate an ideal interview

Unit III: Group Discussion Skills

- Meaning and methods of Group Discussion
- Procedure of Group Discussion
- Group Discussion-Simulation
- Group Discussion - Common Errors

Unit IV: Exploring Career Opportunities

- Knowing yourself – personal characteristics
- Knowledge about the world of work, requirements of jobs including self-employment.
- Sources of career information
- Preparing for a career based on their potentials and availability of opportunities

Reference

Please check IT-ITeS Sector Skills Council readiness programs namely

- Foundation Skills In IT (FSIT) -Refer the websites like https://www.sscnasscom.com/ Ssc-projects/capacity-building-and-development/training/fsit/and

- GlobalBusinessFoundationSkills (GBFS)–Referwebsiteslikehttps://www.sscnasscom. Com/ssc-projects/capacity-building-and-development/training

B. Team Skills

Course Objectives:

The objectives of the course are to make learners:

1. Understand the significance of Team Skills and help them in acquiring them
2. To help them design, develop and adapt to situations as an individual and as a team.

Course Outcomes:

By the end of this course the learners/candidates will be able to:

1. Use common technology messaging tools that are used in enterprises for flow of information and transition from command and control to informal communication during an online/offline team session
2. Actively use and operate online team communication tools: Webinar, Skype, Zoom, Google hangout etc
3. Appreciate and demonstrate Team Skills
4. Participate in a digital lifestyle conversant with computers, applications, Internet and nuances of cyber security
5. Explore (online) and identify career opportunities in consideration of their own potential and aspirations.
6. Discuss and articulate the key requirements of an entrepreneurial exercise
7. Empathies and trust colleagues for improving interpersonal relations
8. Engage in effective communication by respecting diversity and embracing good listening skills
9. Distinguish the guiding principles for communication in a diverse, smaller internal world
10. Practice interpersonal skills for better relations with seniors, juniors, peers and stakeholders
11. Project a good personal image and social etiquettes so as to have a positive impact on building of one's chosen career
12. Generate, share and maximise new ideas with the concept of brainstorming and the documentation of key critical ideas/thoughts articulated and action points to be implemented with timelines in a team discussion (as MOM) in identified applicable templates.

SEMESTER –VI

Core XIV - COMPLEX ANALYSIS

Course code	Course Title	L	T	P	C
20112AEC61	Core – XIV-Complex Analysis	5	0	0	3

Objectives:

This paper is an introduction to the theory of analytic functions of one complex variable. Properties of analytic functions, results on linear transformations, problems on complex integration are discussed. Calculus of residues are also studied.

UNIT — I: Analytic Functions:

Functions of complex variables-Limits theorems on limits-continuous functions functions-Diffetentiability-C.R. Equations-Analytic Functions Harmonic functions (section 2. 1 to 2.8)

UNIT — 2: Bilinear Transformations:

Elementary transformations-Bilinear Transformations-cross ratio-fixed points of bilinear transformations-Some special bilinear transformations. (Section 3. 1 to 3.5)

UNIT —3: Complex Integration:

Definite Integral-Cauchy's Theorem-Cauchy's integral formula-Higlier derivations (Section 6.1 to 6.4)

UNIT — 4: Series Expansions:

Taylor's series-Laurent series-Zeros of analytic functions-Singularities (Section 7.1 to 7.4)

UNIT— 5: Calculus of residues:

Residues- Cauchy's Residue theorem — Evaluation of definite integrals (Section 8. 1 to 8.3)

Reference:

1. Complex Analysis by T.K. Manikavasakam Pillai & Others Ananda Book Depot. Madras.
2. Functions of Complex Variable by E.G. Philips.
3. Complex Varuable by Dr. P.P. Gupta Kedar Nath Ram Nath Meerut — Delhi.
4. Functions of Complex Variable by J.N. Sharma Krishna Prakashan Mandir Meerut.

