Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu and Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)
Dr. N.G.P. – Kalapatti Road, Coimbatore-641048, Tamil Nadu, India
Web: www.drngpasc.ac.in |Email: info@drngpasc.ac.in | Phone: +91-422-2369100

REGULATIONS 2023-24 for Under Graduate Programme
(Outcome Based Education model with Choice Based Credit System)

B.Sc Mathematics Degree

(For the students admitted during the academic year 2023-24 and onwards)

Programme: B. Sc., Mathematics

Eligibility:

Candidate for admission to the first year of the **B.Sc. Mathematics** degree course shall be required to have passed the higher secondary examination conducted by the Govt. of Tamil Nadu with Mathematics as one of the subjects are only eligible or other examinations accepted as equivalent there to by the academic council, subject to such other conditions as may be prescribed there for. Business Mathematics, General Mathematics and Statistics subject at HSC cannot be considered as equivalent to Mathematics.

Programme Educational Objectives:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Mathematics is the key to success in the field of science and engineering.
2. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of mathematical ideas and tools to use them effectively in modeling, interpreting and solving the real world problems.
3. Mathematics plays an important role in the context of globalization of Indian economy, modern technology and we find the applications of Computers in all walks of life from Agriculture to Atomic research.
4. This course is aimed at preparing the students to cope with the latest developments and compete with students from other universities and put them on the right track.

PROGRAMME OUTCOMES:

On the successful completion of the program, the following are the expected outcomes.

PO Number	PO statement
PO1	The learner will able to relate the concept underlying standard applications of Mathematics, Physics and Statistics
PO2	The learner will have an understanding on basic pure and applied Mathematics and able to formulate the Mathematical arguments in logical manner
PO3	The learner can be able to illustrate Mathematical concepts effectively by oral, written,computing and graphical means
PO4	The learner will make use of the theories of Mathematics and their applications in real world problems
PO5	The learners can be able to identify the complex physical problems and apply the Mathematical techniques to solve them

Credit distribution

Credit distribution for all UG programmes

Part	Subjects	No.of Papers	Credit	Semester No.
I (12 Credits)	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I to IV
II (12 Credits)	English	4	4 x 3 = 12	I to IV
III (108 Credits)	Core (Credits 2,3,4,5)	17	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective (DSE)	3	3 x 4 =12	V & VI
	Skill Enhancement Course(SEC)	4	8	III ,IV,V& VI
	Industrial Training	1	2	V
IV (8 Credits)	Environmental Studies(AECC)	1	2	I
	Basic Tamil/ Advance Tamil /Human Rights &Women's Rights(AECC)	1	2	II
	Innovation & IPR/Innovation, IPR &Entrepreneurship (AECC)	1	2	VI
	Generic Elective(GE) (AEEC)	1	2	V
V (2 Credits)	NSS/NCC/YRC/RRC/Yoga/Sports/Clubs	-	2	I -II
TOTAL CREDITS			**142**	

CURRICULUM

B.Sc. Mathematics
A.Y : 23 - 24

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
First Semester										
Part - I										
231TL1A1TA	Language - I	Tamil-I	4	1	-	3	25	75	100	3
231TL1A1HA		Hindi-I								
231TL1A1MA		Malayalam-I								
231TL1A1FA		French – I								
Part – II										
231EL1A1EA	Language - II	English-I	4	-	1	3	25	75	100	3
Part – III										
232MT1A1CA	Core-I	Calculus with Scilab	4	2	-	3	25	75	100	4
232MT1A1CB	Core-II	Analytical Geometry with GEOGEBRA	4	1	-	3	25	75	100	4
232PY1A1IP	IDC-I	Physics - I	3	-	4	3	40	60	100	5
Part – IV										
233MB1A1AA	AECC-I	Environmental Studies	2	-	-	-	50	-	50	2
Part – V										
232MT1A1XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports/Club	-	-	-		50	-	50	1
Total			21	4	5				600	22

BoS Chairman/HoD
Department of Mathematics
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Sc...
APPROVED
BoS - 15th 12.06.23 | AC - 15th 14.07.23 | GB - 20th 05.8.23

Academic Council
CHAIRMAN
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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Second Semester										
Part – I										
231TL1A2TA	Language - I	Tamil-II	4	1	-	3	25	75	100	3
231TL1A2HA		Hindi-II								
231TL1A2MA		Malayalam-II								
231TL1A2FA		French – II								
Part – II										
231EL1A2EA	Language - II	English-II	4	-	1	3	25	75	100	3
Part – III										
232MT1A2CA	Core-III	Differential Equations	4	2	-	3	25	75	100	4
232MT1A2CB	Core-IV	Fourier Series and Integral Transforms	4	1	-	3	25	75	100	4
232PY1A2EP	IDC-II	Physics - II	3	-	4	3	40	60	100	5
Part – IV										
231TL1A2AA/ 231TL1A2AB/ 235CR1A2AA	AECC-II	Basic Tamil/ Advanced Tamil/ Human Rights and Women's Rights	2	-	-	-	50	-	50	2
Part – V										
232MT1A2XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports/ Club	-	-	-	-	50	-	50	1
Total			21	4	5				600	22

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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part – I										
231TL1A3TA	Language - I	Tamil-III	3	1	-	3	25	75	100	3
231TL1A3HA		Hindi-III								
231TL1A3MA		Malayalam-III								
231TL1A3FA		French – III								
Part – II										
231EL1A3EA	Language - II	English- III	3	1	-	3	25	75	100	3
Part – III										
232MT1A3CA	Core - V	Mechanics	4	1	-	3	25	75	100	4
232MT1A3CB	Core – VI	Probability Theory	4	1	-	3	25	75	100	4
232MT1A3CC	Core – VII	Numerical Methods	4	-	-	3	25	75	100	4
235CI1A3IA	IDC - III	Business Accounting	3	1	-	3	25	75	100	3
232MT1A3SA	SEC - I	Optimization Techniques	2	2	-	3	25	75	100	2
Total			23	7	-				700	23

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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part – I										
231TL1A4TA	Language – I	Tamil-IV	3	1	-	3	25	75	100	3
231TL1A4HA		Hindi-IV								
231TL1A4MA		Malayalam-IV								
231TL1A4FA		French – IV								
Part – II										
231EL1A4EA	Language - II	English –IV	3	1	-	3	25	75	100	3
Part – III										
232MT1A4CA	Core - VIII	Elements of Mathematical Analysis	4	1	-	3	25	75	100	4
232MT1A4CB	Core – IX	Mathematical Statistics	4	1	-	3	25	75	100	4
232MT1A4CC	Core – X	Mathematical Modeling	4	-	-	3	25	75	100	4
234DA1A4IA	IDC - IV	Introduction to Data Science	3	1	-	3	25	75	100	3
232MT1A4SA	SEC-II	Advanced Optimization Techniques	2	2	-	3	25	75	100	2
Total			23	7	-				700	23

BoS Chairman/HoD
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Dr. N.G.P. Arts and Science College
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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part – III										
232MT1A5CA	Core – XI	Modern Algebra	4	-	-	3	25	75	100	4
232MT1A5CB	Core – XII	Real Analysis	4	1	-	3	25	75	100	4
232MT1A5CC	Core – XIII	Number Theory	4	-	-	3	25	75	100	4
232MT1A5EP	Core – XIV Practical	Programming in MATLAB	3	-	4	3	40	60	100	5
232MT1A5SP	SEC – III Practical	R Programming	-	-	4	3	40	60	100	2
232MT1A5DA	DSE-I	Fuzzy Sets and Fuzzy Logic	4	-	-	3	25	75	100	4
232MT1A5DB		Discrete Mathematics								
232MT1A5DC		Mathematical Foundations in Cryptography								
232MT1A5TA	IT	Industrial Training	-	-	-	-	40	60	100	2
Part – IV										
	GE		2	-	-	-	50	-	50	2
Total			21	1	8				750	27

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part – III										
232MT1A6CA	Core - XV	Complex Analysis	4	-	-	3	25	75	100	4
232MT1A6CB	Core -XVI	Linear Algebra	4	1	-	3	25	75	100	4
232MT1A6EP	Core - XVII Practical	Fundamentals of Computing and Python Programming	3	-	4	3	40	60	100	5
232MT1A6SP	SEC-IV Practical	Linear Programming using Spreadsheet	-	-	4	3	40	60	100	2
232MT1A6DA	DSE-II	Cryptography	4	-	-	3	25	75	100	4
232MT1A6DB		Graph Theory								
232MT1A6DC		Mathematical Fundamentals in Pharmacokinetics								
232MT1A6DD	DSE-III	Combinatorics	4	-	-	3	25	75	100	4
232MT1A6DE		Automata Theory and Formal Languages								
232MT1A6DF		Mathematical models in Econometrics								
Part – IV										
233BC1A6AA	AECC-III	Innovation, IPR and Entrepreneurship					50	-	50	2
Total			21	1	8				650	25
***Grand Total**									4000	142

DISCIPLINE SPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

Semester V (Elective I)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	232MT1A5DA	Fuzzy Logic
2	232MT1A5DB	Discrete Mathematics
3	232MT1A5DC	Mathematical Foundations in Cryptography

Semester VI (Elective II)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	232MT1A6DA	Cryptography
2	232MT1A6DB	Graph Theory
3	232MT1A6DC	Mathematical Fundamentals in Pharmacokinetics

Semester VI (Elective III)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	232MT1A6DD	Combinatorics
2	232MT1A6DE	Automata Theory and Formal Languages
3	232MT1A6DF	Mathematical models in Econometrics

GENERIC ELECTIVE COURSE (GE)

The following are the course offered under Generic Elective Course

Semester V

S. No.	Course Code	Course Name
1	232MT1A5GA	Vedic Mathematics

EXTRA CREDIT COURSES

The following are the courses offered under self study to earn extra credits:

Semester III

S. No.	Course Code	Course Name
1	232MT1ASSA	History of Mathematics
2	232MT1ASSB	Introduction to Vedic Mathematics

UG - REGULATION (R5)

(2023-24 and onwards)

(OUTCOME BASED EDUCATION WITH CBCS)

1.NOMENCLATURE

1.1 Faculty: Refers to a group of programmes concerned with a major division of knowledge Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology, Computer Applications, Data Analytics, Cognitive Systems, Artificial Intelligence and Machine Learning and Cyber Security

1.2 Programme: Refers to the Bachelor of Science / Commerce /Arts stream that a student has chosen for study.

1.3 Batch: Refers to the starting and completion year of a programme of study. Eg. Batch of 2023–26 refers to students belonging to a 3 year Degree programme admitted in 2023 and completing in 2026.

1.4 Course: Refers to component of a programme. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ practical training / report writing / Viva- voce, etc., or a combination of these, to meet effectively the teaching learning needs.

a) **Core Course:**A course, which should compulsorily be studied by a candidate as a core requirement

b) **Inter Disciplinary Course (IDC):** A course chosen generally from a related discipline/subject with an intention to seek exposure in the discipline relating to the core domain of the student

c) **Discipline Specific Elective (DSE) Course**: Elective courses offered under main discipline/ subject of study.

d) **Skill Enhancement Courses (SEC):** Value-based and/or skill-based courses which are aimed at providing hands-on-training, competencies, skills, etc.

e) **Ability Enhancement Compulsory Courses (AECC):**Mandatory courses that lead to Knowledge enhancement. Environmental Science, Human Rights and Women's Rights, Basic Tamil/ Advanced Tamil, Innovation and IPR, Innovation, IPR and Entrepreneurship.

f) **Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective.

1.5 Project Work:

Course involving application of knowledge in problem solving / analyzing /exploring a real life situation / difficult problem. The Project work will be given in lieu of a Core paper.

Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

1.6 Extra Credits:

Extra credits shall be awarded for achievements in identified curricular/co-curricular/Extracurricular activities executed outside the regular class hours. Extra credits are not mandatory for completing the programme.

2. STRUCTURE OF PROGRAMME

2.1 PART- I: LANGUAGE- I

Tamil or any one of the languages namely Malayalam, Hindi and French will be offered under Part – I in the first four semesters.

2.2 PART- II: LANGUAGE- II

English will be offered during the first four semesters.

2.3 PART- III:

- Core Course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Industrial Training (IT)

2.4 PART- IV:

2.4.1 Ability Enhancement Compulsory Course (AECC):

The Ability Enhancement Compulsory Courses such as i)Environmental Studies, ii) Human Rights and Womens' Rights, iii) Innovation and IPR/ Innovation, IPR and Entrepreneurship are offered during I,II and VI Semester.

Basic Tamil

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take oneBasic Tamil coursein the second semester.

(OR)

Advanced Tamil

b) Those who have studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Advanced Tamil course in the second semester.

Note: Students who come under the above a+b categories are exempted from Human Rights and Women's Rights in the second semester.

Ability Enhancement Elective Course (AEEC)/Generic Elective (GE) An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective offered in V semester. (Theory/Practical/Non-Lab Practical)

2.5 PART- V: EXTENSION ACTIVITIES

The following extracurricular activities like NSS/YRC/NCC/RRC/Yoga/Sports/Clubs are offered under extension activities during semester I & II. Students will be evaluated based on their active participation in any one of the above activities. 75% Attendance is compulsory for extension activity.

3. CREDIT ALLOTTMENT

The following is the credit allotment:

- Lecture Hours (Theory) : 1 credit per lecture hour per week
- Laboratory Hours : 1 credit for 2 Practical hours per week
- Project Work : 1 credit for 2 hours of project work per week

4. DURATION OF THE PROGRAMME

The B.A. /B.Com./B. Sc. Programme must be completed within 3 years (6 semesters) and a maximum of 6 years (12 semesters) from the date of acceptance to the programme. If not, the candidate must enroll in the course determined to be an equivalent by BoS in the most recent curriculum recommended for the Programme.

5.REQUIREMENTS FOR COMPLETION OF A SEMESTER

Every student shall ordinarily be allowed to keep terms for the given semester in a program of his/ her enrolment, only if he/ she fulfills at least seventy five percent (75%) of the attendance taken as an average of the total number of lectures, practicals, tutorials, etc. wherein short and/or long excursions/field visits/study tours organised by the college and supervised by the faculty as envisaged in the syllabus shall be credited to his/her attendance. Every student shall have a minimum of 75% as an overall attendance.

6. EXAMINATIONS

The end semester examinations shall normally be conducted after completing 90 working days for each semester. The maximum marks for each theory and practical course shall be 100 with the following breakup:

a) Mark distribution for Theory Courses

Continuous Internal Assessment (CIA)	: 25 Marks
End Semester Exams (ESE)	: 75 Marks
Total	: 100 Marks

i) Distribution of Internal Marks

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45th working day)	5
2	Model (All 5 Units) (On completion of 85th working day)	5
3	Attendance	5
4	Library Usage	5
5	Skill Enhancement *	5
	Total	**25**

Breakup for Attendance Marks:

S.No	Attendance Range	Marks Awarded
1	95% and Above	5
2	90% - 94%	4
3	85% - 89%	3
4	80% - 84%	2
5	75% - 79%	1

Note:

Special Cases such as NCC, NSS, Sports, Advanced Learner Course, Summer Fellowship and Medical Conditions etc. the attendance exemption may be given by principal and Mark may be awarded.

Break up for Library Marks:

S.No	Attendance Range	Marks Awarded
1	10h and above	5
2	9h- less than 10h	4
3	8h - less than 9h	3
4	7h - less than 8h	2
5	6h - less than 7h	1

Note:
In exception, the utilization of e-resources of library will be considered.

***Components for "Skill Enhancement" may include the following:**

Class Participation, Case Studies Presentation/term paper, Field Study, Field Survey, Group Discussion, Term Paper, Presentation of Papers in Conferences, Industry Visit, Book Review, Journal Review, e-content Creation, Model Preparation, Seminar and assignment.

