Course Code	Title		
18U1TAM101	Language I : Tamil - I		
Semester: I	Credit: 4	CIA: 25 Marks	ESE: 75 Marks

(Common to all UG Programmes)

Course Objective : மொழி இலக்கியத்தின் வாயிலாக அறம்சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல;.

Course Outcome : தமிழ் இலக்கியங்கள் வாயிலாக சமூகச் சீர்திருத்தச் சிந்தனைகள் பெறப்படும்

Offered by : தமிழ்த்துறை

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**அற இலக்கியம் - திருக்குறள்** 1. அறன்வலியுறுத்தல் (31 - 40 குறள்) 2. நடுவு நிலைமை (111 - 120 குறள்) 3. ஈகை (221 - 230 குறள்) 4. புகழ் (231 - 240 குறள்) 5. வாய்மை (291 - 300 குறள்)		
	Instructional Hours		**15**
II	**புதுக்கவிதைகள்** 1. பாரதியார்- நிலவு, வானம் , காற்று 2. பாரதிதாசன் - வான் 3. ஆரூர் தமிழ்நாடன்- கரிக்கிறது தாய்ப்பால் 4. காகிதப்பூக்கள் - நா. காமராசன் 5. மரங்கள் - மு. மேத்தா 6. சுவாசம் - சல்மா		
	Instructional Hours		**15**
III	**பெண்ணியம்** 1. பூச்சி வாழ்க்கை - ஆண்டாள் பிரியதர்சனி (சுயம் பேசும் கிளி) 2. தொட்டிச்செடி - கவிஞர் இளம்பிறை 3. அம்மா - சுகிர்தராணி 4. நீரில் அலையும் முகம் - அ.வெண்ணிலா		
	Instructional Hours		**15**
IV	**சிறுகதைகள்** புதுமைப்பித்தன் சிறுகதைகள் (மூன்றாம் பாகம்)		
	Instructional Hours		**15**
V	**இலக்கண - இலக்கிய வரலாறு** 1. மாணக்கர்களுக்குரிய இலக்கணம் (நன்னூல் மூன்று நூற்பா)		

2. பதினெண்கீழ்க்கணக்கு நூல்கள் - அறிமுகம் 3. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 4. சிறுகதையின் தோற்றமும் வளர்ச்சியும்	
Instructional Hours	**15**
Total Hours	**75**

பார்வை நூல்கள்

1. பாரதியார் - பாரதியார் கவிதைத் தொகுப்பு, அபிராமி பதிப்பகம், 7-பி, கொடிமரத் தெரு, சென்னை - 600013.
2. பாரதிதாசன் - அழகின் சிரிப்பு, அபிராமி பதிப்பகம், 7-பி, கொடிமரத் தெரு, சென்னை- 600013.
3. அப்துல் ரகுமான் - அப்துல் ரகுமான் கவிதைகள், விஜயா பதிப்பகம், கோவை - 641001.
4. மு. மேத்தா - கண்ணீர்ப்பூக்கள், குமரன் புத்தக நிலையம், மதுரை.
5. திருவள்ளுவர் - திருக்குறள் பரிமேலழகர் உரை, சாரதா பதிப்பகம், ஜி - 4, சாந்தி அடுக்ககம், 2.̓.3, ஸ்ரீ கிருஷ்ணாபுரம் தெரு, இராயப்பேட்டை, சென்னை - 600014.
6. ஆண்டாள் பிரியதர்சனி - சுயம் பேசும் கிளி கவிதைத்தொகுப்பு, ராகவேந்திரா வெளியீடு 163.̓.2 பொன்விழா அச்சகம், பாடிக்குட்ட சாலை, அண்ணாநகர், சென்னை.
7. கவிஞர் இளம்பிறை - தொட்டிச்செடி, பொன்னி வெளியீடு, சென்னை - 91.
8. சுகிர்தராணி - தீண்டப்படாத முத்தம், காலச்சுவடு பதிப்பகம், நாகர்கோயில்.
9. அ.வெண்ணிலா - நீரில் அலையும் முகம் முதல் கவிதைத் தொகுப்பு - 2000
10. முனைவர் ச.சுபாஷ் சந்திரபோஸ் - புதுமைப்பித்தன் சிறுகதைகள் (மூன்றாம் பாகம்) பாவை பப்ளிகேஷன்ஸ், சென்னை - 600014.
11. மு.வ. - தமிழ் இலக்கிய வரலாறு சாகித்திய அகாதெமி, புதுதில்லி - 110001.
12. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை - 625001.
13. சல்மா - ஒரு மாலையும் இன்னோறு மாலையும், காலச்சுவடு பதிப்பகம், நாகர்கோவில்.
14. பவணந்தி - தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம், திருநெல்வேலி.

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by
Dr.A.Sridevi **Dr.V.Geetha**			

Course Code	Title		
18U1HIN101	भाग–८ हिंदी		
सत्र : ८	क्रेडिट श्रेय : 4	CIA:25 Marks	ESE:75 Marks

कोर्स लक्ष्य : छात्र–छात्राओं में राष्ट्रीय भावना का विकास करना तथा राष्ट्रभाषा हिंदी एवं उससे संबंधित साहित्य की जानकारी प्रदान करना

कोर्स परिणाम :

1. सामाजिक, सांस्कृतिक और राजनैतिक परिवेश से छात्र. साहित्य के माध्यम से बोधवान होंगे।
2. व्याकरण के शिक्षण के माध्यम से छात्रों में शुद्ध भाषा में बोलने की क्षमता को विकसित होगी।
3. अंतर्राष्ट्रीय भाषा अंग्रेज़ी से राष्ट्रभाषा हिंदी में सामग्री का अनुवाद करके छात्र हिंदी की ज्ञान संपदा बढ़ाने में कामयाब होंगे।
4. विविध अनुशासनों में अनुवादों को सुचारु बनाने के लिए पारिभाषिक शब्दावली का ज्ञान होगा।