Learning outcomes

By the end of this course you should be able

- Represent complex numbers algebraically and geometrically,
- Define and analyze limits and continuity for complex functions as well as consequences of continuity,
- Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra,
- Analyze sequences and series of analytic functions and types of convergence,
- Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula, and
- Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.

Core XV - DYNAMICS

Course code	Course Title	L	T	P	C
20112SEC62	Core –XV Dynamics	5	1	0	3

Course Objectives:

Develop an understanding of the principles of dynamics, and the ability to analyze problems in a systematic and logical manner. Ability to analyze the dynamics of particles, systems of particles and rigid bodies.

UNIT-I:

Kinematics velocity-Relative velocity-Acceleration –coplanar motion components of velocity & acceleration-Newton's laws of motion.

UNIT-II:

Simple harmonic motion-Simple pendulum-Load suspended by an elastic string-projectile-Maximum height reached, range, time of flight-projectile.

UNIT-III:

Impulsive force-conversion of linear momentum-impact of a sphere & a plane-Direct & oblique impact of two smooth sphere –kinetic energy and impulsive.

UNIT-IV:

Central orbit –central force-Differential EQUATION TO A CENTRAL ORBIT IN polar & pedal coordinates-Given the central orbit, to find the law of force-Kepler's laws of planetary motion's.

UNIT-V:

Motion of a rigid body-Moment of inertia of simple bodies-Theorem of parallel & perpendicular axes-motion in two dimension-motion of a rigid body about a fixed axis.

TEXT BOOKS:

1. P.DURAIPANDIAN, VECTOR TREATMENT AS IN MECHANICS,

Unit-I-Chapter 1 & cha 2 sec 2.1, 2.1.1

Unit-II-Cha 12 sec 12.1 to 12.3 & cha 13

Unit-III-Cha 14

Unit –IV-cha 16

Unit-V-Cha 4 sec 4.2 cha 17 & cha 18

General References:

Dynamics – Dr. K.Viswanath Naik and Dr. M.S. Kasi.

Course Outcomes:

Students who successfully complete the course will demonstrate the following outcomes by tests, homework, and written reports:

A knowledge of internal forces and moments in members.

1. An ability to calculate centroids and moments of inertia.
2. A knowledge of kinematic and kinetic analyses and energy and momentum methods for particles and systems of particles.
3. A knowledge of kinematic and kinetic analyses and energy and momentum methods for rigid bodies.

Core XVI **– DISCRETE MATHEMATICS**

Course code	Course Title	L	T	P	C
20112AEC63	Core-XVI **Discrete Mathematics**	5	0	0	3

Objectives:

Discrete Mathematics is a bridge connecting various branches of Computer Science and Mathematics. In Discrete Mathematics, we essentially study various finite (discrete) structures of Mathematics which are essential to develop the various concepts of computer science.

UNIT 1 :

RELATIONS:

Cartesian Product of Two sets – Relations – Representation of Relation-Operations Relations-Equivalence Relation

FUNCTIONS:

Function and Operators- One-to-One , Onto Functions-Special Types of Functions-Invertible Functions- Compositions of Functions

UNIT 2:

LOGIC:

Introduction-TF –Statements-Connectives-Atomic and Compound Statements-Well Formed (Statements) Formulae-Truth Table of a Formula- Tautology-Tautological Implications and Equivalence of Formulae

UNIT 3:

LATTICES AND BOOLEAN ALGEBRA

Lattices – Some Properties of Lattices – New Lattices – Modular and Distributive Lattices- Boolean Algebra

UNIT 4:

RECURRENCE RELATIONS AND GENERATING FUNCTIONS:

Recurrence an introduction – Polynomials and their Evaluations- Recurrence Relations-Solution of Finite Order Homogeneous (liner) Relations-Solution of Non- homogeneous Relations-Generating Functions-Some Common Recurrence Relations-Primitive Recursive Functions- Recursive and Partial Recursive Functions

UNIT 5:

AUTOMATA,LANUAGES AND COMPUTATIONS:

Introduction-Finite Automata- Definition of Finite Automaton –Representation of Finite Automaton-Acceptability of a string by a Finite Automaton-Languages accepted by a Finite Automaton-Non-deterministic Finite Automata- Acceptability of a String by Non-Deterministic Finite Automata –Equivalence of FA and NFA

Text Books: Dr.M.K. Venkataraman and N. Sridharan.N.Chandrasekaran

For UNIT 1 - .Chapter 2: Section 2.1 to 2.21& Chapter 3 Section 3.1 to 3.13

For UNIT 2 - Chapter 9: Section 9.1 to 9.30

For UNIT 3 - Chapter 10: Section 10.1 to 10.34

For UNIT 4 - Chapter 5: Section 5.1 to 5.33

For UNIT 5 - Chapter 12: Section 12.1 to 12.18

Learning outcomes

Students who successfully complete the course will demonstrate the following outcomes by tests, homework, and written reports:

1. A knowledge of Relations and functions
2. A knowledge of logical reasoning is used in mathematics to prove theorems, in computer science to verify the correctness of programs and to prove theorems in physical science to draw the conclusions..
3. An ability to find the solutions of Recurrence relations.
4. A knowledge of to study on ordering relations.

Elective II - GRAPH THEORY

Course code	Course Title	L	T	P	C
20112DSC64A	Elective Paper –II Graph Theory	5	0	0	3

Objectives:

Graph Theory is an integral part of Discrete Mathematics. It has applications to many fields, including computer science, physics, chemistry, psychology and sociology. In this course we teach basic topics in graph theory 20 such as Trees, Directed graphs, Connectivity, Euler tours, Hamilton cycles, Matchings, Colourings, Planar graphs

UNIT 1: Definitions of graph — finite and infinite graphs — incidence and degree isolated and pendent vertices — isomorphism — sub graphs — walks, puths and circuits — Connected and disconnected graphs — components — Euler graphs — Operations on graphs — more on Euler graphs — Harniltonian paths and circuits.

UNIT 2: Trees — Properties of trees — pendent vertices in a tree — distances and centers in a tree — Rooted and binary trees — Spanning trees — fundamental Circuits — Finding all spanning trees of a graph — Spanning trees in a weighted graph.

UNIT 3: Cut-sets — Properties of cut-set- All cut-sets in a graph — Fundamental circuits and cut-sets — connectivity and reparability.

UNIT 4: Planar graphs — Knratowski's two graphs — Representation of a planar graph — Detection of planarity — Geometrical dual — Combinational dual.

UNIT 5: Matrix representation of graphs — Incidence Matrix — circuit matrix Fundamental circuit and matrix and rank of the circuit matrix — cut-set matrix — Adjacency matrix. Chromatic number — Chromatic partitioning — Chromatic polynomial.

Treatment and content as in "Graph Theory with applications to engineering and computer science" by Narsing Deo, Prentice Hall of India, New Delhi.

References:

1. Invitation to graph Theory' by Dr.S. Arumugam and Dr. S. Ramachandran.
2. 'Graph Theory' — F. E-Haray, Narosa Publishing House, New Delhi — Madras - Bombay.
3. Graph Theory — S.A. Choudum, Macmillan India Limited —New Delhi — Madras.

Learning outcomes

By the end of this course, you should be able

- Knowledge in Graph Theory
- Understanding the properties of Graph Theory
- Understanding the concept of Kuratowski's graph
- Understanding Matrix representation of graphs

Elective II - MATHEMATICAL MODELLING

Course code	Course Title	L	T	P	C
20112DSC64B	Elective Paper –II Mathematical Modelling	5	0	0	3

Objectives:

Mathematical modelling can be used for a number of different reasons. How well any particular objective is achieved depends on both the state of knowledge about a system and how well the modelling is done.

1. Developing scientific understanding - through quantitative expression of current knowledge of a system.
2. Test the effect of changes in a system;
3. Aid decision making, including (i) tactical decisions by managers; (ii) strategic decisions by planners.