Components for Skill Enhancement

Any one of the following should be selected by the course coordinator

S.No.	Skill Enhancement	Description
1	Class Participation	• Engagement in class • Listening Skills • Behaviour
2	Case Study Presentation/ Term Paper	• Identification of the problem • Case Analysis • Effective Solution using creativity/imagination
3	Field Study	• Selection of Topic • Demonstration of Topic • Analysis & Conclusion
4	Field Survey	• Chosen Problem • Design and quality of survey • Analysis of survey
5	Group Discussion	• Communication skills • Subject knowledge • Attitude and way of presentation • Confidence • Listening Skill
6	Presentation of Papers in Conferences	• Sponsored • International/National • Presentation • Report Submission
7	Industry Visit	• Chosen Domain • Quality of the work

		• Analysis of the Report • Presentation
8	Book Review	• Content • Interpretation and Inferences of the text • Supporting Details • Presentation
9	Journal Review	• Analytical Thinking • Interpretation and Inferences • Exploring the perception if chosen genre • Presentation
10	e-content Creation	• Logo/ Tagline • Purpose • Content (Writing, designing and posting in Social Media) • Presentation
11	Model Preparation	• Theme/ Topic • Depth of background Knowledge • Creativity • Presentation
12	Seminar	• Knowledge and Content • Organization • Understanding • Presentation
13	Assignment	• Content and Style • Spelling and Grammar • References

ii) Distribution of External Marks (ESE)

Total : 75
Written Exam : 75

Marks Distribution for Practical course

Total : 100
Internal : 40
External : 60

i) Distribution of Internals Marks

S.No.	Particulars	Distribution of Marks
1	Experiments/Exercises	15
2	Test 1	10
3	Test 2	10
4	Observation Notebook	05
	Total	**40**

ii) Distribution of Externals Marks

S.No.	Particulars	External Marks
1	Practical	40
2	Record	10
3	Viva- voce	10
	Total	**60**

Practical examination shall be evaluated jointly by Internal and External Examiners

Mark Distribution for Project/ Internship/ Industrial Training

Total : 100
Internal : 40
External : 60

i) Distribution of Internal Marks

S.No.	Particulars	Internal Marks
1	Review I	15
2	Review II	20
3	Attendance	5
	Total	**40**

ii) Distribution of External Marks

S.No	Particulars	External Marks
1	Project Work /Internship /Industrial training Presentation	40
2	Viva –voce	20
	Total	**60**

Evaluation of Project Work/Internship/ Industrial training shall be shall be done jointly by Internal and External Examiners.

7. Credit Transfer

a. Upon successful completion of **1 NPTEL** Course **(4 Credit Course)** recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one **4 credit course** during the V or VI semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in V orVI semester.

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option – 1 Paper title	4
			Option – 2 Paper title	
			Option – 3 Paper title	

b. Upon successful completion of **2 NPTEL Courses** (2 Credit each) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of **one 4 credit course** during the V or VI semester. Out of 2 NPTEL proposed courses, **atleast 1 course** should cover content/syllabus of exempted core paper in V orVI semester.

Mandatory

The exempted core paper in the V or VI semester should be submitted by the students for approval before the end of 4th semester

Credit transfer will be decided by equivalence committee

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option – 1 Paper title	2
			Option – 2 Paper title	
			Option – 3 Paper title	
2			Option – 1 Paper title	2
			Option – 2 Paper title	
			Option – 3 Paper title	

NPTEL Courses to be carried out during semester I – IV.					
S.No.	Student Name	Class	Proposed NPTEL Course		Proposed Course for Exemption
			Course I	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	Any one Core Paper in **V or VI semester**
			Course II	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	
Class Advisor			**HoD**		**Dean**

8. Innovations

Upon Successful outcome of Design Thinking / Copy right/Product/ Patent by the end of the V Semester, student shall be eligible to get exemption in AECC: Innovation, IPR & Entrepreneurship / Innovation & IPR offered during VI Semester.

9.Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students shall submit the report for evaluation during V semester.

10. Extra Credits: 10

Earning extra credit is not essential for programme completion. Student is entitled to earn extra credit for achievement in Curricular /Co-Curricular/ Extracurricular activities carried out other than the regular class hours.

A student is permitted to earn a maximum of Ten extra Credits during the programme period.

A maximum of 1 credit under each category is permissible.

Category	Credit
Proficiency in foreign language	1
Proficiency in Hindi	1
Self study Course	1
Typewriting/Short hand	1
CA/ICSI/CMA (Foundations)	1
CA/ICSI/CMA(Inter)	1
Sports and Games	1
Publications / Conference Presentations	1

(Oral/Poster)	
Lab on Project	1
Innovation / Incubation / Patent / Sponsored Projects / Consultancy	1
Representation in State / National level celebrations	1
Awards/Recognitions/Fellowships	1

Credit shall be awarded for achievements of the student during **the period of study only**.

GUIDELINES

Proficiency in foreign language

A pass in any foreign language in the examination conducted by an authorized agency.

Proficiency in Hindi

A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha.

Examination passed during the programme period only will be considered for extra credit.

Self study Course

A pass in the self study courses offered by the department.

The candidate should register the self study course offered by the department only in the III semester.

Typewriting/Short hand

A Pass in short hand /typewriting examination conducted by Tamil Nadu Department of Technical Education (TNDTE) and the credit will be awarded.

CA/ICSI/CMA(Foundations)

Qualifying foundation in CA/ICSI/CMA / etc.

CA/ICSI/CMA(Inter)

Qualifying Inter in CA/ICSI/CMA / etc.

Sports and Games

Students can earn extra credit based on their achievements in sports in University/ State / National/ International levels.

Publications / Conference Presentations (Oral/Poster)

Research Publications in Journals
oral/poster presentation in Conference

Lab on Project (LoP)

To promote the undergraduate research among all the students, the LoP is introduced beyond their regular class hours. LoP is introduced as group project consisting of not more than five members. It consist of four stages namely Literature collection, Identification of Research area, Execution of research and Reporting / Publication of research reports/ product developments. These four stages spread over from III to IV semester.

(Evaluation will be done internally)

Innovation / Incubation / Patent / Sponsored Projects / Consultancy

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy

Representation in State/ National level celebrations

State / National level celebrations such as Independence day, Republic day Parade, National Integration camp.

Awards/Recognitions/Fellowships

Regional/ State / National level awards/ Recognitions/Fellowships

GUIDELINES

100 % CIA Courses:

- **AECC**
- **AEEC**

S.No	Type of Course
1	Environmental Studies (AECC)
2	Human Rights and Women's Rights, Basic Tamil / Advanced Tamil (AECC)
3	Innovation &IPR/ Innovation, IPR and Entrepreneurship(AECC)
4	Generic Elective (AEEC)

Modalities for Implementing Internal Assessment Marks:

- Student pertaining to 2023 Batch (2023-26) UG programme for the above mentioned courses shall secure a minimum of 40% out of the maximum

marks in the continuous internal assessment (CIA) i.e., 20 marks out of 50 marks.

- Students who have not acquired the minimum marks shall be allowed to reappear to improve their marks in the exam components only within the time duration of the programme, in the forthcoming semesters.

Distribution of Internal Marks for AECC & AEEC

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45th working day)	15
2	Model (All 5 Units) (On completion of 85th working day)	15
3	Assignment	05
4	Attendance	05
5	Library Usage	05
6	Skill Enhancement *	05
	Total	**50**

Distribution of Internal Marks for Generic Elective (AEEC) (Practical)

S.No.	Particulars	Distribution of Marks
1	CIA -I (1-5 Exercise)	5
2	CIA-II (6-10 Exercise)	5
3	Class Participation	10
4	Practical Record	10
5	Test-III & Viva –Voce(10+10)	20
	Total	**50**

Question paper pattern AECC & AEEC

Test	MARKS	DESCRIPTION	TOTAL	Remarks
CIA Test I **1 Hour First 2.5 Units**	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks
CIA test II/ Model test **1 Hour All five Units**	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks

Question paper pattern		Total Marks - 50	
Basic Tamil		**Advanced Tamil**	
Section -A		**Section -A**	
Choose the correct answer	10x2=20	**Choose the correct answer**	10x1=10
Section -B		**Section -B**	
True or false	10x2=20	**Fill in the blanks**	10x2=20
Section -C		**Section -C**	
Answer in one page	1x10=10	**Write an essay in two pages**	2x10=20

Question paper pattern for all other courses falling under Part I to Part III

CIA I : [1 ½ Hours-2.5 Units] - 25 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section – A	8 x 0.5 = 04 Mark	MCQ	25 Mark	Marks secured will be converted To 5 mark
Section - B	3 x 3 = 09 Mark	Answer ALL Questions Either or Type ALL Questions Carry Equal Marks		
Section - C	2 x 6 = 12 Mark			

CIA II /Model: [3 Hours-5 Units] - 75 Mark

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section – A	10 x 1 = 10 Mark	MCQ	75 Mark	Marks secured will be converted To 5 mark
Section - B	5 x 5 = 25 Mark	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark		
Section - C	5 x 8 = 40 Mark			

End Semester Examination: [3 Hours-5 Units] - 75 Mark

SECTION	MARKS	DESCRIPTION	TOTAL
Section – A	10 x 1 = 10 Mark	MCQ	75 Mark
Section - B	5 x 5 = 25 Mark	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark	
Section - C	5 x 8 = 40 Mark		

Course Code	Course Name	Category	L	T	P	Credit
231TL1A1TA	TAMIL - I	LANGUAGE- I	4	1	-	03

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A1TA	TAMIL - I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I மறுமலர்ச்சிக் கவிதைகள் 13 h

1. இலக்கிய வரலாறு - மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்
2. பாரததேசம் - பாரதியார்
3. படி - பாரதிதாசன்
4. தமிழரின் பெருமை - நாமக்கல் கவிஞர்
5. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை
6. திரைத்தமிழ்

அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத் தொடங்கும் பாடல் - உடுமலை நாராயண கவி

ஆ) 'சும்மா கிடந்த நிலத்தை' எனத் தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்

இ) 'சமரசம் உலாவும் இடமே' எனத் தொடங்கும் பாடல் - மருதகாசி

ஈ) 'உன்னை அறிந்தால்' எனத் தொடங்கும் பாடல் - கண்ணதாசன்

Unit II புதுக்கவிதைகள் 13 h

1. இலக்கிய வரலாறு - புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. கடமையைச் செய் - மீரா
3. மலையாளக் காற்று - சிற்பி
4. ஒப்பிலாத சமுதாயம் - அப்துல் ரகுமான்
5. கன்னிமாடம் - மு.மேத்தா
6. கரிக்கிறது தாய்ப்பால் - ஆரூர் தமிழ்நாடன்
7. ஐந்தாம் வகுப்பு 'அ' பிரிவு - நா. முத்துக்குமார்
8. ஹைகூ கவிதைகள் - 10 கவிதைகள்

Unit III பெண்ணியம் 09 h

1. தொலைந்து போனேன் - தாமரை
2. நீரில் அலையும் முகம் - அ. வெண்ணிலா
3. தற்காத்தல் - பொன்மணி வைரமுத்து
4. ஏனிந்த வித்தியாசங்கள் ? - மல்லிகா
5. புதையுண்ட வாழ்க்கை - சுகந்தி சுப்ரமணியன்

Unit IV சிறுகதைகள் 15 h

1. இலக்கிய வரலாறு - சிறுகதையின் தோற்றமும் வளர்ச்சியும்
2. கனகாம்பரம் - கு.ப.ராஜகோபாலன்
3. ஆற்றங்கரைப் பிள்ளையார் - புதுமைப்பித்தன்
4. பொம்மை - ஜெயகாந்தன்
5. காய்ச்சமரம் - கி. ராஜநாராயணன்
6. காட்டில் ஒருமான் - அம்பை
7. வேட்கை - சூர்யகாந்தன்

Unit V பயிற்சிப் பகுதி 10 h

அ. இலக்கணம்

1. வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கி எழுதுதல்
2. ர,ற-ல,ழ,ள - ண,ந,ன வேறுபாடு - ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல்)

ஆ. படைப்பாக்கம்

1. கவிதை - எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை)
2. சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)

Text Book

1 தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் – 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098.

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம், சென்னை – 600 108.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு - 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை-600 004.

3 இணையதள முகவரி: https://www.tamilvu.org

Dr.N.G.P. Arts and Science College
APPROVED
BOS - 15th 12.06.23 | AC - 15th 14.07.23 | 20th 05.08.23

Course Code	Course Name	Category	L	T	P	Credit
231TL1A1HA	HINDI – I	LANGUAGE - 1	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- The techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3				✓	
CO4	✓		✓		
CO5		✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A1HA	HINDI – I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 13 h

गद्य – नूतन गद्य संग्रह (जय प्रकाश)पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहता पानी निर्मला पाठ 4- राष्ट्रपिता महात्मा गाँधी

Unit II 13 h

कहानी कुंज- डॉ वी.पी. 'अमिताभ'(पाठ 1-4)

Unit III 12 h

व्याकरण : शब्द विचार (संज्ञा, सर्वनाम,विशेषण)

Unit IV 12 h

अनुच्छेद लेखन

Unit V 10 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ 1 to 10)

Text Books

1. प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद-211001
2. प्रकाशक: गोविन्द प्रकाशनसदर बाजार, मथुरा उत्तरप्रदेश-281001
3. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
4. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17

Course Code	Course Name	Category	L	T	P	Credit
231TL1A1MA	MALAYALAM- I	LANGUAGE - I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Apply creative ability	K3
CO5	Build the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2					✓
CO3		✓	✓		
CO4	✓			✓	
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A1MA	MALAYALAM - I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **Novel** 14 h

Pathummayude Adu

Unit II **Novel** 10 h

Pathummayude Adu

Unit III **Short Story** 14 h

Nalinakanthi

Unit IV **Short Story** 10 h

Nalinakanthi

Unit V **Practical Application** 12 h

Expansion of ideas, General Essay and Translation

Text Books

1 Vaikkam Muhammed Basheer, "Pathummayude Adu" (NOVEL), DC Books & Kottayam

2 T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

References

1 Malayala Novel Sahithyam.

2 Malayala Cherukatha Innale Innu.

Course Code	Course Name	Category	L	T	P	Credit
231TL1A1FA	FRENCH - I	LANGUAGE - I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the competence in general communication skills with oral, written and comprehension & expression
- the culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2					✓
CO3					
CO4	✓		✓		✓
CO5	✓		✓		

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A1FA	FRENCH - I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **Salut I Page 10** 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Saluer • Enter en contact • avec quelqu'un. • Se presenter. • S'excuser	En cours de cuisine, premiers contacts avec les members d'un groupe	• Comprendre des personnes qui se saluent. • Ēchanger pour entrer en contact, se présenter, saluer, s'excuser. • Communiquer avec *tu* ou *vous*. • Comprendre les consignes de classe • Ēpeler son nom et son prénom. Computer jusqu'à 10.

Unit II **Enchanté I Page 20** 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Demander de se presenter. • Présenter quelqu'un.	Dans la classe de français, se presenter et remplir une fiche pour le professeur.	• Comprendre les informations essentielles dans un échange en milieu professionnel. • Ēchanger pour se presenter et présenter quelqu'un.