के द्वारा दिया गया अध्ययन विषयवस्तु : हिंदी

निर्देशात्मक घंटे / सप्ताह : 05

इकाई	विवरण	
८	लडाई–सर्वश्वरदयाल सक्सेना	
	निर्देशात्मक घंटे	**20**
८८	एकांकी संग्रह – 1. शिवाजी का सच्चा स्वरूप (सेठ गोविन्ददास) 2. माँ (विष्णु प्रभाकर) 3. घोंसले 4. रीढ़ की हड्डी (जगदीशचन्द्र माथुर) 5. दूसरा दिन (कंचलता सब्बरलाल)	
	निर्देशात्मक घंटे	**20**
८८८	व्याकरण : संज्ञा, सर्वनाम, विशेषण, क्रिया, वचन, लिंग, काल, वाच्य, प्रत्यय, उपसर्ग, 'ने' का प्रयोग	
	निर्देशात्मक घंटे	**15**
८८ट	अनुवाद : अंग्रेज़ी–हिंदी (अनुवाद अभ्यास–3)) 1.15द्ध	
	निर्देशात्मक घंटे	**10**
८ट	पारिभाषिक शब्दावली	

निर्देशात्मक घंटे	10
कुल घंटे	75

पाठ्यपुस्तकरू

1. **लडाई** : सर्वेश्वरदयाल सक्सेना
2. एकांकी संग्रह
3. अनुवाद अभ्यास–3, दक्षिण भारत हिंदी प्रचार सभा, चेन्नै–17.
4. आलेखन व टिप्पणी

संदर्भ ग्रंथ :

1. डॉ. एन.ई. विश्वनाथ अय्यर, अनुवाद कला, पब्लिशर, संस्करण 2000
2. भोलानाथ तिवारी, अनुवाद विज्ञान, संस्करण 2000
3. रामदेव, व्याकरण प्रदीप। प्रकाशन : हिंदी भवन, 36, टागौर टाउन, इलहाबाद –2
4. नूतन गद्य संग्रह, सुमित्रा प्रकाशन, सुमित्रा निवास, 16/4 हास्टिंग्स रोड, इलहाबाद –211 001. संस्करण 2006

आकलन के लिए उपयुक्त अंक ;25 अंकद्ध

सीआईए. r	सीआईए. rr	सीआईए. rr	असाईनमेंट	संगोष्ठी	उपस्थिति	कुल
5	5	6	3	3	3	25

पाठ्यक्रम द्वारा डिज़ाइन किया गया	एच.ओ.डी. द्वारा सत्यापित	के द्वारा जांचा गया	द्वारा अनुमोदित

Course Code	Title		
18U1MAL101	PART-I MALAYALAM -I		
Semester-I	Credit-4	CIA:25 Marks	ESE:75 Marks

Course Objective : ആധുനിക കാലഘട്ടങ്ങളിലെ കഥകളേയും കഥകാരൻമാരേയും കുറിച്ചുള്ള അവബോധം

Course Outcome :

CO1	ചെറുകഥകളും കഥാകാരൻമാരേയും കുറിച്ച് അറിവ് ലഭിക്കുന്നു.
CO2	ഭാഷയുടെ ഉപയോഗക്രമങ്ങളെക്കുറിച്ചുള്ള അറിവ്

Offered by : Malayalam

Course Content **Instructional Hours/Week:5**

Unit	Description	
I	ചെറുകഥകൾ - കഥാമാലിക	
	Instructional Hours	16
II	ചെറുകഥകൾ - കഥാമാലിക	
	Instructional Hours	16
III	ചെറുകഥകൾ - കഥാമാലിക	
	Instructional Hours	16
IV	പ്രായോഗിക മലയാളം	
	Instructional Hours	16
V	ആശയവിപുലനം, പൊതുവായ വിഷയത്തെക്കുറിച്ച് ഉപന്യാസവും വിവർത്തനവും. (ഏകദേശം 100 വാക്കുകൾ)	
	Instructional Hours	11
	Total Hours	75

പാഠപുസ്തകങ്ങൾ

1 ചെറുകഥകൾ കഥാമാലിക (10 ചെറുകഥകൾ)

2. പത്മന രാമചന്ദ്രൻനായർ - നല്ല ഭാഷ - വാസുദേവ ഭട്ടതിരി - നല്ല മലയാളം

സൂചനാഗ്രന്ഥങ്ങൾ

1. എം. അച്യുതൻ ചെറുകഥ - ഇന്നലെ, ഇന്ന് (ഡി.സി. ബുക്സ്, കോട്ടയം)
2. കെ.എം. ജോർജ്ജ് സാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ (ഡി.സി. ബുക്സ്, കോട്ടയം)
3. സുകുമാർ അഴീക്കോട് - മലയാള സാഹിത്യ വിമർശനം (ഡി.സി. ബുക്സ്, കോട്ടയം)
4. എരുമേലി പരമേശ്വരൻ പിള്ള മലയാളസാഹിത്യം കാലഘട്ടങ്ങളിലൂടെ (ഡി.സി. ബുക്സ്, കോട്ടയം)

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U1FRN101	PART – I FRENCH – I		
Semester - I	Credits : 4	CIA: 25 Marks	ESE: 75 Marks

(Common to all UG Programs except B. Sc. Catering Science and Hotel Management)

Course Objective : To make the students know and understand the value of French language and help them to follow the culture and tradition.

Course Outcomes (CO)

CO1	Empowering reading skill
CO2	Translation

Offered by : The French department

Course Content **Instructional Hours / Week : 5**

Unit	Description	
I	Bonjour	
	Instructional Hours	**15**
II	Rencontres	
	Instructional Hours	**15**
III	100 % questions	
	Instructional Hours	**15**
IV	Enquête	
	Instructional Hours	**15**
V	Invitations	
	Instructional Hours	**15**
	Total Hours	**75**

Text Book:

1. **CONNEXIONS 1 Methode de Français Niveau 1** – Régine Mérieux Yves Loiseau

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course designed by	Verified by	Checked by	Approved by

Course Code	Title		
20U2ENG101	Part II- English I		
Semester: I	Credits: 4	CIA: 25	ESE : 75

(Common to all UG Programmes)

Course Objective:

To help students to imbibe, develop, practice and use the LSRW skills and fine tune their productive skills.