UNIT-I

Mathematical modeling through ordinary differential equations of first order: linear growth and decay models-nonlinear growth and decay models compartment models-dynamics problems-geometrical problems.

UNIT-II

Mathematical modeling through systems of ordinary differential equations of first order: population dynamics-epidemics-compartment models-economics-medicine. arms race, battles and international trade-dynamics.

UNIT-III

Mathematical modeling through ordinary differential equations of second order: planetary motions-circular motion and motion of satellites- Mathematical modeling through linear differential equations of second order-miscellaneous mathematical models.

UNIT-IV

Mathematical modeling through difference equations: simple models-basic theory of linear difference equations with constant coefficients-economics and finance population dynamics and genetics-probability theory.

UNIT-V

Mathematical modeling through Graphs: solutions that can be modeled through graphs-mathematical modeling in terms of directed graphs, signed graphs, weighted graphs and unoriented graphs.

Reference:

MATHEMATICAL MODELLING, J.N.KAPUR ,WILEYEASTERN LIMITED, NEWDELHI,1988.

Learning Outcomes:
Having successfully completed this module, you will be able to demonstrate knowledge and understanding of:

1) The concept of mathematical modelling.

2) The mathematical descriptions of some real systems.

3) Correct methodology when developing mathematical models.

4) Skill in applications

5) Designing and developing the solutions

Course Code	Course Title	L	T	P	C
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2

Unit I:Presentation Skills

- Types of presentations
- Internal and external presentation
- Knowing the purpose
- Knowing the audience
- Opening and closing a presentation
- Using presentation tools
- Handling questions
- Presentation to heterogenic group
- Ways to improve presentation skills overtime

Unit II: Trust and Collaboration

- Explain the importance of trust in creating a collaborative team
- Agree to Disagree and Disagree to Agree–Spirit of Teamwork
- Understanding fear of being judged and strategies to overcome fear

Unit III: Listening as a Team Skill

- Advantages of Effective Listening

Listening as a team member and team leader. Use of active listening strategies to encourage sharing of ideas (full and undivided attention, no interruptions, no pre- think, us **Credit Distribution**

- e empathy, listen to tone and voice modulation, recapitulate points, etc.).**Unit IV: Brain-storming**
  - Use of group and individual brainstorming techniques to promote idea generation.
  - Learning and showcasing the principles of documentation of team session outcomes

Unit V: Social and Cultural Etiquette

- Need for etiquette (impression, image, earn respect, appreciation, etc)
- Aspects of social and cultural/corporate etiquette in promoting team work
- Importance of time, place, propriety and adaptability to diverse cultures

Unit VI: Internal Communication

- Use of various channels of transmitting information including digital and

physical,
to team members.

Reference:

PleasecheckIT-ITeSSectorSkillsCouncilreadinessprogramnamelyGlobalBusinessFoundation Skills (GBFS) in website (https://www.sscnasscom.com/ssc-projects/capacity-building-and-development/training/gbfs/),and Generic and the entrepreneurial

COMMUNITY ENGAGEMENT

Course Code	Course Title	L	T	P	C
201ACLSCET	Community Engagement	-	-	-	2

Course Objectives:

- To develop an appreciation of rural culture, life-style and wisdom amongst students
- To learn about the status of various agricultural and rural development programmes
- To understand causes for rural distress and poverty and explore solutions for the same
- To apply classroom knowledge of courses to field realities and there by improve quality of learning

Course Outcomes:

After completing this course, student will be able to

- Gain an understanding of rural life, culture and social realities
- Develop a sense of empathy and bonds of mutuality with local community
- Appreciate significant contributions of local communities to Indian society and economy
- Learn to value the local knowledge and wisdom of the community
- Identify opportunities for contributing to community's socio-economic improvements

Unit I : Appreciation of Rural Society

Rural lifestyle, rural society, caste and gender relations, rural values with respect to community, nature and resources, elaboration of "soul of India lies in villages' (Gandhi), rural infrastructure