Unit III **J'adore I Page 30** 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Exprimer ses gouts.	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	• Dans une soirée de recontres rapid comprendre des personnes qui échangent sur elles et sur leurs goût • Comprendre une personne qui parler des goûts de quelqu'un d'autre

Unit IV J'adore I Page 30 14 h

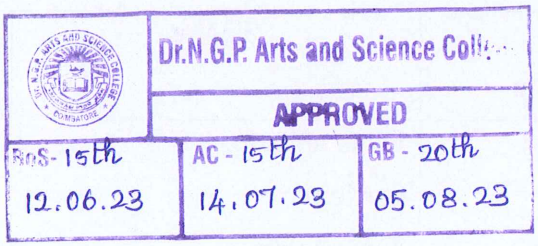
Objectifs de Communication	Tâche	Activités de réception et de production orale
• Présenter quelqu'un	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	• Exprimer ses goûts • Comprendre une demande laissée sur un répondeur téléphonique. • Parler de ses projets de week-end
Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42		
Demander à quelqu'un de faire quelque chose. Demander poliment. Parler d'actions passes. Tu veux bien?	Organiser un programme d'activités pour accueillir une personne importante	Comprendre une personne demande un service à quelqu'un. Demander à quelqu'un de faire quelque chose. Imaginer et raconter au passé à partir de situations dessinées.

Unit V Practical Application 10 h

Make in Own Sentences

Text Book

1 Regine Merieux, Yves Loiseau. 2012. LATITUDES – 1: Méthode de français (Page No: 9-55) Les Editions Dider, Paris, Imprime en Roumanie par Canale en Janvier



Course Code	Course Name	Category	L	T	P	Credit
231EL1A1EA	ENGLISH - I	LANGUAGE- II	4	-	1	3

PREAMBLE

This course has been designed for students to learn and understand

- the effect of dialogue, imagery and varied genres
- any spontaneous spoken discourse and respond to them with proper sentence structure
- the transactional concept of English language

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the various aspects in poetry	K2
CO2	Infer linguistic and non-linguistic features of the context for understanding and interpreting	K3
CO3	Construct sentences and convey messages effectively in real life situations	K3
CO4	Apply different reading strategies with varying speed	K3
CO5	Prepare modules with their own ideas and present them coherently in a grammatically correct form	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	✓
CO2		✓			✓
CO3	✓	✓		✓	
CO4			✓		
CO5	✓	✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231EL1A1EA	ENGLISH- I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I Genre Studies 12 h

Nissim Ezekiel: The Worm- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

Niyi Osundare: Our Earth Will Not Die- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

A. G. Gardiner: On Superstitions- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotation

Nancy Bella: Clever Thief- Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis

H. G. Wells: The Truth about Pyecraft- Author's Biography-narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques

Unit II Listening Skills 12 h

Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening - Comprehensive Listening - Listening to pre-recorded audios on speeches, interviews and conversations - Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)

Unit III Speaking Skills 14 h

Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, Making short presentations- Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech- Giving instructions to do a task and to use a device, Giving and asking directions

Unit IV Reading Skills 10 h

Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill - Word

Power (Denotation and Connotation) - Reading comprehension, Data interpretation -Charts, Graphs, Advertisements

Unit V Writing Skills 12 h

Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review

Text Books

1. Gardiner, A. G. 1926. Alpha of the Plough: Second series, J.M. Dent & Sons Ltd., London, United Kingdom. pg.no-151-156. (Unit I)
2. Ezekiel, Nissim. "The Worm," Crazy Romantic Love, www. mianmawaisarain.live/2020/05/poem-worm-nissim-ezekiel.html. Accessed 3 Aug. 2022. (Unit I)
3. < http://livros01.livrosgratis.com.br/ln000835.pdf /> (Unit I)
4. Mithra, S. M. 1919. Hindu Tales from the Sanskrit, Macmillan & Co Ltd., London, United Kingdom. pg.no-127-142. (Unit I)
5. Nation, I. S. P and Jonathan Newton. 2009. Teaching ESL/EFL Listening and Speaking. Routledge, New York, United States. (Unit II)
6. Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education, Chennai, India. (Unit III– V)

References

1. Our Earth Will Not Die By Niyi Osundare." Studocu.Com, studocu.com /in/document/bangalore-university/bachelor-of-computer-applications /1586771577-our-earth-will-not-die/27675462. Accessed 3 Aug. 2022.
2. OnSuperstitions."THEHISTORIAN,thehistorian1947.wordpress.com/2019/0 3/08/on-superstitions-by-a-g-gardiner. Accessed 3 Aug. 2022.
3. Swales, John M. & Feak, Christine B. 2012. Academic Writing for Graduate Students: Essential Tasks and Skills, University of Michigan Press, Michigan, United States.
4. Rudzka, Brygida -Ostyn, 2003. Word Power: Phrasal Verbs and Compounds: A Cognitive Approach, Mouton de Gruyter, New York, United States.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A1CA	CALCULUS WITH SCILAB	CORE	4	2	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the applications of maxima and minima of functions
- the method of constructing evolutes and envelopes corresponding to a curve
- the influence of various operators on vector functions and its applications

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	identify the maxima and minima of functions	K1
CO2	describe the curvature and evolutes of curves	K2
CO3	recognize the envelope of given surface	K2
CO4	employ various operators on vector functions	K3
CO5	illustrate the applications of vector integration	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A1CA	CALCULUS WITH SCILAB	SEMESTER I

Total Credits: 4

Total Instruction Hours: 72 h

Syllabus

Unit I Maxima , Minima and Points of inflexion 14 h

Maximum and minimum value of a function- necessary conditions for extreme values - sufficient condition - use of second order derivative - application - criteria for concavity upwards - concavity downwards - inflexion at a given point - Computations using Scilab.

Unit II Curvature and Evolutes 14 h

Introduction - definitions - length of arc as a function derivative of arc - radius of curvature - Cartesian equations - Newtonian method - centre of curvature - properties of the evolutes - Computations using Scilab.

Unit III Singular Points and Envelopes 14 h

Introduction - cusps, nodes and conjugate points - definitions - tangents at the origin - conditions for any point (x, y) to be a multiple point - types of cusps - Radii of curvature at multiple points - Envelopes : one parameter family of the curves - determination of envelope – theorem - Computations using Scilab.

Unit IV Divergence and Curl 15 h

Divergence and Curl - Illustrations of curl f and div f - Gradient, Divergence and curl of sums - gradient, divergence and curl of products - second order Differential operator - Laplacian operator- Differential operators in terms of curvilinear co ordinates - differential of length - Computations using Scilab.

Unit V Vector Calculus 15 h

Line integrals - circulation, irrotational vector point functions - surface integrals - flux across a surface: solenoidal vector point functions - volume integrals - reduction of volume to surface integrals - physical interpretation of Gauss' theorem - Computations using Scilab.

Text Books

1 Shanti Narayan, 2003, "Differential Calculus", S Chand and Company Limited, New Delhi

2 Shanti Narayan, Mittal, P.K, 2020, "A text book of Vector Analysis", S Chand and Company Limited, New Delhi

3 Er. Hema Ramachandran and Achuthsankar S Nair (For SciLab experiments), 2015, First edition, "Scilab (A free Software to Matlab)", S. Chand and Company Limited, New Delhi

References

1 S. Narayanan and T.K.M. Pillai, 2008 "Calculus", Vol 1, Viswanathan Publishers, Chennai

2 S. Narayanan and T.K.M. Pillai, 2008 "Calculus", Vol 2, Viswanathan Publishers, Chennai

3 Kanti Kumar Verma and Deepak Kumar , 2015, "The elements of vector calculus, AITBS Publishers, New Delhi

4 For Scilab, https://help.scilab.org/docs/6.0.0/en_US/section_647d3aa8a35d1f0c755bed6b756f36c0.html

Course Code	Course Name	Category	L	T	P	Credit
232MT1A1CB	ANALYTICAL GEOMETRY WITH GEOGEBRA	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the relation between plane and straight line
- the influence of planes in the construction of various forms of a sphere
- the properties of the conicoids

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	describe the equation of plane under given conditions	K1
CO2	identify the shortest distance between two lines and validate the co-planarity of lines	K1
CO3	explain the relation between a sphere and a plane	K2
CO4	recognize the equations of right circular cone and cylinder	K2
CO5	illustrate the geometrical concepts behind conicoid	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2	✓	✓	✓		
CO3	✓	✓	✓	✓	✓
CO4		✓	✓	✓	
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A1CB	ANALYTICAL GEOMETRY WITH GEOGEBRA	SEMESTER I

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I The Plane 12 h

Different forms – a point in relation to a plane – a plane in relation to another plane – bisector of two intersecting planes – locus of a plane - executing simple geometric problems using GEOGEBRA

Unit II The Straight Line 13 h

Different forms – co-planarity of straight lines – distance of a point from a straight line – shortest distance between two straight lines – intersection of three planes - executing simple geometric problems using GEOGEBRA

Unit III The Sphere 11 h

Different forms of a sphere – Points, lines, planes and spheres in relation to a sphere – system of spheres – tangent planes and normal - executing simple geometric problems using GEOGEBRA

Unit IV Conicoids 12 h

The cone – cylinder – ellipsoid – hyperboloid – paraboloid – Surfaces of revolutions - executing simple geometric problems using GEOGEBRA

Unit V Ruled Surfaces 12 h

Tangents and normals – ruled surfaces, generators – diameters, diametral planes and conjugate diameters – sections of conicoids, Umbilics - executing simple geometric problems using GEOGEBRA

Text Books

1 Dipak Chatterjee, 2003, "Analytic Solid Geometry", Prentice Hall of India Private Limited, New Delhi.

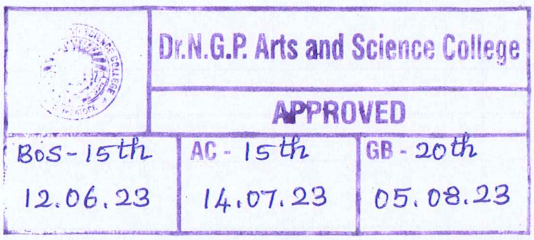
References

1 Abraham Albert, 2016, "Solid Analytic Geometry", Dover Publications, New York.

2 Durai Pandian, Laxmi Durai Pandian and Mukilan, 2003, "Analytical Geometry 3D", S.Chand and company Pvt. Ltd., New Delhi.

3 Geogebra Manual – The Offical Manual of Geogebera Research.shu.ac.uk/geogebra/GIF – Guides/official Geogebra manual.pdf(2011).

4 Manicavachagom Pillay T.K. and Natarajan T. 2011, Analytical Geometry (Three Dimensions), S. Viswanathan Publishers, Chennai..



Course Code	Course Name	Category	L	T	P	Credit
232PY1A1IP	PHYSICS - I	IDC	3	-	4	5

PREAMBLE

This course has been designed for students to learn and understand

- The properties of electricity, crystals, and electronics
- The thermal, and optical properties of the materials.
- The basics of digital electronics

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Explain the applications of electrical circuits	K2
CO2	Classify different types of bonds, bond theory and energy gaps	K2
CO3	Develop the different kinds of spectral formation	K3
CO4	Demonstrate the working of diodes and rectifiers	K3
CO5	Experiment with the logic gates	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1				✓	
CO2				✓	
CO3	✓	✓	✓	✓	✓
CO4	✓			✓	
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	-	Entrepreneurial Development
✓	Employability	✓	Innovations
-	Intellectual Property Rights	-	Gender Sensitization
-	Social Awareness/ Environment	-	Constitutional Rights/ Human Values/ Ethics

232PY1A1IP	PHYSICS - I	SEMESTER I

Total Credits: 5

Total Instruction Hours: 72 h

Syllabus

Unit I Electricity 16 h

Capacitors – Types of capacitors - Spherical capacitor - Cylindrical capacitor - Carey-Foster's bridge – Working of potentiometer - Calibration of voltmeter - Calibration of ammeter

1.Calibration of low range voltmeter using potentiometer

2. Determination of unknown resistance using Carey Foster's bridge

3. Calibration of low range ammeter using potentiometer

Unit II Crystals 13 h

Ionic crystals - Covalent crystals - Metallic bond - Band theory of solids - Tunnel diodes - Energy bands - Superconductivity - Bound electron pairs - Hall effect - Experimental determination of hall coefficient.

4.Determination of band gap of semiconductors using four probe method

5.Determination of band gap of semiconductor by thermal method

Unit III Optics 17 h

Interference in the thin film - Air wedge – Thickness of a thin wire – Newton's rings – Determination of wavelength using Newton's rings - Theory of transmission grating – Normal incidence

6.Determination of wavelength of mercury lines by grating minimum deviation method

7.Determination of the radius of curvature in Newton's rings

Unit IV Analog Electronics 13 h

Bridge rectifiers – Band gap determination using post office box – Transistor characteristics in common base and common emitter mode - Transistor single stage amplifier- Expression for input impedance - Output impedance and current gain

8.Characterization of junction diode

9.To determine band gap using Post office box method

Unit V Digital Electronics 13 h

1's and 2's complement of a binary number and binary arithmetic - Steps in the fabrication of Monolithic IC's – General applications of IC's - Registers - Flip flops - JK flip flops - Half adder - Full adder

10.Verification of logic gate truth table.

11.Verification of De Morgan's law.

12.Construction and working of IC regulated power supply

Text Books

1 Murugesan R., 2016, "Modern Physics", 18th Edition, S.Chand and Co, New Delhi.

2 E-book]Arthur B, 2003, "Concepts of Modern Physics", 6th Edition, McGraw-Hill, New York.

References

1 Sedha R.S., 2004, "A text book of Digital Electronics", 1st Edition. S. Chand & Co, New Delhi.

2 David H, Robert R, Jearl W, 2014, "Fundamentals of Physics", 10th Edition. John Willy Company Hoboken, New Jersey, United States.

3 [E-book] Serway A.R., Jewett W.J.,2014, "Physics for Scientists and Engineers with Modern Physics",9th Edition,Brooks/Cole, USA.

4 Gupta Kumar, 2011, Solid State Physics, K Nath and co Meerut.

5 Brijal N and Subramanian, "Text book of optics" ,S.Chand& Company, New Delhi

6 Weblink: https://www.askiitians.com/revision-notes/physics/solid-and-electronic-device/

Course Code	Course Name	Category	L	T	P	Credit
233MB1A1AA	ENVIRONMENTAL STUDIES	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- Multi disciplinary aspects of Environmental studies
- Importance to conserve the Biodiversity
- Causes of Pollution and its control

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of natural resources in order to conserve for the future.	K2
CO2	Infer on Natural resources and its conservation	K2
CO3	Apply the knowledge on Biodiversity and its conservation	K3
CO4	Relate effects, causes and control of air, water, soil and noise pollution etc.,	K2
CO5	Build awareness about sustainable development and Environmental protection	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		
CO2	✓		✓		
CO3	✓		✓		
CO4	✓		✓		
CO5	✓		✓		

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

233MB1A1AA	ENVIRONMENTAL STUDIES	SEMESTER I

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Environmental studies & Ecosystems 5 h

Introduction to Environmental studies& Ecosystems: Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

Unit II Natural Resources: Renewable and Non-renewable Resources 5 h

Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and overexploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.

Unit III Biodiversity and Conservation 5 h

Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit IV Environmental Pollution, Environmental Policies & Practices 5 h

Environmental Pollution, Environmental Policies & Practices: Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. Wildlife Protection Act; Forest Conservation Act;

Unit V Human Communities and the Environment& Field Work 4 h

Human Communities and the Environment& Field Work: Human population and growth: Impacts on environment, human health and welfares. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness. Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Population explosion – Family Welfare Programmes. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.