Course Outcomes:

CO1	Recognize listening, and reading proficiency through the prose discourses
CO2	Use and interpret imaginative, and creative skills through the poetic genre
CO3	Enhance the students to use English effectively
CO4	Execute and exercise LSRW skills in academic and career
CO5	Evaluate the language skills through literature

Offered by: English **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Prose** Leigh Hunt – Getting Upon Cold Morning Rajagopalachari – Tree Speaks Swami Vivekananda – The Secret of Work	1	1-3
	Instructional Hours		**15**
II	**Poetry** DG Rossetti – The Blessed Damozel Maya Angelou -Phenomenal Women A. K. Ramanujan – A River	1	4-6
	Instructional Hours		**15**
III	**Short Stories** O. Henry –The Last Leaf R. K. Narayan – The Missing Mail Oscar Wilde - The Happy Prince	1	7-9
	Instructional Hours		**15**
IV	**Grammar and Vocabulary** Parts of speech Tenses – Present, past, Vocabulary of the specific domain, Punctuations, Kinds of Sentences.	1	10-13
	Instructional Hours		**15**

V	**Oral & Written Communication** **Listening** : (UNIT I – IV) **Listening** – Comprehension practice from Poetry, Prose, Short-stories, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests and DD National News Live, BBC, CNN, VOA etc **Speaking** – In Group Discussion Forum, speak about Tongue Twisters, Critical Thinking, and Seminar Presentations on Classroom-Assignments, and Peer-Team interactions. **Reading** – Pronunciation practice and enhancement from Poetry, Prose, Short-stories, Magazines, News Paper etc **Writing** – Asking & Giving Directions/Instructions, Developing Hints, and Filling Forms.	1	14-17
	Instructional Hours		**15**
		Total Hours	**75**

Books for study:

Unit I – V : Will be compiled by the PG & Research Department of English

Books for Reference:

1. CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by
V.Shanthi	Dr.R.Malathi		

Course Code	Title		
20U3MCC101	Core Paper I Classical Algebra		
Semester: I	Credit: 4	CIA:25 Marks	ESE:75 Marks

Course Objective:

It enables the students to learn about the convergence and divergence of the series and to find the roots for the different types of the equation.

Course Outcome:

CO1	To remember the Mathematical series - Binomial, Exponential and Logarithmic series
CO2	To analyze the concepts of convergence and divergence
CO3	To evaluate the roots for different types of equations
CO4	To evaluate multiples roots for the given equations
CO5	To understand Diagonalisation of a matrix.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Binomial theorem- statement only- their immediate application to summation and approximation only.	1	3
	Exponential Theorem- statement only- their immediate application to summation and approximation only. Logarithmic series theorem- statement and proof- immediate application to summation and approximation only	1	4
	Instructional Hours		**15**
II	Convergence and Divergence of series-definitions, elementary results-Comparison tests- De Alembert's and Cauchy's tests. Absolute convergence-series of positive terms- Cauchy's condensation test.	1	2
	Instructional Hours		**15**
III	Theory of equations: Transformations of equations- character and position of roots- Symmetric function of roots-Reciprocal equations- Descartes' rule of signs- Multiple roots.	1	6
	Instructional Hours		**15**
IV	Rolle's theorem - position of real roots of f(x)=0 - Newton's Method of approximation to a root- Horner's method	1	6
	Instructional Hours		**15**
V	Matrices: Characteristic roots and characteristic vectors of a matrix – Cayley – Hamilton theorem - Diagonalisation of matrices – Problems.	2	4

Instructional Hours	**15**
Total Hours	**75**

Text Book:

1. T. K. Manicavachasam Pillai, T. Natarajan, K. S Ganapathy, **Algebra**, S.Viswanathan (Printers & Publishers) Pvt.Ltd, 2006

Unit – I : Chapter 3, Section: 1&10, Chapter 4, Section- 1 to 3, 5 to 7

Unit – II : Chapter 2, Section: 13,14,15,16.1,16.2,17,21,22,23,24.

Unit –III : Chapter 6, Section: 1 to 10, 15, 16,24,26.

Unit- IV : Chapter 6, Section: 25, 29.4, 30.

2. P. Kandasamy and Thilagavathy , **Mathematics for B.Sc. Branch I – Vol. II** (For B.Sc-I semester), S. Chand and Company Ltd, New Delhi, 2004.
Unit - V : Chapter 4.

Reference Books:

1. P. Kandasamy and Thilagavathy , **Mathematics for B.Sc. Branch I – Vol. I** (For B.Sc-I semester), S. Chand and Company Ltd, New Delhi, 2004.

2. N.P. Bali , **Algebra**, Laxmi Publications, Reprint 2016.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	L
CO2	H	M	M	L
CO3	M	H	M	L
CO4	H	L	M	L
CO5	H	L	M	L

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCC102	Core Paper II Elements of Calculus		
Semester: I	Credit: 4	CIA :25 Marks	ESE :75 Marks

Course Objective:

To enable the students to learn and gain knowledge about curvatures, Differentiations, Beta functions, Gamma functions and its applications.

Course Outcome:

CO1	To understand the concepts of Differentiation
CO2	To learn the basic concepts of Taylor's series and Lagrange's multiplier
CO3	To understand the concepts of evolutes and envelopes
CO4	To analyze extreme values for functions of two variables
CO5	To evaluate Multiple integrals using Beta and Gamma functions

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Differentiability- successive differentiation- LeibnitzTheorem(Statement only)	1	1
	Limits and continuity – Partial derivatives – Total derivatives – differentiation of implicit functions – Jacobians and properties.	1	2
	Instructional Hours		**15**
II	Taylor's series for functions of two variables – Maxima and Minima for functions of two variables – Lagrange's method of undetermined multipliers.	1	3
	Instructional Hours		**15**
III	Method of Integration- Properties of definite integral – Integration by Parts- Reduction formulae-problems	2	1
	Evaluation of double and triple integrals- Applications to calculations of areas and volumes.	2	5
	Instructional Hours		**15**
IV	Jacobians - Change of order of integration in double integral -Change of variables in double and triple integrals.	2	6
	Instructional Hours		**15**
V	Beta and Gamma Functions -theirproperties, relation between them- Evaluation of Multiple integrals using Beta and Gamma functions	2	7
	Instructional Hours		**15**
	Total Hours		**75**

Text Books:

1. P.Kandasamy&K.Thilagavathy, **Mathematics for B.Sc. – Vol I**, S. Chand and Co, 2004.

2. T.K.Manicavachagom Pillay, S.Narayanan,**CalculusVolume - II, S**.Viswanathan (Printers and publishers) Pvt. Ltd, 2002.