Unit II : Understanding rural economy & livelihood

Agriculture, farming, landownership, water management, animal husbandry, non-farm livelihoods and artisans, rural entrepreneurs, rural markets

Unit III : Rural Institutions

Traditional rural organizations, Self-help Groups, Panchayati raj institutions (Gram Sabha, Gram Panchayat, Standing Committees), local civil society, local administration

Unit IV : Rural Development Programmes

History of rural development in India, current national programmes: Sarva Shiksha Abhiyan, BetiBachao, BetiPadhao, Ayushman Bharat, Swatchh Bharat, PM Awaas Yojana, Skill India, Gram Panchayat Decentralised Planning, NRLM, MNREGA, etc.

Open Elective

Course Code	Course Title	L	T	P	C
201ENOEC	**Journalism**	**4**	**0**	**0**	**2**

Aim :

- To acquaint with the basic knowledge of journalism

Objective:

- To instil in the minds of students the different aspects of journalism
- To understand the different kinds of news
- To learn the qualities and duties of a reporter, editor and sub-editor
- To familiarize with the style and features of the different sections in a newspaper

Outcome:

- Become a journalist
- Explore the different kinds of news

UNIT- I

Journalism – Definition, Qualities of a journalist, Forms of journalism, Role and elements

UNIT- II

News – Definition, Kinds, Elements, Sources

UNIT- III

Reporters

UNIT- IV

The Editor and the Sub-editor

UNIT –V

Language of Journalism, Style

Qualities of a Writer

Writing a News story, Opinion Pieces, Reviews, Headlines, Editorials

Reference Book:-

Author	Title of the book	Edition / Year	Publisher
Susan	Journalism		
John Hogenberg	Professional Journalism	2012	
M.James Neal	News Writing and Reporting		Surjeet Publication
M.V Komath	The Journalist’s Handbook		

Course code	Course Title	L	T	P	C
201MAOEC	Development of Mathematics Skills	4	0	0	2

Aim:

- To understand the concepts from the five branches of mathematics

Objectives

- Knowledge and understanding are fundamental to study mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding students develop mathematical reasoning to make deductions and solve problems.
- To develop student's ability to apply both conventional and creative techniques to the solution of mathematical problems

Outcomes

- Know and demonstrate understanding of the concepts from the five branches of mathematics (Operations Research, Set Theory, Statistics, Matrices and Business mathematics)
- Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts
- Select and apply general rules correctly to solve problems including those in real-life contexts.

Unit I

Simple interest and compound interest

Unit II

Sinking fund – discounting – trade discount – quantity discount – cash discount

Unit III

Set theory – Series

Unit IV

Matrices – Determinants

Unit V

Assignment problems

References

P.A.Navanitham, Business Mathematics & Statistics

Kanti Swarup, P.K.Gupta and Manmohan, "Operations Research"

Course Code	Course Title	L	T	P	C
201PHGEC	Instrumentation	4	0	0	2

Aim:

Making and analyzing measurements is the primary task of the experimental physicist. This includes designing experiments. Most experimental work, whether in bench-top situations, or using complex instruments. To many physicists this can be as interesting and involving as the basic physics one is trying to do.

Objectives:

- To build the strong foundation in physics of students needed for the field of Instrumentation.
- To prepare student to apply reasoning informed by the contextual knowledge to practice.
- To provide opportunity for students to work as part of teams on multi-disciplinary projects.

UNIT – I: INTRODUCTION

Potentiometer - calibration of volt meter and ammeter, measurement of resistance, Principles of network theorems – Thevenin's and Norton's theorem – Bridges :

AC bridges – Maxwell, Owen, Schering and deSauty's bridges – Wien bridges.