Text Books

1 Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2 Gadgil, M., &Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

References

1 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge

2 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press

3 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006

4 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

5 McCully, P.1996. Rivers no more: the environmental effects of dams(pp. 29-64). Zed Books

6 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century

7 Odum, E.P., Odum, h.T. & Andrews, J.1971. Fundamentals of Ecology. Philadelphia: Saunders.

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Dr.NGPASC
COIMBATORE | INDIA

Course Code	Course Name	Category	L	T	P	Credit
231TL1A2TA	TAMIL- II	LANGUAGE- I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம்,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills) மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு (Tamil knowledge)	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2	✓			✓	
CO3	✓	✓			
CO4	✓		✓		
CO5	✓			✓	

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A2TA	TAMIL- II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I அற இலக்கியம் 13 h

1. இலக்கிய வரலாறு- பதினெண்கீழ்க்கணக்குநூல்கள்

2.திருக்குறள்

அ. அறன்வலியுறுத்தல்- அ. எண் 04

ஆ. நட்பாராய்தல் - அ. எண் 80

இ. நாடு- அ. எண் 74

ஈ. குறிப்பறிதல்- அ. எண் 110

Unit II அற இலக்கியம் 13 h

1. நாலடியார் - அறிவுடைமை
2. மூதுரை - ஔவையார் - 10 பாடல்கள் 6, 7, 9, 10, 14, 16, 17, 23, 26, 30
3. இனியவைநாற்பது- பூதஞ்சேந்தனார் - முதல் 10 பாடல்கள்

Unit III அறநெறிக் கட்டுரைகள் 09 h

1. இலக்கியவரலாறு - தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

2. கலைகள்-உ.வே.சா

3. சங்க நெறிகள்- வ.சுப.மாணிக்கம்

Unit IV அறநெறிக் கட்டுரைகள் 15 h

1. வீர வணக்கம் - க.கைலாசபதி
2. தமிழர் பண்பாடு - டாக்டர் சோ.நா.கந்தசாமி
3. இணையத் தமிழ் வளர்ச்சி - முனைவர் ப.அர.நக்கீரன்

Unit V பயிற்சிப் பகுதி 10 h

1.இலக்கணம்-வழு, வழுவமைதி,வழாநிலை

2.அலுவலகம் சார்ந்த கடிதம் -விண்ணப்பங்கள், வேண்டுகோள்,முறையீடு

3.படைப்பாக்கம்-பொதுத்தலைப்பில் கட்டுரைகள் எழுதுதல்

Text Book

1. தமிழ் மொழிப்பாடம்-2023-2024,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to V)

References

1. பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு. 2014. தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.
2. பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு. 2013. இலக்கணம்-இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை. .
3. தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி: https://www.tamilvu.org

Course Code	Course Name	Category	L	T	P	Credit
231TL1A2HA	HINDI - II	LANGUAGE- I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓	✓			✓
CO3	✓		✓	✓	✓
CO4	✓		✓		✓
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A2HA	HINDI - II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 13 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

Unit II 13 h

उपन्यास: सेवासदन-प्रेमचन्द

Unit III 12 h

कहानी-किरीट- डा उषा पाठक / डा अचला पाण्डेय

पाठ 1.कफ़न, 3. चीफ़ की दावत

Unit IV 12 h

पत्र लेखन: (औपचारिक या अनौपचारिक)

Unit V 10 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में) (पाठ 1 to 10)

Text Books

1 प्रकाशक: लोकभारती प्रकाशन पहली मंजिल, दरबारी बिल्डिंग,महात्मा गाँधी मार्ग, इलाहाबाद. (Unit I)

2 प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद. (Unit II)

3 प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली. (Unit III)

4 पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद. (Unit IV)

5 प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई. (Unit V)

Course Code	Course Name	Category	L	T	P	Credit
231TL1A2MA	MALAYALAM- II	LANGUAGE - I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓				✓
CO3	✓	✓	✓		✓
CO4	✓		✓	✓	✓
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A2MA	MALAYALAM- II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **Novel** 12 h

Enmakaje: Chapter1- Chapter5

Unit II **Novel** 10 h

Enmakaje: Chapter 6- Chapter 10

Unit III **Novel** 12 h

Enmakaje: Chapter 11- Chapter 15

Unit IV **Autobiography** 14 h

NeermathalamPoothaKalam: Chapter 1- Chapter 10

Unit V **Autobiography** 12 h

NeermathalamPootha Kalam: Chapter 11- Chapter 20

Text Books

1. Ambika SuthanMangad, Enmakaje (Novel), DC Books Kottayam, Kerala, India. (Unit I to III)
2. Madhavikkutty, NeermathalamPootha Kalam (Autobiography), DC Books Kottayam, Kerala, India. (Unit IV & V)

References

1. MalayalaNovelSahithyam, DC Books Kottayam, Kerala, India.
2. MalayalaSahithyaCharithram, National Books Kottayam, Kerala, India.

Course Code	Course Name	Category	L	T	P	Credit
231TL1A2FA	FRENCH- II	LANGUAGE - I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓			✓
CO3			✓	✓	✓
CO4	✓		✓		✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A2FA	FRENCH- II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 12 h

Proposer, accepter, refuserune invitation. Indiquer la date.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendreunemessage d'invitationsurunrépondeu rtéléphonique. Inviter quelqu'un accepter ourefuserl'invitation.

Unit II 12 h

Prendreet fixer un rendez-vous. Demander etindiquerl'heure.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendre des personnes qui fixentunrendez-vous par téléphonique. Prendreun rendez-vous par telephone

Unit III 12 h

Exprimer son point de vue positif et négatif. S'informersur le prix. S'informersur la quantitité. Exprimer la quantitité.	En groupes, choisir un cadeau pour un ami.	Exprimer son point de vuesur des idées de cadeau. Faire des achatsdans un magasin

Unit IV 14 h

Demander etindiquerune direction. Localiser (près de, en face de ….). Exprimerl'obligationl' Interdit.Conseiller.	Suivre un itinéraire à l'aided'indications par telephone et d'un plan. Par courrierélectronique, donner des informations et des conseils à un ami qui veut voyager.	Comprendre des indications de direction. Comprendre des indications de lieu. Comprendreune chanson. Comprendre de courts messages qui experiment l'obligationoul'interdiction. Donner des conseils à des personnesdans des situations données.

Unit V 10 h

Make in Own Sentences

Text Book

1. Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 56-101) (Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar), New Delhi-7 Les Editions Dider, Paris, 2008- Imprime en Roumanie par Canale en Janvier 2012. (Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
231EL1A2EA	ENGLISH- II	LANGUAGE- II	4	-	1	3

PREAMBLE

This course has been designed for students to learn and understand

- the language for specific purposes through various literary manuscripts
- the process of communicative competencies in academics through authentic contexts
- the different formats of business correspondence with lucidity and accuracy via various media

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify and appreciate the eminent writers' works of various genres	K1
CO2	Infer and comprehend complex situational talks	K2
CO3	Relate formal and informal communicative contexts to speak fluently	K2
CO4	Construct the denotative and connotative meanings while reading specialized texts	K3
CO5	Develop the skill of writing through descriptions, narrations and essays	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	
CO2		✓			✓
CO3		✓			✓
CO4	✓	✓	✓		✓
CO5			✓		✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231EL1A2EA	ENGLISH- II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I Genre Studies 15 h

John Keats: To a Friend Who Sent Me Some Roses - Author's Note - title indications- outline-paraphrasing the poem- context of poem- form- poetic devices- techniques- Style

A. G. Gardiner: On Habits - Author's Note- Title indications- Outline -Passage Analysis - context of the Prose - Narrative techniques- Style

Sudha Murthy: The Enchanted Scorpions- Author's Note - title indications-Plot summary- Outline of the story -devices- Narrative techniques- Style

David Pinski: A Dollar- Author's Note- Title indications -Plot Summary- Critical Analysis-Themes- Character analysis - Terms- Symbols

Unit II Listening Skills 10 h

Listening to Talks/Lectures by Specialists on selected subject-specific topics-Listening to Public Announcements- Listening to Instructions and Directions-Listening to Speeches- Listening to process/event descriptions to identify causes & effects

Unit III Speaking Skills 11 h

Small Talk- Mini Presentations and Making Recommendations- Group Discussions, Debates, and Expressing opinions through Role play- Picture Description-Giving Instruction to Use a Product- Presenting a Product- Summarizing a Lecture-Narrating Personal Experiences/ Events- Interviewing a Celebrity- Scientific Lectures- Educational Videos- Debates- Different Viewpoints on an Issue

Unit IV Reading Skills 12 h

Reading Biographies, Newspaper Reports, Technical Blogs- ReadingAdvertisements - Gadget Reviews- Newspaper Articles - Journal Reports – Reading Editorials & Blogs- Case Studies- Excerpts from Literary Texts

Unit V Writing Skills 12 h

Inferring & Interpreting- Predicting Reorganizing Material- Summary Writing Based on the Reading Passages- Writing - Emails & Essay Writing (Descriptive or Narrative)- Grammar - Tenses- Question Types: Wh/ Yes or No/ and Tags

Text Books

1. Keats, John. To a Friend Who Sent Me Some Roses. <https://www.Poets.org , 1820, poets.org/poem/ friend-who-sent-me-some-roses.html/> (Unit I)
2. Gardiner, Alfred George. On Habits (n.d.). <Https://Www. Gutenberg. Org/ Files/47429/47429-H/47429-H.Html/> (Unit I)
3. Murthy, Sudha. The Enchanted Scorpions. (n.d.). <https://www. ssgopalganj.in/online/EBooks/CLASS%20VI/Grandma's%20Bag%20of%20 Stories%20by%20Sudha%20Murthy.pdf/> pp-34-39. (Unit I)
4. Pinski, David. A Dollar - a One-act Play.<www.one-act-plays.com/ comedies/dollar.html/> (Unit I)
5. Hart, Steve, Aravind R. Nair, Veena Bhambhani. 2016. Embark: English for Undergraduates. Cambridge University Press, New Delhi, India. (Unit II)
6. Lakshminarayan. 2012. A Course Book On Technical English. Scitech Publications Pvt. Ltd., New Delhi, India. (Unit III)
7. Raman, Meenakshi & Sangeeta Sharma. 2016. Technical Communication-Principles And Practice, Oxford University Press, New Delhi, India. (Unit IV)
8. Viswamohan, Aysha. 2017. English For Technical Communication (With CD), McGraw Hill (India) Private Limited, New Delhi, India. (Unit V)

References

1. Bajwa and Kaushik. 2010. Springboard to Success- Workbook for Developing English and Employability Skills. Orient Black Swan, Chennai, India.
2. Chellammal, V. 2003. Learning to Communicate. Allied Publishing House, New Delhi, India
3. Krishnaswamy. N, LalithaKrishnaswamy& B.S. Valke. 2015. Eco English, Learning English through Environment Issues. An Integrated, Interactive Anthology. Bloomsbury Publications, New Delhi, India.
4. Syamala. V. 2002. Effective English Communication for You. Emerald Publishers, Chennai, Tamil Nadu, India.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A2CA	DIFFERENTIAL EQUATIONS	CORE	4	2	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the method of solving linear differential equations with constant coefficients
- the application of differential equations
- the solvability of linear and non-linear partial differential equations of order one

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	find the Particular integral of linear differential equations	K2
CO2	solve second order differential equations	K3
CO3	apply the differential equations in physical problems	K4
CO4	solve linear partial differential equations of order one	K2
CO5	solve non-linear partial differential equations of order one	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A2CA	DIFFERENTIAL EQUATIONS	SEMESTER II

Total Credits: 4

Total Instruction Hours: 72 h

Syllabus

Unit I Linear differential equations with constant coefficients 16 h

Linear differential equations with constant coefficients- determination of complementary function- working rule- symbolic function 1/f(D)- general method of getting P.I- working rule for finding P.I- methods of finding P.I- X=e^{ax}, sin ax, cos ax, x^m, $e^{ax}.V$, xV.

Unit II Linear differential equations of second order 12 h

General form-complete solution of y''+Py'+Qy=R - rule for getting an integral belonging to C.F - working rule - reduction to normal form- transformation of the equation by changing the independent variable- method of variation of parameters- solutions by operators.

Unit III Applications of differential equations 14 h

Introduction- mixture problems - Newton's second law and Hooke's law- differential equation of the vibrations of a mass on a spring- Free, undamped motion- Free, damped motion- forced motion- resonance phenomena- electric circuit problems - Applications to mechanics.

Unit IV Linear partial differential equations of order one 14 h

Origin of PDE - derivation of PDE by the elimination of arbitrary constant and function - Cauchy problem - Lagrange's equation- Lagrange's method of solving Pp+Qq=R - Type 1 based on rule I- type 2 based on rule II- type 3 based on rule III- type 4 based on rule IV- miscellaneous examples.

Unit V Non-linear partial differential equations of order one 16 h

Complete integral- particular integral- singular and general integral- geometrical interpretation- method of getting singular integral- compatible system of first order equations- Charpit's method- methods of solutions to certain standard forms- standard forms I, II, III and IV.

Text Books

1 Raisinghania M. D, 2012, "Ordinary and Partial Differential Equations", Fourteenth Edition, S. Chand & Company Limited, New Delhi.

References

1 Narayanan S and Manicavachagam Pillay T.K, 2014, "Differential Equations and its Applications", S. Viswanathan Printers and Publishers Pvt Ltd, Chennai.

2 Bali N.P, 2004, "Differential Equations", Laxmi Publications Limited, New Delhi.

3 Zafar Ahsan, 2016, "Differential Equations and their Applications", PHI Learning Private Limited, New Delhi.

4 Kandasamy P and Thilagavathi K, 2004, "Mathematics for B.Sc. Branch-I" Volume III, S. Chand and Company Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A2CB	FOURIER SERIES AND INTEGRAL TRANSFORMS	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the behavior of Fourier series
- the different types of integral transforms
- the method of solving boundary value problem using Integral transforms

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	describe the given function in the form of Fourier series	K2
CO2	identify the Fourier transform of a function	K1
CO3	illustrate the application of Inverse Fourier transform	K3
CO4	explain the properties of Laplace transform	K2
CO5	apply the concept of Inverse Laplace transform to solve differential equations	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A2CB	FOURIER SERIES AND INTEGRAL TRANSFORMS	SEMESTER II

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Fourier series 13 h

The Fourier coefficients-the problem of convergence-even and odd functions. Cosine and sine series-extension to arbitrary intervals.

Unit II Fourier Transform 12 h

Fourier transforms- Fourier sine and cosine transforms- linearity property - change of scale property- Modulation theorem- evaluation by inversion theorems- Fourier transform of some particular functions- convolution of functions- convolution theorem - Parseval's relations.

Unit III Applications of Fourier Transform 10 h

Fourier transforms of rational functions- examples - solution of integral equations of convolution type- Fourier transform of functions of several variables- application of Fourier transform to boundary value problems.

Unit IV Laplace Transform 12 h

Definitions- Sufficient conditions - linearity property - Laplace transforms of some elementary functions- first and second shift theorem- change of scale property- examples- Laplace transform of derivatives and integrals- Laplace transform of t^n f(t), f(t)/t , periodic function and special functions- initial and final value theorems- examples - convolution.

Unit V Inverse Laplace Transform and applications 13 h

Introduction- calculation of Laplace inversion of some elementary functions- method of partial fractions of the ratio of two polynomials -general evaluation technique of inverse Laplace transform- application of Laplace transform.

Text Books

1. George F.Simmons, 2019, "Differential Equations with Applications and Historical Notes", Mc Graw Hill Education (India) Pvt. Ltd., New Delhi.
2. Baidyanath Patra, 2018, "An Introduction to Integral Transforms", first edition, CRC Press,London.