Unit I : Text Book 1, Paper -II,Chapter 1 &2 Pg.No: 159-224

Unit II : Text Book 1, Paper -II,Chapter 3-Full Pg.No: 225-241.

Unit III : Text Book 2, Chapter 1, Sections –11 to 14,Chapter 5, Sections –1 to 5.4

Unit- IV : Text Book 2, Chapter 6, Sections –1.1 to 2.4.

Unit –V : Text Book 2, Chapter 7, Sections –1.1 to 6

Reference Books:

1. P.Kandasamy&K.Thilagavathy, **Mathematics for B.Sc. –Vol II**, S. Chand and Co, 2004.
2. Shanthi Narayanan &J.N.Kapoor , **A Text book of Calculus-**, S. Chand & Co.
3. G. Balaji, Engineering Mathematics – I, G. Balaji Publishers Pvt. Ltd, 3rd Edition , 2015.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	M	L
CO2	H	M	M	L
CO3	M	M	L	L
CO4	M	L	L	L
CO5	H	M	M	L

S - Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCP103	Core Paper III LIBRE OFFICE PRACTICAL		
Semester: I	Credits: 2	CIA: 20 Marks	ESE: 30 Marks

Course Objective:

To enable the students to learn and gain knowledge about Libre Office Suite

Course Outcome:

CO1	Understand the functions of Writer, Calc , Impress, Math and Base
CO2	Create and execute reports using the functions

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

S. No.	List of Programs
1	Prepare an invitation for the College function using Writer operation
2	Prepare a class timetable and perform the following operations using Writer: Inserting the table, Data entry, Alignment of rows and columns, Inserting and deleting the rows and columns and change of table format.
3	Prepare your Resume using Writer operation
4	Use Calc and Math Operations to prepare a mark list of your class (minimum of 5 subjects) and perform the following operations: Data entry, total, average, result and ranking by using arithmetic and logical functions.
5	Draw the different types of charts to illustrate year wise performance of purchase, sales and profit of a company using Calc operation
6	Prepare a statement of bank customers account showing Simple and Compound Interest calculations for 10 different customers using Calc and Math Operations
7	Design Presentation slides for a topic of your choice in Mathematics using Impress component

8	Use Impress operation to design presentation slides for Seminar / Lecture Presentation using animation effects	
9	Create mailing labels for Student database which should include at least three tables and must have at least two fields with the following details: Roll number, Name, Programme, Year, College, address and Phone Number etc. using Base Operation.	
10	Create a Report for the Employee database using Base Operation	
	Total Hours:	**30**

Tools for Assessment of CIA

CIA I	CIA II	Exp	Observation	Attendance	Total
4	**4**	**5**	**4**	**3**	**20**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	L	S	L
CO2	S	M	S	L

S - Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCA101	Allied Paper I Statistics for Mathematics - I		
Semester: I	Credit: 3	CIA:20 Marks	ESE:55 Marks

Course Objective:

To enable the students to learn and visualize the fundamental ideas of statistical methods.

Course Outcome:

CO1	To remember the basic concepts of measures of central tendency and dispersion
CO2	To understand the concepts of correlation and regression
CO3	To calculate probability using Baye' s theorem
CO4	To gain knowledge about Random variables and Mathematical expectation
CO5	To understand the properties MGF and CGF

Offered by : Mathematics

Course Content **Instructional Hours / Week: 5 hrs**

Unit	Description	Text Book	Chapter
I	Measures of Central tendency – Introduction – frequency distribution - Histogram - Frequency polygon - Arithmetic mean - Median - Mode.	1	2
	Measures of dispersion – Range - Quartile deviation - Standard deviation - Coefficient of variation.	1	2
	Instructional Hours		**15**
II	Correlation: Definition – Scatter diagram - Karl Pearson's correlation co-efficient - Rank correlation co-efficient – Properties.	1	10
	Regression: Introduction – Construction of regression equations – Properties.	1	11
	Instructional Hours		**15**
III	Probability: Introduction - Axioms of probability - Conditional probability - Addition theorem - Multiplication theorem - Independent event.	1	3
	Boole's Inequality – Baye's theorem	1	4
	Instructional Hours		**15**
IV	Random variables – Discrete random variables- probability mass function - Continuous random variables – probability density function	1	5
	Mathematical Expectation – Addition and Multiplication theorems - variance – Co-variance.	1	6

	Instructional Hours		**15**
V	Generating Functions - Moment generating and cumulants - Characteristic functions and their properties - Chebyshev's inequality - Weak law of large numbers.	1	7
	Central limit theorem (Statement only)	1	9
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. S.C.Guptha and V.K. Kapoor , **Fundamentals of Mathematical Statistics**, S.Chand and Sons, Reprint, 2006.