UNIT – II: ELECTRONIC INSTRUMENTS – I

Basic characteristics of instruments – resolution – sensitivity - Audio frequency oscillator, Conversion of galvanometer into voltmeter and ammeter – resistance meter - Amplified D.C. meter – Chopper stabilized amplifier – A.C. Voltmeter using

rectifiers – Electronic multimeter – Differential voltmeter – Digital voltmeters –

Component measuring instruments (quantitative studies)

UNIT – III: ELECTRONIC INSTRUMENTS – II

Signal conditioning systems – DC and AC carrier systems – Instrumentation

amplifiers – Vibrating capacitor amplifier – Analog to digital data and sampling – A/D and D/A convertor (successive approximation, ladder and dual slope converseons).

Unit IV – Recording Devices

Recorders necessity – Recording requirements – Analog recorders – Graphic recorders – strip chart recorders – Galvanometer types recorders – Null type recorders.

Unit V – CRO

CRO – Construction and action – Beam transit time and frequency limitations – Measurement of potential, current, resistance, phase and frequency – Special purpose oscilloscopes – Sampling storage oscilloscope.

Books for Study

1. Electronic Instrumentation and Measurement techniques – W.D. Cooper and A.D. Helfrick – PHI – Third edn. – 1989

Learning Outcomes:

- Appreciate important practical aspects of theoretical knowledge: how important components work, when to impedance match, non-ideal behaviour of op-amps etc.
- Acquire a sound understanding of the role of noise in measurement systems and know how to apply noise reduction techniques.

Books for Reference:

1. A course in electrical and electronic measurements and Instrumentation – A.K. Sawhmey – DhanpatRai and Sons – 1990.

2. Electronic measurements and instrumentation – Oliver Cage – McGraw Hill – 1975.

Course Code	Course Title	L	T	P	C
201CEOEC	Food and Adulteration	4	0	0	2

Aim:

- To introduce students to food safety and standardization act and quality control of foods.

Objectives:

- To educate about common food adulterants and their detection.
- To impart knowledge in the legislatory aspects of adulteration.
- To educate about standards and composition of foods and role of consumer.

Outcomes:

- The students will have knowledge about different processing and preservation methods and principles involved.

Unit-I Introduction to Food Chemistry

Introduction to Food Chemistry- Water (Structure of water and ice, Physical constants of water, Types of water, Water activity) Composition of Food- Carbohydrates, Proteins, Lipids, Vitamins & Minerals.

Unit- II Food Pigments

Introduction- classification, types of food pigments- chlorophyll, carotenoids, anthocyanins, flavanoids.

Unit – III Food Preservation

Introduction - Importance, principle and Types.

High and low temperatures preservation - Pasteurization - Sterilization- Canning- Freezing- Refrigeration.

Unit – IV Food Additives

Introduction- antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti -caking agents, coloring and flavoring substance.

Unit-V Food Adulteration

Types of adulterants- intentional and incidental adulterants, methods of detection. Detection of common food adulterants in Spices , Grains, Coffee , Tea, Oil fats , Food colours and Milk. Health hazards and risks.

References:

1. The Food Safety and Standard ACT, 2006 – Seth & Capoor
2. Hand book of Food Adulteration and Safety Laws – Sumeet Malik
3. Food Science – B.Srilakshmi

Course Code	Course Title	L	T	P	C
201CSOEC	E Learning	4	0	0	2

COURSE OBJECTIVES

- Learn the basics of E-Learning concepts.
- Learn the content development techniques.

COURSE OUTCOMES

- Develop e – learning application on their own.
- Ability to develop contents for e-learning.
- To perform course management using tools.

UNIT I INTRODUCTION

Introduction – Training and Learning, Understanding elearning, components and models of e-learning, Advocacy of e-learning – benefits, learning styles, criteria for choosing, - Applications of E-learning.

UNIT II CONCEPTS and DESIGN

E-Learning Strategy, the essential elements of elearning strategy, Quality assuring e-learning, suppliers and resources, virtual learning environments, authoring tools, e-assessment, Learning Design Issues – purpose, general principles, designing live e-learning, designing self managed learning.

UNIT III APPLICATIONS

Moodle 2.0 E-Learning Course Development – Features, Architecture, Installation and Configuring Site.