References

1. Lokenath Debnath and Dambaru Bhatta, 2014," Integral Transforms and their applications", third edition, CRC Press, London.
2. Parmanand Gupta, 2019, "Topics in Laplace and Fourier Transforms", First edition, Laxmi Publications Pvt. Ltd., New Delhi.
3. Veerarajan T, 2022," Fourier Series and Integral Transforms ", Yes Dee Publishing Pvt. Ltd., Chennai.
4. Ray Hanna J and John H.Rowland, 1990, "Fourier Seires, Transforms and Boundary Value Problems", Second edition, John wiley & Sons, Inc, New York.

Course Code	Course Name	Category	L	T	P	Credit
232PY1A2EP	PHYSICS -II	IDC	3	-	4	5

PREAMBLE

This course has been designed for students to learn and understand

- The basic principles, theory and concepts of properties of matter.
- The concepts of viscosity and surface tension.
- The basic programming in microprocessor.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Explain the importance and applications of young's modulus.	K2
CO2	Demonstrate the viscosity for a given liquid.	K2
CO3	Explain the basic of surface tension and vibration of wave.	K3
CO4	Illustrate the gravitational field and applications.	K3
CO5	Write the assembly language programs	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓	✓	
CO2	✓	✓			✓
CO3	✓	✓	✓	✓	
CO4	✓	✓		✓	
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232PY1A2EP	PHYSICS -II	SEMESTER II

Total Credits: 5

Total Instruction Hours: 72 h

Syllabus
(Embedded)

Unit I Properties of matter 14 h

Young's Modulus – Rigidity Modulus – Poisson's Ratio – Bending of Beams – Expression for Bending Moment – Measurement of Young's Modulus – Uniform and Non-Uniform Bending.

Practical

1. Determine the Young's modulus of a given bar – Uniform bending (Microscopic method).
2. Determine the Young's modulus of given bar – Non-Uniform bending (Microscopic method).
3. Determination of rigidity modulus of a string by using static method.

Unit II Viscosity 13 h

Poiseuille's formula for the flow of a liquid through capillary tube – Ostwald's viscometer – Stokes method for coefficient of viscosity of a viscous liquid – Friction and lubrication.

Practical

4. Determine the coefficient of viscosity of water by Poiseuille's Method.
5. Determine the coefficient of viscosity of water by Stoke's Method.

Unit III Surface Tension and Vibration 15 h

Explanation of surface tension on kinetic theory – Work done in increasing area of a surface – Pressure difference across a liquid surface - Jaegar's method - Transverse and longitudinal modes of vibration - A.C. frequency measurement using sonometer.

Practical

6. Determine the surface tension of water by drop weight method.
7. Study the frequency of a tuning fork by sonometer.

Unit IV Gravitation 14 h

Newton's law of gravitation - Kepler's laws of planetary motion - Determination of 'G' Boy's experiment - Variation of 'g' with altitude and depth - Determination of 'g' with compound pendulum.

Practical

8 Compound Pendulum - Determination of 'g'.

9 Torsional pendulum - Determination of moment of inertia of given disc.

Unit V Microprocessors 8085 instruction set 16 h

8085 Machine language - 8085 assembly language - ASCII codes - Writing and executing an assembly language program - High level language - Operating system.

Practical

10. Write the assembly language program for 8-bit subtraction.
11. Write the assembly language program for 8-bit addition.
12. Write the assembly language program for 8-bit Multiplication.

Text Books

1. Murugesan R., 2016, "Modern Physics", 18th Edition, S. Chand and Co, New Delhi.
2. Ramesh S. Gaonkar, 2013, Microprocessor architecture, Programming and application with 8085, 6th edition, New age international.

References

1. Brij Lal and Subrahmanyam N, 2017,"Properties of Matter", 7th Edition, S. Chand and Co, New Delhi.
2. Subramanyam N, 2019,"Text book of Sound", 3rd Edition, Vikas publications, New Delhi.
3. Nagoor Kani A, 2012, "Microprocessors and Microcontrollers", 2nd Edition, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. E-book: Godse A.P, Godse D.A, 2008, "Microprocessors and Microcontroller System" Technical Publications, Pune.
5. Weblink: https://https://archive.nptel.ac.in/courses/108/105/108105102/

231TL1A2AA	PART- IV: BASIC TAMIL	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2023–24ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது
(10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

(பருவத் தேர்வு இல்லை)

Syllabus

Unit I தமிழ் மொழியின் அடிப்படைக் கூறுகள் 05 h

எழுத்துகள் அறிமுகம்

1. உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்
2. மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்
3. உயிர்மெய் எழுத்துக்கள்
4. பயிற்சி

Unit II சொற்களின் அறிமுகம் 05 h

1.பெயர்ச்சொல்

2.வினைச்சொல் – விளக்கம் (எ.கா.)

3.பயிற்சி

Unit III குறிப்பு எழுதுதல் 05 h

1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி

2. தமிழ் மாதங்கள்(12), வாரநாட்கள்(7)

3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்

Unit IV குறிப்பு எழுதுதல் 05 h

1. ஊர்வன, பறப்பன, விலங்குகள்

2.மனிதர்களின் உறவுப்பெயர்கள்

3. ஊர்களின்பெயர்கள் (எண்ணிக்கை 10)

Unit V பயிற்சிப் பகுதி 04 h

பயிற்சிப் பகுதி (உரையாடும் இடங்கள்)

வகுப்பறை, பேருந்து நிலையம், சந்தை– பேசுதல்,எழுதுதல்.

Notes:

அகமதிப்பீட்டுத்தேர்வு – வினாத்தாள் அமைப்புமுறை- மொத்த மதிப்பெண்கள் - 50

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி –ஆ

சரியா? தவறா? 10x2=20

பகுதி – இ

ஒரு பக்க அளவில் விடையளிக்க 1x10=10

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ–க்கான வினாக்கள் இதுஅல்லது அதுஎன்ற அடிப்படையில் அமைதல் வேண்டும்

Text Book

1 அடிப்படைத் தமிழ் - 2023-2024,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர்.வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to IV)

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம், சென்னை.

2 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY வலைதள முகவரி: <https://www.tamilvu.org/>

231TL1A2AB	PART- IV: ADVANCED TAMIL	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2023– 2024 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது
(10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)
(பருவத் தேர்வு இல்லை)

Syllabus

Unit I கவிதைகள் 06 h

1. தமிழ்நாடு - பாரதியார்
2.மனதில் உறுதி வேண்டும் - பாரதியார்
3. இன்பத்தமிழ் - பாரதிதாசன்
4.வேலைகளல்லவேள்விகள் - தாராபாரதி
5.தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
6. நட்புக் காலம்(10 கவிதைகள்)- அறிவுமதி கவிதைகள்

Unit II கட்டுரை 05 h

கட்டுரைத் தொகுப்பு -நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

Unit III இலக்கணம் 04 h

1.வல்லினம் மிகும் மற்றும் மிகா இடங்கள்

2. ர,ற,ல,ழ,ள,ந,ண,ன – வேறுபாடு அறிதல்

Unit IV கடிதங்கள் 05 h

1. பாராட்டுக் கடிதம்
2. நன்றிக் கடிதம்
3. அழைப்புக் கடிதம்
4. அலுவலக விண்ணப்பங்கள்

Unit V பயிற்சிப் பகுதி 04 h

படைப்பாக்கப் பகுதி

பொதுத் தலைப்புகளில் கவிதை,கட்டுரை எழுதச்செய்தல்

Notes

அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை- மொத்த மதிப்பெண்கள் - 50

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x1=10

பகுதி –ஆ

கோடிட்ட இடங்களை நிரப்புக. 10x2=20

பகுதி –இ

இரண்டு பக்க அளவில் விடையளிக்க 2x10=20

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ–க்கான வினாக்கள் இதுஅல்லது அதுஎன்ற அடிப்படையில் அமைதல் வேண்டும்

Text Book

1 சிறப்புத் தமிழ் - 2023-2024, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit- I to IV)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு. 2014. தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம்,சென்னை.

2 டாக்டர் மு.வரதராசன். 2010. நல்வாழ்வு, பாரி நிலையம், சென்னை.

3 பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு.2013. இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன்- பூவேந்தன் பதிப்பகம், சென்னை..

4 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : <https://www.tamilvu.org/>

Course Code	Course Name	Category	L	T	P	Credit
235CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- Concepts of Human Rights.
- Human Right Violations and Redressal Mechanism.
- Rights to Women and Child.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Human Rights.	K1
CO2	Describe the Fundamental Rights.	K2
CO3	Relate Human Right Violations and Redressal Mechanism.	K3
CO4	State the Rights to Women and Child.	K2
CO5	Apply Civil and Political Rights of Women.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓		✓	✓
CO2		✓	✓	✓	✓
CO3				✓	✓
CO4		✓		✓	✓
CO5	✓	✓	✓	✓	✓

COURSES FOCUSES ON

	Skill Development		Entrepreneurial Development
	Employability		Innovations
	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

235CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Human Rights 04 h

Meaning - Definition - Nature - Content - Legitimacy of Human Rights - Origin and Development of Human Rights - Theories - Principles of Magna Carta - Modern Movements of Human Rights - The Future of Human Rights. Case studies related to human rights.

Unit II Human Rights in India 05 h

The Constitution of India: Fundamental Rights - Right to Life and Liberty - Directive Principles of State Policy - Fundamental Duties - Individual and Group Rights - Other facets of Human Rights - Measures for Protection of Human Rights in India.

Unit III Human Right Violations and Redressal Mechanism 05 h

Human Rights: Infringement of Human Right by State Machinery and by Individual - Remedies for State action and inaction - Constitutional Remedies - Public Interest Litigation (PIL) - Protection of Human Rights Act, 1993 - National Human Rights Commission - State Human Rights Commissions - Constitution of Human Right Courts.

Unit IV Rights to Women and Child 05 h

Matrimonial protection - Protection against dowry - Protection to pregnancy - Sexual offences - Law relating to work Place - Directive principles of Constitution (Article 39 a, d, e & Article 42, 43 & 46) - Trafficking of women - Constitutional Rights - Personal Laws - Protection of children against Sexual Offences Act, 2012 (POCSO). Case studies related to Sexual offences.

Unit V Civil and Political Rights of Women 05 h

Right of Inheritance - Right to live with decency and dignity - The Married women's Property Act, 1874 - Women's right to property - Women Reservation Bill - National Commission for Women - Political participation - Pre-independent political participation of women - Participation of Women in post independent period. Kavalan App. Case studies related to women rights.

Text Books

1 LalitParmar, 1998, "Human Rights", Anmol Publications Pvt. Limited, New Delhi.

2 Krishna Pal Malik, 2009, "Women & Law", Allahabad Law University, New Delhi.

References

1 Mandagadde Rama Jois, 2015, "Human Rights", Bharatiya Values, BharatiyaVidya Bhavan Publications, Mumbai.

2 Paras Diwan and PiyushDiwan, 1994, "Women and Legal Protection", South Asia Books, Andhra Pradesh.

3 VenkataramandSandhiya. N, 2001, "Research in Value Education", APH Publishing Corporation, New Delhi.

4 Anand A S, 2008, "Justice for Women: Concerns and Expressions", Universal Law Publishing Co., New Delhi.

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Course Code	Course Name	Category	L	T	P	Credit
231TL1A3TA	TAMIL- III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம்,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு(Tamil knowledge)	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2				✓	
CO3		✓			
CO4	✓		✓		
CO5	✓			✓	

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A3TA	TAMIL- III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **காப்பியங்கள்** 10 h

1.சிலப்பதிகாரம் -வழக்குரை காதை
2. மணிமேகலை-ஆதிரை பிச்சையிட்ட காதை

Unit II **காப்பியங்கள்** 10 h

1. கம்பராமாயணம் -கும்பகர்ணன் வதைப்படலம்: பா. எண் : 60 முதல் – 100 வரை
2. பெரிய புராணம் - அதிபத்த நாயனார்புராணம்

Unit III **சிற்றிலக்கியங்கள்** 10 h

1.திருக்குற்றாலக்குறவஞ்சி - வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4கண்ணிகள்)

2.கலிங்கத்துப்பரணி-களம்பாடியது: போர்க்களக் காட்சி- பா.எண்: 472 முதல்- 502 வரை

Unit IV **இலக்கிய வரலாறு** 10 h

1.காப்பியம் – வரையறை,ஐம்பெருங் காப்பியங்கள்,ஐஞ்சிறு காப்பியங்கள்
2.கம்பராமாயணம், பெரிய புராணம் – குறிப்பு
3. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்

Unit V **இலக்கணம் &பயிற்சிப் பகுதி** 08 h

அ. இலக்கணம்

1.'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம் மட்டும்.

2. அணி: உவமையணி, உருவக அணி, இல்பொருள் உவமையணி விளக்கம், உதாரணம்.

ஆ. பயிற்சிப் பகுதி

1.வாசகர் கடிதம்: நாளிதழ், வானொலி, செய்தி ஊடகங்களுக்கு விமர்சனம் எழுதுதல்
2.திரைக்கதை விமர்சனம்: மத்திய மற்றும் மாநில அரசு விருது பெற்ற தமிழ்த் திரைப்படங்கள் மட்டும்

Text Book

1 தமிழ் மொழிப்பாடம்-2023 -2024 ,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to V)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு-2014,தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு- 2013,இலக்கணம்-இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை. .

3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி: https://www.tamilvu.org

Course Code	Course Name	Category	L	T	P	Credit
231TL1A3HA	HINDI- III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3	✓		✓	✓	
CO4					✓
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A3HA	HINDI- III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

पद्य – काव्य पराशर (भोलानाथ)

(प्राचीन- कबीर, तुलसी, सुर, मीरा, आधुनिक- मैथिलीशरण गुप्त, अरूण कमल)

Unit II 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

Unit III 10 h

अलंकार:अनुप्रास,यमक, श्लेष, वक्रोक्ति, उपमा,रूपक

Unit IV 10 h

संवादलेखन

Unit V 08 h

अनुवादअभ्यास-III (केवलहिन्दीसेअंग्रेजीमें)

(पाठ10 to 20)

Text Books

1. प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुराउत्तर प्रदेश-281001(Unit I)
2. आचार्य रामचन्द्र शुक्ललोकभारती प्रकाशन इलाहाबाद. (Unit II)
3. प्रकाशक: विनोद पुस्तक मंदिरआगरा-282002 (Unit III)
4. पुस्तक: व्याकरणप्रदिप–रामदेवप्रकाशक: हिन्दीभवन36 इलाहाबाद-211024(Unit IV)
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17(Unit V)

Course Code	Course Name	Category	L	T	P	Credit
231TL1A3MA	MALAYALAM- III	LANGUAGE-I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2	✓				✓
CO3		✓	✓		
CO4	✓			✓	✓
CO5	✓	✓	✓		✓

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A3MA	MALAYALAM- III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Poetry** 10 h

Kumaranasan

Unit II **Poetry** 10 h

Kumaranasan

Unit III **Poetry** 10 h

Kumaranasan

Unit IV **Poetry** 10 h

VayalarRamavarma

Unit V **Poetry** 08 h

VayalarRamavarma

Text Books

1 Kumaranasan. 1998. Chinthavishtayaya Sitha. DC Books Kottayam, Kerala, India.(Unit I to III)

2 Ayisha (Poem), National Book Stall Kottayam, Kerala, India. (Unit IV & V)

Reference

1 Dr.M.Leelavathy.Kavitha Sahithya Charithram. Sahithya Academy Thrissur, Kerala, India.

Course Code	Course Name	Category	L	T	P	Credit
231TL1A3FA	FRENCH- III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓			
CO3			✓	✓	
CO4	✓	✓			✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231TL1A3FA	FRENCH- III	SEMESTER III

Total Credits: 3
Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

° Décrireun lieu. ° Situer	A partird'unerecherche de documents, composer une presentation touristique pour un magazine ou un site internet.	Comprehendre la description d'un lieu. Décrireunevilleouunerégionq u'onaime. Interrogersur la situation of d'un lieu. Comprendre des indications sur la fréquenced'actions.	Comprendreune presentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation precise dans un message électronique.