Unit I: Chapter 2, Sections: 2.1 to 2.7.1, 2.13 to 2.13.4, 2.14.1
(Omit 2.3, 2.13.3)
Unit II: Chapter10, Sections: 10.2, 10.3, 10.4, 10.7, 10.7.1 to 10.7.3
Chapter11, Sections: 11.1, 11.2

Unit III: Chapter 3, Sections: 3 .1 to 3. 5, 3.7.1 to 3.7.3, 3.8 to 3.13
Chapter 4, Section: 4.2, 4.2.1

Unit IV: Chapter 5, Section: 5.1, 5.3, 5.3.1, 5.4, 5.4.1
Chapter 6, Section: 6.2, 6.4 to 6.6 (simple problems)

Unit V: Chapter 7, Section: 7.1 to 7.3, 7.5, 7.7.1
Chapter 9, Section: 9.13.1 to 9.13.4

Reference Book:

1. P.R.Vittal , **Mathematical statistics**, Margham Publications, Chennai .

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Computation	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	H	H
CO2	H	H	M	M
CO3	H	H	M	M
CO4	H	H	M	M
CO5	H	L	H	M

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
18U4ENV101	Ability Enhancement Compulsory Course - Environmental Studies	
Semester: I	Credit: 2	ESE: 50 Marks

(Common to all UG Programmes)

Course Objective:

This course enables the students to recognize the interconnectedness of multiple factors in environmental challenges and communicate clearly and competently matters of environmental concern.

Course Outcome:

CO 1	To understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
CO 2	To understand concepts and methods from ecological and physical sciences and their application in environmental problem solving.
CO 3	To solve the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
CO 4	To reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
CO5	To apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.

Course Content **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapter
I	**Natural Resources:** Forest resources, Water resources, Mineral resources Food resources and Energy resources.	1	5
	Instructional Hours		**6**
II	**Ecosystems:** Concept of an ecosystem, Structure and function; Introduction, types characteristic features, structure and function of ecosystem **Activity: Prepare an album on types of Ecosystem.**	1	3
	Instructional Hours		**6**
III	**Environmental Pollution:** Definition Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution and Noise pollution, Solid waste management **Activity: Discuss the solutions for water pollution.**	1	8,9,11, 10,12,15
	Instructional Hours		**6**

IV	**Social Issues and the Environment** Water conservation, rain water harvesting, watershed management, Environmental ethics : Issue summits' and possible solutions and Public awareness **Activity: Identify and analyze a Social Issue and an Environment issue in your locality.**	1 2	17 9
	Instructional Hours		**4**
V	**Disaster Management:** Floods, Earthquakes, Cyclones, Landslides: From management to mitigation of disasters: The main elements of a mitigation and measures of strategy: Floods, Earthquakes, Cyclones and Landslides	3	16
	Instructional Hours		**6**
Case Studies: Use Social media for e-networking and dissemination of ideas on environmental issues. (Or) Visit to a Nearby biome / Wildlife Sanctuary/ our own campus & study the various bioresources.			**2**
	Total hours		**30**

Text Book(s):

1. Agarwal,K.M.,Sikdar,P.K.,Deb,S.C. (2002). A Textbook of Environment. Macmillan India Ltd. Kolkata, India.
2. Dash.M.C. (2004). "Ecology, Chemistry & Management of Environmental Pollution". Published By Rajiv Beri For Macmillan India Ltd. 2/10 Ansari Road, Daryaganj, New Delhi – 110002.
3. From UGC website: https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

Reference Book(s):

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
3. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions
4. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
5. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt. Ltd 345 p.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U1TAM202	Language II : Tamil II		
Semester: II	Credit: 4	CIA: 25 Marks	ESE: 75 Marks

(Common to all UG Programmes)

Course Objective :

மொழி இலக்கியத்தின் வாயிலாக அறம்சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்

Course Outcome : பக்தி இலக்கியங்கள் வழி வாழ்வியல் நெறிகள் பெறப்படும்.

Offered by : தமிழ்த்துறை

Course Content **Instructional Hours / Week: 5**

Unit	Description	
I	**பக்தி இலக்கியங்கள்** 1. திருவாசகம் - பிடித்த பத்து பாடல்கள் 1-10 2. நாலாயிர திவ்விய பிரபந்தம் பெரியாழ்வார்(கண்ணன் திரு அவதாரச் சிறப்பு (13 - 22) பாடல்கள்) 3. நாலாயிர திவ்விய பிரபந்தம் தொண்டரடிப் பொடியாழ்வார் திருப்பள்ளியெழுச்சி (1-5 பாடல்கள்) 4. திருவருட்பா- இராமலிங்க அடிகளார் நான்காவது திருமுறை அருள் பிரகாசமாலை 1-10 பாடல்கள்	
	Instructional Hours	**15**
II	**சிற்றிலக்கியங்கள்** 1. கலம்பகம் - நந்திக் கலம்பகம் (91 - 100 பாடல்கள்) 2. பள்ளு - முக்கூடற்பள்ளு (350 - 360) 3. குறவஞ்சி - திருக்குற்றாலக்குறவஞ்சி (1-10) 4. சதகம் - வைராக்கிய சதகம் (1-10) 5. பட்டினத்தார் பாடல்கள் (358-367)	
	Instructional Hours	**15**
III	**நாவல்** கல்மரம் - திலகவதி	
	Instructional Hours	**15**
IV	**இலக்கணம்** 1. வல்லினம் மிகும் இடங்கள் 2. வல்லினம் மிகா இடங்கள் 3. தொகை நிலைத் தொடர் 4. தொகா நிலைத் தொடர்	
	Instructional Hours	**15**
V	**இலக்கிய வரலாறு பாடத்திட்டத்தைத் தழுவியது.** 1. சைவமும் தமிழும் 2. வைணமும் தமிழும் 3. சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 4. புதினத்தின் தோற்றமும் வளர்ச்சியும் 5. விண்ணப்பங்கள், மடல்கள் எழுதச் செய்தல்	
	Instructional Hours	**15**
	Total Hours	**75**