UNIT IV COURSE MANAGEMENT

Creating – Categories, Courses, Adding Static Course Material – Links, Pages, Moodle HTML Editor, Media Files, Interacting with Lessons and Assignments – Evaluating Students – Quizzes and Feedback.

UNIT V ENHANCEMENT

Adding Social Activities - Chat, Forum, Ratings, Blocks – Types, Activities, Courses, HTML, Online Users – Features for Teachers.

REFERENCE BOOKS:

1. Delivering E-Learning: A complete Strategy for Design, Application and Assessment, Kenneth Fee, Kogan page, 2009.
2. Designing Successful e-Learning, Michael Allen, Pfeiffer Publication, 2007.
3. Moodle 2.0 E-learning Course Development, William Rice, PACKT, 2011.
4. Moodle 2.0 First Look, Mary Cooch, 2010.

Course Code	Course Title	L	T	P	C
201CAOEC	Web Technology	4	0	0	2

AIM

To equip the students with basic programming skill in Web Technology.

OBJECTIVE

- To understand the concepts and architecture of the Worldwide Web.
- To understand and practice mark up languages
- To learn Style Sheet and Frames

OUTCOMES:

- Acquire knowledge about functionalities of world wide web
- Explore markup languages features and create interactive web pages using them
- Learn and design Client side validation using scripting languages
- Acquire knowledge about Open source JavaScript libraries
- Able to design front end web page and connect to the back end databases.

UNIT I

Introduction to the Internet: networking- internet – email – Internet Technologies: modem internet addressing .

UNIT II

Internet browsers: Internet Explorer – Netscape navigator- Introduction to HTML: Html document – anchor tag – hyperlink.

UNIT III

Head and body sections: Header section – titles – links- colorful web page – sample html document – Designing the body section: paragraph – tab setting.

UNIT IV

Ordered and unordered lists: list – unordered list – heading in a list- order list- nested list.

UNIT V

Table handling: tables – table creation in html cell spanning multiple rows and columns- coloring cells- sample tables- frames frame set definition- nested frames set.

REFERENCE BOOKS

1.World Wide Web design with HTML – C. Xavier – Tata McGraw – Hill – 2000.

2. Principles of web design – Joel Sklar – Vikas publishing house 2001.

Course Code	Course Title	L	T	P	C
201CMOEC	Open Elective – Banking Service	4	0	0	2

AIM:

To Provide the Bank is financial institution which is involved in borrowing and lending money.

OBJECTIVE:

- To provide a lending money to firms, customers and home buyers.
- To provide keep money for customers
- To provide offering financial advice and related financial services, such as insurance.

UNIT – I

Commercial Banking – An Overview: Banking-Classification- Banking system- Universal Banking- Commercial Banking- functions – Role of Banks in Economic Development

UNIT – II

E-banking –An Overview: Meaning-Service-E-banking and Financial Services –Benefits-Internet Banking –Internet Banking Vs Traditional Banking –Mechanics of Internet Banking-Services

UNIT – III

Mobile Banking and Telephone Banking –An Overview: Meaning-Features- Registration-Services –Security Issues –Banking Facilities- Telephone Banking System – Drawbacks- Call Centers

Unit – IV

ATM and Electronic Money: Concept of ATM-Features-Functions-Strategic importance of ATM- Electronic Money – Categories –Merits – E-Money and Monetary Policy-Policy Issues for the RBI

Unit-V

EFT System and INFINET: Meaning- Steps in EFT- RBI Guidelines-EFT Systems Vs Traditional System - ECS-Features-Factors- Benefits –Handicaps -Applications

OUTCOME:

To help to gather knowledge on banking and financial system in India
To provide knowledge about commercial banks and its products
To create awareness about modern banking services like e-banking-banking and internet banking, ATM System
To introduce recent trends in banking system
To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks

REFERENCES:

1. Banking theory law and Practice

2. Banking Theory law and practice -Santhanam

3. Banking Awareness - N.K.Gupta

4. Management of Banking and financial Services-Padmalathasuresh,Justin paul .