Unit II 10 h

Se situerdans le temps.	A partird'unerecherc he de documents, composer une presentation touristique pour un magazine ou un site internet.	Comprehendre la description d'un lieu. Décrireunevilleouunerégio nqu'onaime. Interrogersur la situation of d'un lieu. Comprendre des indications sur la fréquenced'actions.	Comprendreune presentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation precise dans un message électronique.

Unit III 10 h

Raconter. ° Décrire les étapesd'une action.	Raconterune scene insolite à l'oreal et à l'écrit.	Comprehendre le récit d ún voyage. Raconterses actions quotidiennes.	Ecrire une biographie a partir d'eléments écrits.

Unit IV 10 h

Exprimer l'intensité et la quantité. ° Interroger.	Raconterune scene insoliteà l'oreal et à l'écrit.	Comprehendre le récit d ún voyage. Raconterses actions quotidiennes.	Ecrire une biographie a partir d'eléments écrits.

Unit V 08 h

Make in Own Sentences based on the above Lessons

Text Book

1 LATITUDES 1 (Méthode de français) Pages from 102-127, Author : ReginеMérieux, Yves Loiseau(Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
231EL1A3EA	ENGLISH - III	LANGUAGE- II	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the basics of English grammar and specific usage
- the importance of the vocabulary and its use in different contexts
- the necessity of communication and composition writing skills

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Infer the specific usage of while-listening process	K2
CO2	Organize the various abilities and sub-skills involved in reading	K3
CO3	Utilize the importance of speaking skills and developing it through various practices	K3
CO4	Master diverse business communication formats and skills	K4
CO5	Acquire all-round mature outlook to function effectively in different context	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1			✓		✓
CO2	✓	✓		✓	
CO3	✓		✓		✓
CO4	✓		✓		]
CO5	[]	[✓]	[]	[✓]	[]

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

231EL1A3EA	ENGLISH - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Listening and Reading 09 h

Listening in casual conversation, Small group and Conference setting - Listening for Factual Information- Barriers of Listening- Developing Listening skills- Poor listening vs Effective Listening - Basics of Reading- Efficient and Inefficient Readers- Advantages of Reading- Four Basic steps of Effective Reading- Stumbling blocks in becoming an effective Reader- Strategies for Comprehending and Retaining content- Effective Note Taking while Reading

Unit II Speaking 09 h

Purpose of General Conversations- Advantages, Features of a good conversation- Tips for improving Conversation- Public Speaking- Importance of Public Speaking- Benefits, Tips, Overcoming fear of Public Speaking- Preparatory steps - Structuring the contents- Audience Awareness- Mode of Delivery

Unit III Writing Skills 10 h

Preparing an Effective CV or a Resume with Job Applications- Employers expectation - Organize the material– Useful suggestions- Cover Letter- Content to be included– Tone of the letter- Report Writing- importance– features- Types – main parts– Feasibility report– Accident report- Scientific report- Memos – Introduction– Structure- Proposal Writing

Unit IV English for Communication & Skill for Employment 12 h

Notices, Agendas and Minutes- Business correspondence- Speeches- Meetings, Vocabulary Development- Editing Skills, and Reference Skills- Reading and Replying to E-Mails- Making Presentations- Interview Techniques- Group Discussion, and Oral Presentation Skills- Interacting with Superiors, and Listening to Reports and Customer Complaints- Preparing the minutes of a meeting- Presenting Data in Verbal and Non-verbal modes- The Correct Attitude of Employment

Unit V Soft Skills 08 h

Importance of soft skills- Attributes- Social Skills- Thinking- Negotiating- Exhibiting- Identifying - Soft Skills training -Train Yourself- Practicing soft skills- Measuring attitude – Self-Discovery: Importance of knowing yourself- Process - SWOT analysis – Benefits – Usage – SWOT Analysis grid- Art of Negotiation

Text Books

1. Camp and Satterwhite. 1998. College English and Communication. 7th Edition Glencoe Mchrawttill Publishers, New York, Unites States of America. (Unit I, II, III)
2. Kumar, Sanjay and Lata Pushp. 2018. Language and Communication Skills for Engineers. First Edition, Oxford University Press, India. (Unit I, II, III)
3. Mohan, Krishna and Banerji, Meera. 2009. Developing Communication skills. 2nd Edition, Macmillcan, India. (Unit I, II, III, IV)
4. Alex. Soft Skills. 2009. S. Chand Publishing, New Delhi, India. (Unit V)

References

1. Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw- Hill Education, Chennai, India.
2. Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, United Kingdom.
3. Mishra, Gauri and Ranjana Kaul.2016. Language Through Literature. Primus Books, India.
4. Pillai G, Radhakrishna. 2000. English for Success. Emerald Publishers, Chennai, India.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A3CA	MECHANICS	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the concept and impact of forces on various terms of bodies
- the method of finding mass centre using integration
- the applications of simple harmonic motion and projectiles

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	describe the impact of forces on a particle	K2
CO2	discuss the influence of coplanar forces on a rigid body	K2
CO3	explain the concept of centre of mass	K2
CO4	apply the principle of virtual work concepts in real life problems	K3
CO5	analyze the concept of simple harmonic motion	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2		✓		✓	
CO3	✓		✓		✓
CO4			✓	✓	
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A3CA	MECHANICS	SEMESTER III

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Force & Equilibrium 10 h

Newton's laws of motion-resultant of two forces on a particle-equilibrium of a particle-limiting equilibrium of a particle on an inclined plane.

Unit II Forces on a Rigid body 13 h

Moment of a force - general motion - equivalent systems of forces - parallel forces - forces along the sides of a triangle – couples - resultant of several coplanar forces - line of action of the resultant-equilibrium of a rigid body under three coplanar forces.

Unit III Reduction of forces and centre of mass 12 h

Reduction of coplanar forces into a force and a couple-problems involving frictional forces-centre of mass- finding mass centre- hanging body in equilibrium.

Unit IV Stability, Virtual work and Hanging strings 12 h

Stability of equilibrium-stability using differentiation-virtual work-equilibrium of a uniform homogeneous string-suspension bridge.

Unit V Rectilinear motion under varying forces & Projectiles 13 h

Simple harmonic motion - S.H.M. along a horizontal line and vertical line - motion under gravity in a resisting medium - forces on a projectile - projectile projected on an inclined plane - enveloping parabola.

Text Books

1 Duraipandian P, Laxmi Duraipandian, Muthamizh Jayapragasam,2014, "Mechanics ", S. Chand & Company Pvt. Ltd, New Delhi

References

1 Naveen Kumar, 2010, "Mechanics", Narosa Publishing House, New Delhi

2 Venkataraman M.K. ,2012,"Statics", Agasthiar Publications, Trichy

3 Venkataraman M.K.,2012,"Dynamics", Agasthiar Publications, Trichy.

4 Raisinghania M.D, 2006, "Dynamics", Sultan Chand and Sons, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A3CB	PROBABILITY THEORY	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the method of defining random variables
- applications of expectation and variance
- measure the relationship between two random variables

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	define the basic concepts of probability theory	K2
CO2	describe random variables and its corresponding functional forms	K3
CO3	compute Mathematical expectation and variance for analyzing the relation between variables	K4
CO4	illustrate generating functions corresponding to random variables with theorems	K3
CO5	employ the concept of correlation and regression analysis	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	
CO2	✓			✓	✓
CO3	✓	✓	✓		
CO4		✓	✓	✓	✓
CO5		✓		✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A3CB	PROBABILITY THEORY	SEMESTER III

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Probability 13 h

Basic terminology- mathematical probability- statistical probability- subjective probability- mathematical tools-theorems on probability- conditional probability - multiplication theorem of probability-independent events.

Problems related to analyze the impact of diseases: cancer-obstetrics-pulmonary disease-hypertension- genetics.

Unit II Random variables 12 h

Discrete and continuous random variables - distribution function- two-dimensional random variable - joint probability mass function-marginal and conditional probability distributions - independence of random variables.

Representation of random variables in the field of Ophthalmology - Otolaryngology- Hypertension related problems.

Unit III Mathematical Expectation 11 h

Expected value - expected function - properties – covariance -inequalities involving expectation - moments of bivariate probability distributions - conditional expectation and conditional variance.

Computation of average level of risk arising in Hypertension and Otolaryngology

Unit IV Generating Functions 11 h

Moment generating functions - cumulants - characteristic functions - theorems - Chebychev's inequality - weak law of large numbers.

Unit V Correlation & linear regression 13 h

Correlation – scatter diagram – Karl Pearson's coefficient of correlation – calculation of the correlation coefficient for a bivariate frequency distribution – probable error on correlation coefficient - rank correlation - linear regression.

Correlating the impact of risk factors in Hypertension – Obstetrics – Pediatrics - Cardiovascular Disease - Pulmonary Function

Text Books

1 Gupta S.C and Kapoor V.K, 2022, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi.

2 Bernard Rosner, 2015, " Fundamentals of Biostatistics", United States of America Print, Harvard University USA.

References

1 Gupta C B and Vijay Gupta, 2007,"Introduction to Statistical Methods", S.Chand&Co, New Delhi.

2 Sanchetti D.C and Kapoor V.K, 2010, "Statistic", S. Chand & Co, New Delhi.

3 Veerarajan T, 2017,"Fundamentals of Mathematical Statistics", Yes Dee Publishing Pvt. Ltd, Chennai.

4 Paul G. Hoel, 2018, "Introduction to Mathematical Statistics", John Wiley India Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A3CC	NUMERICAL METHODS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the effectiveness of numerical solution over analytical solution
- error analysis of a method to examine its accuracy
- the method of solving various real time problems

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	demonstrate the solution of linear systems by Gauss Elimination and Seidal methods	K2
CO2	develop skills in analyzing the methods of interpolating a given data	K4
CO3	analyze and estimate the accuracy of numerical methods	K4
CO4	apply the numerical methods to find the solution of ordinary differential equations	K3
CO5	examine the solution of partial differential equations by using numerical methods	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓		✓	
CO3	✓	✓			
CO4			✓		
CO5	✓	✓			✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A3CC	NUMERICAL METHODS	SEMESTER III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Solution of Algebraic equation and Linear System 10 h

Newton-Raphson method - Direct Methods: Gaussian Elimination method- Gauss Jordan method - modification of Gauss Method to compute the inverse - LU decomposition method - solution of Tridiagonal systems.

Unit II Interpolation 10 h

Errors in polynomial interpolation - finite differences - detection of errors - differences of a polynomial - Newton's formulae - Gauss's central difference formulae - Stirling's formula - Lagrange's interpolation formula - errors - Hermite's interpolation Formula.

Unit III Numerical Differentiation and Integration 9 h

Numerical Differentiation - Maximum and minimum values of a tabulated function - numerical Integration - Trapezoidal rule - Simpson's 1/3 rule - Simpson's 3/8 rule - Boole's and Weddle's rules

Unit IV Numerical Solution of Ordinary Differential Equations 9 h

Solution by Taylor's series - Picard's method of successive approximations - Euler's method - Runge-Kutta methods - Predictor-Corrector methods

Unit V Numerical solution of Partial Differential Equations 10 h

Finite Difference approximations to derivatives - Laplace's equation - Jacobi's method - Gauss-Seidel method

Text Books

1 Sastry S.S., 2012, "Introductory methods of Numerical Analysis", Fifth Edition, Prentice-Hall of India, New Delhi

References

1 Venkataraman M K., 1999,"Numerical Methods in Science and Engineering", Fifth Edition, National Publishing Company, Chennai

2 Grewal B.S., 2010, "Numerical Methods in Engineering & Science: with Programs in C and C++", Tenth Edition, Khanna Publishers, New Delhi

3 Jain M.K., Iyengar, S.R.K. and Jain, R.K., 2012, "Numerical methods for Scientific and Engineering Computation", New Age International, New Delhi.

4 Curtis F Gerald, Patrick O. Wheatley, 2007, "Applied Numerical Analysis", Seventh Edition, Pearson Education India Ltd., New Delhi

Course Code	Course Name	Category	L	T	P	Credit
235CI1A3IA	BUSINESS ACCOUNTING	IDC	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- to analyze business transactions from an accounting viewpoint.
- to recognize, record, and classify new accounting data
- to understand the cost accounting concepts

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	describe the accounting cycle, write simple journal entries and compute a trial balance	K1
CO2	obtain knowledge to prepare final accounts of a company and to gain skills to detect and prevent errors in journal and ledger accounts	K2
CO3	capture the procedures relating to bills of exchange, Account current and Average due date	K2
CO4	understand accounting treatment for consignment and Joint venture	K3
CO5	perform cost volume profit analysis and identify relevant costs.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2		✓	✓		✓
CO3		✓		✓	
CO4				✓	
CO5	✓	✓			✓

COURSE FOCUSES ON

☑	Skill Development	☐	Entrepreneurial Development
☑	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

235CI1A3IA	BUSINESS ACCOUNTING	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Fundamentals of Book Keeping 10 h

Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books: Purchases Book, Sales Book, Purchases Returns, Sales Return book, Cash Book (Single Column, Double Column and Triple Column) - Trial balance.

Unit II Final Accounts 10 h

Final accounts of a sole trader with adjustments: Trading Account, Profit and loss account, Balance Sheet, Adjustments

Unit III Bill of exchange 9 h

Definition of bill of exchange, essentials of Bill of exchange, classification of bill of exchange, Accounting Treatment Of Bill Of Exchange (bill retained, bill discounted with bank, bill endorsed, bill sent for collection, renewal of bill, Accommodation bills)

Unit IV Consignments and Joint venture 10 h

Consignment meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price and invoice price, various commission to consignee (only Problem). Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment, accounting treatment for joint venture: when keeping separate sets of books is kept and without keeping separate set of books (Only Theory).

Unit V Basics of Cost Accounting 9 h

Meaning - definition – Difference between cost accounting and financial accounting- Advantages and disadvantages- Element of cost - preparation cost sheet – stock levels-EOQ-Methods of pricing of stock issue-FIFO-LIFO Simple average method – weighted average method.

Note: The question paper shall cover 20% theory and 80% problem

Text Books

1 Gupta R.L., Radhaswamy M., 2014, Financial Accounting, S.Chand & Company Ltd., New Delhi

2 Jain S P and Narang K L, 2019, Cost accounting, Kalyani publishers, New Delhi

References

1 Gupta R.L., Gupta V.K. and Shukla M.C., 2006, Financial Accounting, Sultan Chand & Sons, New Delhi.

2 Maheswari S.K., and Reddy T.S., 2005, Advanced Accountancy, Vikas Publishers, New Delhi.

3 S.N.Maheswari, Suneel K Maheswhwari and Sharad K Maheswari, 2022, Advanced Accountancy, (Volume I) [11th Edition], S Chand & Company Limited.

4 Pillai. R.S.N and Bagavathi, Uma.S. 2012. Fundamentals of Advanced Accounting (Volume I). [Third Revised Edition]. Sultan Chand & Company Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A3SA	OPTIMIZATION TECHNIQUES	SEC	2	2	-	2

PREAMBLE

This course has been designed for students to learn and understand

- the optimal use of available resources
- the concept of simplex and duality in linear programming
- the time cost relationship and resource allocation

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	define the problem in the form of linear programming problem	K1
CO2	Formulate duality in linear programming problem	K2
CO3	compute the optimum solution for any form of transportation problem	K3
CO4	illustrate allocation of available resources to equal number of activities so as to minimize cost	K3
CO5	analyze the PERT and CPM network techniques	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			✓
CO2	✓		✓		✓
CO3		✓		✓	✓
CO4	✓		✓		
CO5	✓	✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A3SA	OPTIMIZATION TECHNIQUES	SEMESTER III

Total Credits: 2

Total Instruction Hours: 48 h

Syllabus

Unit I Linear Programming Problem 9 h

Basic assumptions - advantages - application areas - formulating a problem as an LP model - examples - graphic method - some special cases.