பார்வை நூல்கள்

1. மாணிக்கவாசகர் அருளிய திருவாசகம் - சித்தாந்த பண்டிதர் திரு.ப.இராமநாத பிள்ளை விளக்க உரையுன் கழகக வெளியீடு, திருநெல்வேலி, தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்புக் கழகம் லிமிடெட், 522 டி.டி.கே. சாலை, சென்னை- 600018.
2. புலவர் த.திருவேங்கட இராமானுஜதாசன் - நாலாயிர திவ்வியப் பிரபந்தம் முதல் ஆயிரம் மூலமும் உரையும், உமா பதிப்பகம், 171, புதிய எண்.18 பவளக் காரத் தெரு, மண்ணடி, சென்னை - 600001.
3. தாயுமான திருவருட் பிரகாச வள்ளலார் - திருஅருவட்பா நான்காவது திருமுறை, சகுந்தலை நிலையம், 171, புதிய எண்.18 பவளக் காரத் தெரு, மண்ணடி, சென்னை - 600001.
4. ஆசிரியர் பெயர்தெரியவில்லை - நந்திக் கலம்பகம் - மணிவாசகர் பதிப்பகம், ராஜ வீதி, கோயமுத்தூர் - 641001.
5. முனைவர் கதிர்முருகு - முக்கூடற் பள்ளு மூலமும் உரையும், சாரதா பதிப்பகம், சென்னை.
6. புலியூர்க்கேசிகன் தெளிவுரை - திருக்குற்றாலக் குறவஞ்சி, செல்லப்பா பதிப்பகம், சென்னை.
7. சாந்தலிங்க சாமிகள் - சாந்தலிங்க அடிகளார் திருமடம் வெளியீடு, பேரூர், கோவை-10.
8. அ.மாணிக்கம் உரையாசிரியர் - பட்டினத்தார் பாடல்கள் மூலமும் உரையும், வர்த்தமானன் பதிப்பகம், 40, சரோஜினி தெரு, தியாகராய நகர், சென்னை - 17.
9. திலகவதி - கல்மரம், அம்ருதா பதிப்பகம் எண் 5, 5 வது தெரு, எஸ்.எஸ் அவென்யூ, சக்தி நகர், போரூர், சென்னை - 600116.
10. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை - 625001.
11. நல்ல தமிழ் எழுத வேண்டுமா? - அ.கி.பரந்தாமனார். அல்லி நிலையம், சென்னை - 600007.
12. முனைவர் பாக்கியமேரி - தமிழ் இலக்கிய வரலாறு - NCBH வெளியீடு, கோவை-600098.
13. மு.வ. - தமிழ் இலக்கிய வரலாறு சாகித்திய அகாதெமி, புதுதில்லி - 110001.

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U1MAL202	PART-I MALAYALAM -II		
Semester-II	Credit-4	CIA:25 Marks	ESE:75 Marks

Course Objective : വിദ്യാർത്ഥികളിൽ വായനാശീലം വർദ്ധിഷിക്കുക

Course Outcome :

CO1	മലയാള ഭാഷയുടെ ഉൽപത്തിയേയും വികാസത്തേയും കുറിച്ചുള്ള അറിവ്
CO2	മലയാള സാഹിത്യത്തിൽ നോവലുകൾക്കുള്ള സ്ഥാനം

Offered by : Malayalam

Course Content **Instructional Hours/Week:5**

Unit	Description	
I	നോവൽ – ആടുജീവിതം	
	Instructional Hours	**15**
II	നോവൽ – ആടുജീവിതം	
	Instructional Hours	**15**
III	നോവൽ – ആടുജീവിതം	
	Instructional Hours	**15**
IV	പ്രായോഗിക മലയാളം ഭാഗം 2	
	Instructional Hours	**15**
V	പ്രായോഗിക മലയാളം ഭാഗം 2	
	Instructional Hours	**15**
	Total Hours	**75**

പാഠപുസ്തകങ്ങൾ

1. ബെന്യാമിൻ ആടുജീവിതം (ഗ്രീൻ ബുക്സ്, കോട്ടയം)
2. കേരളപാണിനീയം – ഏ.ആർ. രാജരാജവർമ്മ (ഡി.സി. ബുക്സ്, കോട്ടയം)

സൂചനാഗ്രന്ഥങ്ങൾ

1. പ്രൊ. എൻ. കൃഷ്ണപിള്ള കൈരളിയുടെ കഥ (ഡി.സി. ബുക്സ്, കോട്ടയം)
2. ഡോ. പന്മന രാമചന്ദ്രൻനായർ സമ്പൂർണ്ണ മലയാള സാഹിത്യചരിത്രം (ഡി.സി. ബുക്സ്, കോട്ടയം)
3. ഡോ. കെ.എം. ജോർജ്ജ് – ആധുനിക മലയാള സാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ (ഡി.സി. ബുക്സ്, കോട്ടയം)
4. എരുമേലി പരമേശ്വരൻപിള്ള മലയാള സാഹിത്യം – കാലഘട്ടങ്ങളിലൂടെ (ഡി.സി. ബുക്സ്, കോട്ടയം)

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by

विषय क्रमांक	शीर्षक		
18U1HIN202	भाग–१ हिंदी		
सत्र : १	क्रेडिट : 4	CIA:25 Marks	ESE:75 Marks

कोर्स लक्ष्य : भारतीयता की साहित्य के माध्यम से पहचान कराना। कहानी के माध्यम से समकालीन समय के सच की पहचान कराना। हिंदी से अंग्रेज़ी में अनुवाद के माध्यम से भारतीय ज्ञान संपदा को अंतर्राष्ट्रीय स्तर तक पहुँचाने में छात्र को समर्थ बनाना।दैनन्दिन की बातचीत में हिंदी का निर्बाध प्रयोग करने में छात्र को सक्षम बनाना।

कोर्स परिणाम :

1. छात्रों में साहित्यिक अभिरुचि के साथ सामाजिक बोध बढ़ेगा। पत्राचार के क्षेत्र में वे स्वावलम्बी हो सकेंगे।
2. भारतीय भाषा के ज्ञान को विदेश तक पहुँचाने के क्षेत्र में क्षमता हासिल करेंगे।
3. राष्ट्रभाषा हिंदी से अंतर्राष्ट्रीय भाषा अंग्रेज़ी में सामग्री का अनुवाद करके छात्र हिंदी की ज्ञान संपदा बढ़ाने में कामयाब होंगे।
4. रोज़मरा जीवन में हिंदी को बोल पाने में कामयाब होंगे।