Unit II Simplex method and Duality 10 h

Basic terms - computational aspect - special situations - formulation of dual LPP - construction of dual from primal - advantages - Interpreting Primal dual optimal solutions

Unit III Transportation Problem 10 h

Formulation - LP formulation – solution procedure – methods for finding initial solution - test for optimality - variations - maximization – sensitivity analysis.

Unit IV Assignment Problem 9 h

Mathematical model of assignment problem - solution methods – assignment algorithm - special variations

Unit V Project Network Analysis 10 h

Development of network analysis concept - developing the project network - critical path analysis - critical path method – programme evaluation and review technique - analysis of time-cost relationship - resource allocation.

Text Books

1 Kapoor V.K., 2022, "Operations Research - Quantitative Techniques for Management", Ninth edition, Sultan Chand & Sons, New Delhi

References

1 Kandi Swarup, Gupta P.K, Man Mohan, 2018, "Operations Research", 19th Edition, Sultan Chand & Sons, New Delhi

2 Panneerselvam R., 2009, "Operations Research", 2nd Edition, PHI Learning Private Limited, New Delhi

3 Taha, H.A., 2006, "Operations Research: An Introduction", 5th Edition, Prentice Hall of India Private Limited, New Delhi

4 Man Mohan, Gupta. P.K, 2004, "Problems in Operations Research", 14th Edition, Sultan Chand & Sons, New Delhi

232MT1ASSA	SELF STUDY: HISTORY OF MATHEMATICS	SEMESTER III

Total Credits: 1

Syllabus

Unit I Traces

Concepts and Relationships - Early Number Bases – Number Language and Counting - Spatial Relationships. Ancient Egypt: The Era and the Sources - Numbers and Fractions - Arithmetic Operations - "Heap" Problems - Geometric Problems - Slope Problems – Arithmetic Pragmatism. Mesopotamia: The Era and the Sources - Cuneiform Writing - Numbers and Fractions: Sexagesimals – Positional Numeration - Sexagesimal Fractions – Approximations – Tables – Equations - Measurements: Pythagorean Triads - Polygonal Areas - Geometry as Applied Arithmetic. Hellenic Traditions: The Era and the Sources - Thales and Pythagoras - Numeration - Arithmetic and Logistic - Fifth Century Athens - Three Classical Problems.

Unit II Euclid of Alexandria

Alexandria - Lost Works - Extant Works - The Elements. Archimedes of Syracuse: The Siege of Syracuse - On the Equilibriums of Planes - On Floating Bodies - The Sand-Reckoner - Measurement of the Circle - On Spirals - Quadrature of the Parabola - On Conoids and Spheroids - On the Sphere and Cylinder - Book of Lemmas - Semiregular Solids and Trigonometry - The Method. Apollonius of Perge: Works and Tradition - Lost Works - Cycles and Epicycles - The Conics.

Unit III Crosscurrents

Changing Trends - Eratosthenes - Angles and Chords - Ptolemy"s Almagest - Heron of Alexandria - The Decline of Greek Mathematics - Nicomachus of Gerasa - Diophantus of Alexandria - Pappus of Alexandria - The End of Alexandrian Dominance - Proclus of Alexandria Boethius - Athenian Fragments - Byzantine Mathematicians. Ancient and Medieval China: The Oldest Known Texts - The Nine Chapters - Rod Numerals - The Abacus and Decimal Fractions - Values of Pi - Thirteenth-Century Mathematics.

Unit IV Ancient and Medieval India

Early Mathematics in India - The Sulbasutras - The Siddhantas - Aryabhata - Numerals - Trigonometry - Multiplication - Long Division - Brahmagupta - Indeterminate Equations - Bhaskara - Madhava and the Keralese School. The Islamic Hegemony: Arabic Conquests - The House of Wisdom - Al-Khwarizmi -

Abd Al-Hamid ibn-Turk - Thabit ibn-Qurra - Numerals - Trigonometry - Tenth- and Eleventh-Century Highlights - Omar Khayyam - The Parallel Postulate - Nasir al-Din al-Tusi - Al-Kashi.

Unit V The Latin West

Introduction - Compendia of the Dark Ages - Gerbert - The Century of Translation - Abacists and Algorists - Fibonacci - Jordanus Nemorarius - Campanus of Novara - Learning in the Thirteenth Century - Archimedes Revived - Medieval Kinematics - Thomas Bradwardine - Nicole Oresme - The Latitude of Forms - Infinite Series - Levi ben Gerson - Nicholas of Cusa - The Decline of Medieval Learning. The European Renaissance Overview: Regiomontanus - Nicolas Chuquet‟s Triparty - Luca Pacioli‟s Summa - German Algebras and Arithmetics - Cardan‟s Ars Magna - Rafael Bombelli - Robert Recorde - Trigonometry - Geometry - Renaissance Trends - Franc¸ois Vie`te.

Text Books

1 Uta C. Merzbach and Carl B. Boyer, 2010, "A History of Mathematics", Third Edition, John Wiley & Sons, Inc., New Jersey.

Unit - I : Chapters 1, 2, 3 and 4 (upto page 58)

Unit - II : Chapters 5, 6 and 7

Unit - III: Chapters 8 and 9

Unit - IV: Chapters 10 and 11

Unit - V : Chapters 12 and 13

References

1 David M. Burton, 2011, "The History of Mathematics an Introduction", Seventh Edition, McGraw-Hill, New Delhi

2 Roger L Cooke,2014, "The History of Mathematics", Third Edition, Wiley Publications,

3 John StillWell, 2011, "Mathematics and its History", Third Edition, Springer

4 Anne Rooney,201, "The History of Mathematics", Rosen Publishing Group, New York

232MT1ASSB	SELF STUDY: INTRODUCTION TO VEDIC MATHEMATICS	SEMESTER III

Total Credits: 1

Syllabus

Unit I Multiplication

Simple method - Criss cross system of multiplication - multiplication of higher-order numbers - technique for multiplying six-digit numbers - technique for multiplying seven-digit numbers squaring numbers: squaring of numbers using crisscross system and formula method - cube root of perfect cubes.

Unit II Perfect squares and Squaring

Square root of perfect squares- Base method of multiplication: when the number of digits in rhs exceeds number of zeros in the base - multiplying a number above the base with a number below the base - multiplying numbers with different bases - when the base is not a power of ten - base method for squaring.

Unit III Dates and Calendars

Digit sum method. - Magic squares: rules and properties - dates and calendars: single year calendar - technique - characteristics of dates.

Unit IV Simultaneous Linear Equations

General equations - simultaneous linear equations - square roots of imperfect squares: characteristics and methods.

Unit V Division

Cubing numbers: formula method and the anurupya sutra - the rule of zeros - Base method of division - division (part two) - substitution method.

Text Books

1 Dhaval Bathia, 2005, "Vedic Mathematics made easy", First edition, Jaico Publishing House, Mumbai

References

1 Rajesh Kumar Thakur, 2019, "Advanced Vedic Mathematics", First edition, Rupa Publications New Delhi

2 Tirthaji Bharati Krsna, 1990, "Vedic Mathematics", Original Edition, Motilal Banarsidass Publisher, New Delhi

3 Atul Gupta, 2010, "The Power of Vedic Maths", Second edition, Jaico Publishing House, Mumbai

4 Atul Gupta, 2010, "The Power of Vedic Maths", Second edition, Jaico Publishing House, Mumbai

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BoS- 17th 04.04.2024 | AC - 17th 17.04.2024 | GB -

Academic Council CHAIRMAN Dr.N.G.P. Arts and Science College

Course Code	Course Name	Category	L	T	P	Credit
231TL1A4TA	TAMIL - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓	✓		✓
CO2	✓			✓	
CO3		✓			✓
CO4			✓		
CO5	✓			✓	✓

COURSE FOCUSES ON

✓	Skill Development	-	Entrepreneurial Development
✓	Employability	-	Innovations
-	Intellectual Property Rights	-	Gender Sensitization
-	Social Awareness/ Environment	-	Constitutional Rights/ Human Values/ Ethics

231TL1A4TA	TAMIL - IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **எட்டுத்தொகை** 10 h

1. நற்றிணை – குறிஞ்சித் திணை

I.பா.எண் : 01 – கபிலர்

II.பா.எண் : 88 – நல்லந்துவனார்

III.பா.எண் : 102 – செம்பியனார்

2. குறுந்தொகை – முல்லைத்திணை

I.பா.எண் : 65 – கோவூர்கிழார்

II. பா.எண் : 167 – கூடலூர்கிழார்

மருதத்திணை

I.பா.எண் : 08 – ஆலங்குடி வங்கனார்

II.பா.எண் : 61 – தும்பிசேர்கீரனார்

III.பா.எண் :196 – மிளைக் கந்தன்

நெய்தல் திணை

I.பா.எண் : 57 – சிறைக்குடி ஆந்தையார்

Unit II **எட்டுத்தொகை** 08 h

1. கலித்தொகை – பாலைக்கலி

I.பா.எண் : 09 – பெருங்கடுங்கோ

2. அகநானூறு - மருதத்திணை

I.பா.எண் : 86 – நல்லாவூர்கிழார்

3. புறநானூறு - I.பா.எண் : 188 – பாண்டியன் அறிவுடை நம்பி

II.பா.எண் : 192 – கணியன் பூங்குன்றனார்

III.பா.எண் : 279 – ஒக்கூர் மாசாத்தியார்

IV.பா.எண் : 312 – பொன்முடியார்

Unit III **பத்துப்பாட்டு** 10 h

1. பட்டினப் பாலை – கடியலூர் உருத்திரங் கண்ணனார் -1முதல் 218 வரிகள் வரை மட்டும்.

Unit IV **இலக்கிய வரலாறு** 10 h

1. எட்டுத் தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்

Unit V **இலக்கணம் மற்றும் திறனாய்வுப் பகுதி** 10 h

I. இலக்கணம்

1. அகத்திணை – அன்பின் ஐந்திணை - விளக்கம்
2. புறத்திணை – 12 திணைகள் - விளக்கம்

II. பயிற்சிப் பகுதி

சங்கப் பாடல்கள் குறித்து திறனாய்வு செய்தல்.

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது.

Text Book

செய்யுள் திரட்டு - மொழிப் பாடம் - 2023- 24

1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,(Unit I - V)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு -2014, தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு- 2013, இலக்கணம் -இலக்கிய வரலாறு - மொழித்திறன் -பூவேந்தன் பதிப்பகம், சென்னை.

3 தமிழ் இணையக் கல்விக்கழகம்.<http://www.tamilvu.org/>

Course Code	Course Name	Category	L	T	P	Credit
231TL1A4HA	HINDI - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2		✓			✓
CO3	✓		✓	✓	
CO4					✓
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development	-	Entrepreneurial Development
✓	Employability	-	Innovations
-	Intellectual Property Rights	-	Gender Sensitization
-	Social Awareness/ Environment	-	Constitutional Rights/ Human Values/ Ethics

231TL1A4HA	HINDI- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

नाटक

Unit II 10 h

एकांकी

Unit III 10 h

काव्य मंजरी

Unit IV 10 h

सूचना लेखन

Unit V 08 h

अनुवाद अभ्यास- III

Text Books

1. लडाई – सर्वेश्वरदयाल सक्सेना प्रकाशक: वाणी प्रकाशन 21-A, दरियागंज नई दिल्ली-110002. (Unit I)
2. एकांकी पंचामृत – डॉ राम कुमार (भोर और तारा छोड्कर) प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001. (Unit II)
3. काव्य मंजरी- (डा मुन्ना तिवारी) मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक. (Unit III)
4. सूचना लेखन पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद -211024. (Unit IV)
5. अनुवाद अभ्यास (केवल अंग्रेजी से हिन्दी में) (पाठ 10 to 20) प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17 (पाठ10 to 20). (Unit V)

Course Code	Course Name	Category	L	T	P	Credit
231TL1A4MA	MALAYALAM- IV	LANGUAGE - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2	✓				✓
CO3		✓	✓		
CO4	✓			✓	✓
CO5	✓	✓	✓		✓

COURSE FOCUS ON

✓	Skill Development	-	Entrepreneurial Development
✓	Employability	-	Innovations
-	Intellectual Property Rights	-	Gender Sensitization
-	Social Awareness/ Environment	-	Constitutional Rights/ Human Values/ Ethics

231TL1A4MA	MALAYALAM- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Drama** 10 h

Saketham- Sreekandan Nair

Unit II **Drama** 10 h

Saketham- Sreekandan Nair

Unit III **Drama** 10 h

Saketham- Sreekandan Nair

Unit IV **Screen Play** 10 h

Perumthachan- Vasudevan Nair

Unit V **Screen Play** 08 h

Perumthachan- Vasudevan Nair

Text Books

1 Nair, Sreekandan C.N. 2023. Saketham, Drama. DC Books Kottayam, Kerala, India. (Unit I to III)

2 Nair, Vasudevan M.T. 1994. Perumthachan- Screenplay. DC Books Kottayam, Kerala, India. (Unit IV & V)

Reference

1 Sankarapillai. 2005. Malayala Nataka Sahithya Charithram, Kerala Sahithya Akademi Publishers, Kerala, India.

Course Code	Course Name	Category	L	T	P	Credit
231TL1A4FA	FRENCH - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓			
CO3			✓	✓	
CO4	✓	✓			✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	_	Entrepreneurial Development
✓	Employability	_	Innovations
_	Intellectual Property Rights	_	Gender Sensitization
_	Social Awareness/ Environment	_	Constitutional Rights/ Human Values/ Ethics

231TL1A4FA	FRENCH - IV	SEMESTER IV

Total Credits: 3
Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

°Décrirequelqu'un. ° Comparer	En milieu professional, recruiter quelqúun et justifier sonchoix.	S'exprimersur les styles de vêtemantReconnaitre des personnes à partit de descriptions.	Comprendre la description de personnesdans un extrait de roman.

Unit II 10 h

ExprimerPaccord ou le désaccord. ° Se situerdans le temps.	En milieu professional, recruiter quelqúun et justifier sonchoix.	Décrire des personnes. Comprendre des personnes qui experiment leur accord ouleurdésaccord.	Comprendre des différences de points de vueexprimétesdans de message électronique. Raconter unsourvenir.