के द्वारा दिया गया अध्ययन विषयवस्तु :हिंदी

निर्देशात्मक घंटे / सप्ताह : 05

इकाई	विवरण	
I	आधुनिक काव्य : रश्मिरथी, रामधारीसिंह दिनकर	
	निर्देशात्मक घंटे	**25**
II	कहानी – 1. पूस की रात (प्रेमचन्द), 2. आकाशदीप (जयशंकर प्रसाद) 3. अकेली (मन्नू भंडारी), 4. खेल (जैनेन्द्र कुमार) 4. सच बोलने की भूल (यशपाल) 5. चीफ की दावत (भीष्म साहनी) 6. आरोहण (संजीव) 7. सलाम (ओमप्रकाश वाल्मीकि)	
	निर्देशात्मक घंटे	**20**
III	पत्र लेखन : (सरकारी पत्र, निजी पत्र, संपादक को पत्र, ज्ञापन, परिपत्र)	
	निर्देशात्मक घंटे	**10**
IV	अनुवाद : हिंदी से अंग्रेज़ी	
	निर्देशात्मक घंटे	**10**

V	बोलचाल हिंदी – 1. साक्षात्कार 2. अध्यापक–विद्यार्थी 3. ग्राहक–दूकानदार 4. डॉक्टर–मरीज 5. मुसाफिर–यात्री	
	निर्देशात्मक घंटे	**10**
	कुल घंटे	**75**

पाठ्यपुस्तक :

1. रामधारीसिंह दिनकर, रश्मिरथी।
2. **कहानी**
3. **अनुवाद अभ्यास–3,** (दक्षिण भारत हिंदी प्रचार सभा)
4. आदर्श पत्र लेखन
5. व्याकरण

संदर्भ ग्रंथ :

1. प्रोफ. नीरज एम., **प्रामाणिक आलेखन और टिप्पणी**, राजपाल एंड सन्स, काश्मीर गेट, नई दिल्ली।
2. नीलम कपूर, **प्रयोजनमूलक हिंदी**, श्री नटराज प्रकाशन, साउथ गारडी, नई दिल्ली–2
3. डॉ. मधुधवन, **नवीन एकांकी संग्रह**, सुमित्रा प्रकाशन, अशोक नगर, अलहाबाद–1

आकलन के लिए उपयुक्त अंक (25 अंक)

सीआईए. I	सीआईए. II	सीआईए. III	असाईनमेंट	संगोष्ठी	उपस्थिति	कुल
5	5	6	3	3	3	25

पाठ्यक्रम द्वारा डिज़ाइन किया गया	एच.ओ.डी. द्वारा सत्यापित	के द्वारा जांचा गया	द्वारा अनुमोदित

Course Code	Title		
20U1FRN202	Part I : FRENCH – II		
Semester: II	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective : To make the students know and understand the value of French language and help them to follow the culture and tradition.

Course Outcome

CO1	Empowering reading skill
CO2	Translation

Offered by : The French Department

Course Content **Instructional Hours / Week : 5**

Unit	Description	
I	À table!	
	Instructional Hours	**15**
II	Rallye	
	Instructional Hours	**15**
III	Chez moi	
	Instructional Hours	**15**
IV	Les Vacances	
	Instructional Hours	**15**
V	Au jour le jour	
	Instructional Hours	**15**
	Total Hours	**75**

Text Book :

1. CONNEXIONS 1 Methode de Français Niveau 1 – Régine Mérieux Yves Loiseau

Tools for assessment (25 marks)

CIA I	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course designed by	Verified by	Checked by	Approved by

Course Code	Title		
20U2ENG202	Part II- English II		
Semester: II	Credits: 4	CIA: 25	ESE : 75

(All UG Programmes)

Course Objective

To equip the students with the Language Skills, Functional usage. Facilitate the insight and taste of Literature

Course Outcome (CO)

CO1	Remember the themes of literary pieces
CO2	Understand the authors context
CO3	Comprehend the writing skills and practice it
CO4	Enhance fluency over language with self confidence.
CO5	Assess the language skills using literature

Offered by: English **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Prose** Learning the Game - Sachin Tendulkar Women Not the Weaker Sex – Mahatma Gandhi The fun they had – Issac Asimov	2	
	Instructional Hours		**15**
II	**Poetry** Stopping by Woods on a Snowy Evening – Robert Frost A Poison Tree – William Blake The Village School Master – Oliver Goldsmith	2	
	Instructional Hours		**15**
III	**Short Stories** The Cat and the Pain Killer – Mark Twain The Envious Neighbour – Japanese Folk Tale Karma – Khushwanth Singh	1	
	Instructional Hours		**15**
IV	**Grammar** Active and Passive Voices Direct and Indirect Speech Sentence Connectors and Linkers	1	
	Instructional Hours		**15**
V	**Oral & Written Communication (Unit I –IV)** **Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc	2	

	Speaking – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending/Mock Viva-Voice, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions. **Reading** – Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc **Writing**– Dialogue/Conversation Writing, Advertisement Writing, and Creative Writing (autobiography, article etc,) for publication in Mass Media.	
	Instructional Hours	**15**
	Total Hours	**75**

Books for study:

Unit I – V : Will be compiled by the PG & Research Department of English

Books for Reference:

1. CLIL (Content & Language Integrated Learning) – Module by TANSCHE
   NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Assignments	Seminars	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	M	H	H
CO3	H	M	M	M	M
CO4	H	M	M	H	M
CO5	S	H	M	M	M

S: Strong, H: High, M: Medium, L: Low

Course Designed by	Verified by HOD	Checked by	Approved by
D.Pradeek	Dr.R.Malathi		

Course Code	Title		
20U3MCC204	Core Paper IV Analytical Geometry and Trigonometry		
Semester: II	Credit: 4	CIA : 25 Marks	ESE : 75 Marks

Course Objective:

To enable the students to learn and visualize the fundamental ideas about co-ordinate geometry.

Course Outcome:

CO1	To understand the fundamentals of Straight lines.
CO2	To apply the concepts of geometrical aspects of three dimensional figures sphere, cone and cylinder.
CO3	To evaluate the problems on right circular cylinder.
CO4	To understand the concepts of Trigonometric and Hyperbolic functions.
CO5	To know the concepts of Logarithm of a complex number and to find the sum of Trigonometric series.