Unit III 10 h

° Parler de Pavenir.	Discuter de l'organisation d'un voyage de groupepuispréparerune fiche projet et la templit.	Comprendreune chanson. Echangersursesprojets de vacancy	Comprendre le message d'une carte d'anniversaire

Unit IV 10 h

° Exprimer des souhaits. ° Décrirequelq u'u n	Discuter de l'organisation d'un voyage de groupepuispréparerune fiche projet et la templit.	Discuter du programme de la soire à venir. Addresser des souhaits à quelqu'un.	Comprendre le message d'une carte d'anniversaire

Unit V 08 h

Make in Own Sentences based on the above Lessons

Text Book

1 LATITUDES 1 (Méthode de français) Pages from 128-151, Author : Regine Mérieux, Yves Loiseau (Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
231EL1A4EA	ENGLISH - IV	LANGUAGE II	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- how language shapes society, enhancing critical reading, writing, and thinking skills through various literary forms
- the fundamentals of writing, including essay composition, persuasive communication, and creative expression
- the process of critical thinking through the analysis of literature

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Summarize main points and supporting details from listening to public addresses and demonstrate poem comprehension.	K2
CO2	Demonstrate clear and expressive speech while engaging in role-play and dramatization activities.	K3
CO3	Interpret textual elements such as themes, tone, and authorial intent in various reading materials.	K3
CO4	Produce clear summaries and paraphrases, maintaining the essence of the original text.	K3
CO5	Prepare for job interviews by employing appropriate interview techniques, confidence, and professionalism.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	✓
CO2		✓		✓	
CO3	✓		✓		
CO4		✓			✓
CO5	✓		✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

231EL1A4EA	ENGLISH - IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Listening 10 h

Nissim Ezekeil - Goodbye Party for Miss Pushpa T.S.
D.H. Lawrence - Last Lessons of the Afternoon
Dr. APJ Abdul Kalam's speech at European Union
Listening for subtext – Tone and Emotion – Vivid Language and Pacing – Listening for Vision and Hope – Use of Storytelling
Punctuations: Periods, Commas, Semicolons, Colons, Apostrophes, Ellipses, Exclamation Points

Unit II Speaking 10 h

Oscar Wilde - The Importance of Being Earnest
Direct Speech and Indirect Speech - Commands and Requests, Exclamations and Wishes, Conversion of Indirect to Direct
Rules for changing direct speech into indirect speech

Unit III Reading 09 h

Gita Hariharan - The Remains of the Feast -
Langston Hughes - Thank You M'am
Making Inferences and Predictions - Identifying Author's Purpose and Tone- Contextual Vocabulary Building
Tenses: The Uses of Present, Past and Future Tenses

Unit IV Writing Skills 10 h

George Orwell - Why I Write
Summarizing vs. Paraphrasing - Expressing Purpose and Intent in Writing- Constructing Strong Arguments and Opinions
Grammar - Paraphrasing - Use of Paraphrasing, Characteristics of a good paraphrase, The Paraphrase of Poetry, Special Hints, Method of Procedure

Unit V Soft Skills 09 h

Steve Jobs - 2005 Stanford Commencement Address - Effective Communication - Presentation Skills
Business Corporate Soft Skills - Six common corporate conversation faux pas, Decision making Techniques, Negotiation Styles Job Interviews - Preparatory Steps for Job Interviews - Interview Skill Tips

Text Books

1. Straus, Jane, Lester Kaufman, and Tom Stern, editors. The Blue Book of Grammar and Punctuation: An Easy-to-Use Guide with Clear Rules, Real-World Examples, and Reproducible Quizzes. 12th ed., Jossey-Bass, 2021. (Unit I)
2. Wilde, Oscar. The Importance of Being Earnest. Edited by Norman Page, 2nd ed., Penguin Classics, 2000. (Unit II)
3. Hariharan, Gita. The Remains of the Feast. 1st ed., Penguin Books India, 1992. (Unit III)
4. Orwell, George. "Why I Write." George Orwell: An Anthology of His Prose, edited by John Carey, Harcourt, 2000. pp. 232-237. (Unit IV)
5. Meyer, John. The Soft Skills Handbook for Corporate Success: Essential Strategies for Business Professionals. 2nd ed., Business Insights, 2020. (Unit V)

References

1. Lawrence, D.H. The Complete Poems of D.H. Lawrence. Edited by V.J. Harding, 1st ed., Heinemann, 1992.
2. Buczynski, Mark. Soft Skills for the Workplace: How to Build Successful Relationships and Advance Your Career. 2nd ed., Wiley, 2018.
3. Hughes, Langston. "Thank You, M'am." The Penguin Anthology of American Poetry, edited by Rita Dove, Penguin Books, 2006, pp. 530-533.
4. Nelson, Brian. The Soft Skills Handbook: Essential Skills for the Workplace. 3rd ed., Business Publishing, 2019.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A4CA	ELEMENTS OF MATHEMATICAL ANALYSIS	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the concept of real number system.
- the notion of metric spaces
- the application of continuity in real number system.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	describe the real number system and its extended form	K1
CO2	define the various forms of sets assigned to real number system	K1
CO3	demonstrate an ability to understand and manipulate the theorems in point set topology	K2
CO4	explain the concept of metric spaces and the influence of limits in it	K2
CO5	apply the concept of continuity in examining the connectedness of sets	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓		✓	✓
CO4	✓		✓		
CO5	✓	✓	✓		✓

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A4CA	ELEMENTS OF MATHEMATICAL ANALYSIS	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I The Real and Complex number system 14 h

Field and order – geometric representation - unique factorization theorem – upper bounds, maximum element, least upper bound - completeness axiom – some properties –Archimedean property – Rational numbers with finite decimal representation and approximations – Infinite decimal representation– absolute values and the triangle inequality –Cauchy-Schwarz inequality- extended real number system.

Unit II Basic notions of Set theory 12 h

Ordered pairs – Cartesian product– Relations and functions – one-to-one functions and inverses – Composite functions – Sequences – similar sets – finite and infinite sets – countable and uncountable sets – uncountability of the real number system – set algebra – countable collection of countable sets.

Unit III Point Set Topology 10 h

Euclidean space – open balls and open sets - structure of open sets - closed sets – adherent and accumulation points – closed sets and adherent points –Bolzano – Weierstrass theorem – Cantor's intersection theorem.

Unit IV Point Set Topology and Metric Spaces 10 h

Lindelof covering theorem –Heine-Borel covering theorem – compactness in R^n- spaces - metric spaces - point set topology - compact subsets – boundary of a set - Limits: convergent sequences – Cauchy sequences – complete metric spaces.

Unit V Limits and Continuity 14 h

Limit of a function - limits of complex valued functions - limits of vector valued functions - continuous functions – continuity of composite functions – continuous complex valued and vector valued functions - examples of continuous functions - continuity and inverse image of open or closed sets - function continuous on compact sets.

Text Books

1 Tom M. Apostol, 2002, "Mathematical Analysis", Second Edition, Narosa Publishing House Pvt. Ltd., New Delhi.

References

1 Somasundaram.D, Choudhary.B.2015, "A first course in Mathematical Analysis", Narosa publishing house, New Delhi.

2 Mainak Mukherjee, 2015, "A course in Real Analysis", Narosa publishing house. New Delhi.

3 Shanti Narayan, Raisinghania M D, 2014, "Elements of Real Analysis", S.Chand and company Pvt. Ltd., New Delhi.

4 Dipak Chatterjee, 2005, "Real Analysis", Prentice- Hall of India Pvt. Ltd., New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A4CB	MATHEMATICAL STATISTICS	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the core principles of discrete and continuous probability distributions
- How to utilize the sampling distributions to address statistical problems
- the essentials of statistical inference.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	identify and apply the discrete distribution.	K1
CO2	solve problems involving continuous probability distributions.	K2
CO3	apply moment generating functions in probability theory	K2
CO4	analyze and apply F distributions in complex statistical scenarios	K3
CO5	explore Balckwellization in Statistical inference	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A4CB	MATHEMATICAL STATISTICS	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Discrete Probability Distributions 12 h

Introduction - discrete uniform distribution -Bernoulli distribution - Binomial distribution –Poisson distribution.

Problems related to analyze the impact of diseases: Infectious disease-pulmonary disease-bacteriology-cancer-genetics.

Unit II Continuous Probability Distributions 12 h

Introduction - normal distribution –rectangular distribution - gamma distribution.

Representation of continuous random variables in the field of hypertension-cardiovascular disease-infectious disease.

Unit III Exact Sampling Distributions-I 12 h

Introduction - Derivation of the Chi-Square Distribution- moment generating function - theorems -linear transformation – applications.

Unit IV Exact Sampling Distributions- II 12 h

Introduction- Student's t-distribution- applications - F-distribution and its applications - relation between t and F-distributions - relation between F and Chi-Square distributions.

The impact of risk factors in gynecology-cardiovascular disease -pediatrics.

Unit V Statistical Inference 12 h

Introduction – characteristics of estimators– Cramer-Rao inequality – complete family of distributions - MVUE and Blackwellisation.

Estimate the level of risk arising in cardiovascular disease-diabetes-obstetrics-hypertension.

Text Books

1 Gupta S.C and Kapoor V.K, 2022, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi.

2 Bernard Rosner, 2015, " Fundamentals of Biostatistics", Harvard University Press, Newyork.

References

1 Gupta. C.B and Vijay Gupta, 2007,"Introduction to Statistical Methods", S.Chand & Co, New Delhi.

2 Sanchetti D.C and Kapoor V K, 2010, "Statistics", S.Chand & Co , New Delhi.

3 Veerarajan T, 2017,"Fundamentals of Mathematical Statistics", Yes Dee Publishing Pvt. Ltd, Chennai.

4 Paul G Hoel, 2018, "Introduction to Mathematical Statistics", John Wiley India Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A4CC	MATHEMATICAL MODELING	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the art of Mathematical modeling
- complex modeling scenarios using systems of ODEs of first and second order
- the application of linear and non-linear programming, as well as the maximum principle

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify basic modeling techniques	K1
CO2	recognize non-linear growth and decay models	K2
CO3	model epidemics and compartmental situations.	K2
CO4	analyze the influence of difference equations in modeling	K3
CO5	apply the linear programming and maximum principle techniques in modeling.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	✓
CO2		✓	✓	✓	✓
CO3	✓		✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓	✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A4CC	MATHEMATICAL MODELING	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Mathematical Modeling 10 h

Simple situations requiring mathematical modelling- technique – classification – characteristics - Mathematical modelling through Geometry, Algebra, Trigonometry and Calculus - limitations.

Unit II Modeling Through ODE of First Order 9 h

Introduction - linear growth and decay models - non-linear growth and decay models - compartment models - modelling in dynamics - modelling of geometrical problems.

Unit III Modeling Through Systems of ODE of first and Second order 10 h

Population dynamics – epidemics – compartment models - modelling in Economics, Medicine, arms race battles and international trade - planetary motions – circular motion and motion of satellites – modelling through linear differential equations.

Unit IV Modeling Through Difference Equations 10 h

Simple models – basic theory – modelling in Economics, finance, population dynamics, genetics – probability theory- miscellaneous examples.

Unit V Modeling Through Mathematical Programming, Maximum Principle and Maximum-Entropy Principle 9 h

Mathematical modelling through linear programming, non-linear programming -maximum principle- use of principle of maximum entropy.

Text Books

1 J N Kapur, 2015, "Mathematical Modelling", New Age International (P) Limited, New Delhi.

References

1 Bimal K. Mishra and Dipak K Satpathi, 2009, "Mathematical Modelling", First Edition, Ane Books Pvt. Ltd., New Delhi.

2 Walter J. Meyer, 2004, "Concepts of Mathematical Modeling", Dover Publications Inc., New Delhi

3 Edward A. Bender, "An Introduction to Mathematical Modeling", John Wiley & Sons, Inc., New York

4 Giordano, F.R. and Weir, M.D., 1985, "A First Course in Mathematical Modeling", Monterey, Brooks/Cole, Singapore

Course Code	Course Name	Category	L	T	P	Credit
234DA1A4IA	INTRODUCTION TO DATA SCIENCE	IDC	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The fundamentals of Data Science Process
- Basic knowledge in Machine Learning, Big data
- Principles of text mining and graph databases

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	understand the concepts of Data science process	K2
CO2	understand the machine learning concepts and its process	K2
CO3	apply Big data techniques for huge data processing	K3
CO4	understand the basic concepts of NoSQL	K2
CO5	implement the graph database and text mining concepts for real world problems	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	✓
CO2	✓	✓	✓		
CO3	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓		✓	✓	✓

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

234DA1A4IA	INTRODUCTION TO DATA SCIENCE	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Data Science Process 10 h

Benefits and uses of Data Science - Facets of data: Structured data, unstructured data- Natural Language data - Machine generated data- Graph based or Network data - Audio, image and video streaming data - Data science process - Big data Eco system and Data Science-Overview of the data science process - Retrieving data

Unit II Machine Learning 9 h

Introduction of Machine Learning - The Modeling process - Types of Machine Learning – Supervised Learning, Unsupervised Learning - Semi-supervised Learning - Applications of Machine Learning in data science - Python tools used in Machine Learning

Unit III Big Data Processing 10 h

Problems in handling large data - General techniques for handling large volumes of data - General programming tips for dealing with large data sets - First step in big data - Distributing data storage and processing with frame works - Case Study-Building a recommender system inside a database

Unit IV NoSQL Databases 10 h

Introduction to NoSQL – ACID, CAP theorem - The BASE principles of NoSQL databases - NoSQL database types - Setting the research goal - Data retrieval and preparation - Data Exploration - Case Study: Disease profiling-presentation and automation

Unit V Graph database, Text mining 9 h

Introduction to connected data and graph databases - Introducing Neo4j: A graph database – Connected data - Text mining in the real world - Text mining techniques - Logical functions - Math functions - Statistical functions

Text Books

1 Davy Cielen, Arno D.B. Meysman, Mohamed Ali, "Introducing Data Science", (2022), 1st Edition, Dream Tech Press, New Delhi.

References

1 Manisha Nigam, "Data Analysis with Excel", (2019), 1st Edition, BPB Publications, New Delhi.

2 Murtaza Haider, Getting started with data science, (2016), 1st Edition, Pearson Education, London.

3 Joel Grus, "Data Science From Scratch", (2019), 2nd Edition, O'REILLY, USA.

Course Code	Course Name	Category	L	T	P	Credit
232MT1A4SA	ADVANCED OPTIMIZATION TECHNIQUES	SEC	2	2	-	2

PREAMBLE

This course has been designed for students to learn and understand

- an application of sequencing problems
- the decision-making process
- the strategical thinking to be applied in business

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	identify a number of different situations which can be characterized as sequencing problems	K1
CO2	analyze equipment replacement decisions	K4
CO3	understand various components of a queuing system	K2
CO4	explain the way of making decisions under certainty	K2
CO5	compute value of the game with mixed strategies	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			✓
CO2	✓		✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		
CO5	✓	✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

232MT1A4SA	ADVANCED OPTIMIZATION TECHNIQUES	SEMESTER IV

Total Credits: 2

Total Instruction Hours: 48 h

Syllabus

Unit I Sequencing Problem 10 h

Sequencing problem - solution to sequencing problems - Johnson's rule.

Unit II Replacement Theory 10 h

Failure mechanism of items – considerations leading to replacement – O.R. methodology– replacement policy for equipment/asset which deteriorates gradually – replacement of items that fail suddenly – staff replacement problems.

Unit III Queuing Theory 10 h

Elementary queuing system - single server queuing model - queuing cost behavior analysis - multiple server queuing model - multi-phase service queuing model – benefits and limitations.

Unit IV Decision Analysis 9 h

Management applications - ingredients of decision problem - types of decision-making environments - Bayesian decision rule - posterior analysis - decision tree analysis

Unit V Theory of Games 9 h

Basic Terminology - solution methods of pure strategy games - principle of dominance - solution methods of mixed strategy games – the 2-person, non-zero sum games - limitations.

Text Books

1 Kapoor V.K., 2022, "Operations Research - Quantitative Techniques for Management", Ninth edition, Sultan Chand & Sons, New Delhi.

References

1 Kandi Swarup, Gupta P.K, Man Mohan. 2018. "Operations Research", 19th Edition, Sultan Chand & Sons, New Delhi.

2 Panneerselvam R., 2009, "Operations Research", 2nd Edition, PHI Learning Private Limited, New Delhi.

3 Taha, H.A., 2006, "Operations Research: An Introduction", 5th Edition. Prentice Hall of India Private Limited, New Delhi.

4 Man Mohan, Gupta. P.K, 2004, "Problems in Operations Research", 14th Edition, Sultan Chand & Sons, New Delhi.

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