Offered by: Mathematics

Course content **Instructional Hours / Week: 6hrs**

Unit	Description	Text Book	Chapter
I	**Analytical geometry of three dimensions**: Straight lines- Coplanarity of straight lines- Shortest distance (S.D) and Equation of S.D between two lines-simple problems.	1	4
	Instructional Hours		**18**
II	**Sphere:** Standard equation of sphere – results based on the properties of a sphere- Tangent plane to a sphere – Projection of a sphere.	1	5
	Instructional Hours		**18**
III	**Cone and Cylinder:** Cone whose vertex is at the origin- Enveloping cone of a sphere-right circular cone- Equation of a cylinder-right circular cylinder.	1	6
	Instructional Hours		**18**
IV	**Trigonometry :** Expansion of Cos nφ, Sin nφ, $\text{Cos}^{n}\varphi$, $\text{Sin}^{n}\varphi$	2	3
	Hyperbolic functions - Separations of real and imaginary parts of Trigonometric and Hyperbolic function- Inverse trigonometric function.	2	4
	Instructional Hours		**18**
V	**Logarithmic functions :** Logarithm of a Complex number	2	5
	Summation of Trigonometric Series	2	6
	Instructional Hours		**18**
	Total Hours		**90**

Text Books:

1. P. Durai Pandian & others, **Analytical Geometry**, Emerald Publishers**,** Reprint 2003.
2. T. K. Manikavachagam Pillay, S.Narayanan**; Trigonometry**, S.Viswanathan (Printers & Publications) Pvt.Ltd, New Delhi , Reprint (2011)

Unit I : Text Book 1, Chapter 4

Unit II : Text Book 1, Chapter 5

Unit III: Text Book 1, Chapter 6, Sections – 6.1 to 6.8

Unit IV: Text Book 2, Chapter 3 and 4

Unit V : Text Book 2, Chapter 5, Section 5

Chapter 6, Sections 1 to 3

Reference Books:

1. T.K.M. Pillay and Others, **A Text Book of Analytical Geometry 3D**, Visvanathan Publications, 2007.
2. N. P. Bali, **Solid Geometry**, Laxmi Publications (P) Ltd.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	M	M
CO2	H	H	M	M
CO3	H	H	M	M
CO4	H	H	M	M
CO5	H	H	L	M

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCC205	Core Paper V Programming in C		
Semester: II	Credit: 3	CIA:20 Marks	ESE:55 Marks

Course Objective:

This course presents the importance of C language, its Structure, Data types, Operators of C, various control statements, Arrays, Different types of functions and practical problems

Course Outcome:

CO1	To remember the basic structure and data types of C.
CO2	To understand the functions of arithmetic operators and expressions.
CO3	To create C program using decision making, branching and looping.
CO4	To know the basics of array and its application in string handling functions.
CO5	To create simple C program using user defined functions.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

Unit	Description	Text Book	Chapter
I	Introduction – Importance of C – Basic structure of C Program	1	1
	Character set - Constants – Keywords and Identifiers – Variables - Data types – Declaration of Variables – Assigning values to Variables –Defining Symbolic Constants.	1	2
	Instructional Hours		**9**
II	Arithmetic Operators - Relational Operators - Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators - Special Operators	1	3
	Arithmetic Expressions –Evaluation of Expressions – Precedence of arithmetic operators – Some Computational problems –Type conversion in Expressions – Operator Precedence and Associativity - Mathematical Functions.	1	3
	Instructional Hours		**9**
III	Reading and Writing Character – Formatted input and output.	1	4

	Decision Making and Branching: Decision Making with IF statement – Simple IF statement – The IF ELSE statement - Nesting of IF…..ELSE statement – The ELSE IF ladder. The Switch statement –The?: Operator –The GOTO statement.	1	5
	Decision Making and Looping: The WHILE statement - The DO statement- The FOR statement –Jumps in Loops.	1	6
	Instructional Hours		**9**
IV	One, Two Dimensional arrays – Declaring and Initializing one and two dimensional arrays – Multidimensional arrays	1	7
	Declaring and initializing string variables – Reading strings from Terminal – Writing strings on the screen – Arithmetic operations on characters – Comparison of two strings – String-handling Functions.	1	8
	Instructional Hours		**9**
V	Need for user-defined function-Elements of user- defined Functions - Definition of a function-Return values and their Types- Function calls-Function declaration-Category of Function-Nesting of functions-Recursion.	1	**9**
	Instructional Hours		**9**
	Total Hours		**45**

Text Book:

1. E. Balagurusamy, **Programming in ANSI C**, Tata McGraw –Hill Publishing company limited, New Delhi, Fourth Edition, 2004

Reference books :

1. Byron Gottfried, **Programming with C**, Schaum's outlines, Tata McGraw – Hill-Publishing Company limited, Second Edition, 2001

2. Ashok N. Kamthane, **Programming with ANSI and Turbo C,** Dorling Kindersley India Pvt. Ltd., 2008

3. Gary J. Bronson, **ANSI C Programming**, Cenage learning India Pvt. Ltd., New Delhi, 2008

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Programming skill	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	M	H
CO2	H	M	M	M
CO3	L	H	H	H
CO4	L	H	H	H
CO5	H	H	H	M

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCP206	Core Paper VI C Programming Practical		
Semester: II	Credit: 2	CIA:20 Marks	ESE:30 Marks

Course Objective:

To enable the students to apply the basic structure, Statements, arrays, functions and various concepts of C language to create C programs

Course Outcome:

CO1	To solve the mathematical problems using arrays and functions.
CO2	To evaluate the Statistical values of the given data.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

S. No.	Program list
1	Write a C program to generate N Fibonacci numbers.
2	Write a C program to find the factorial of a given Number.
3	Write a C program to print all possible roots for a given quadratic equation.
4	Write a C program to verify whether the given three points are in a straight line.
5	Write a C program to check whether the given triangle is an isosceles triangle.
6	Write a C program to calculate the angle between two planes.
7	Write a C program to calculate the Statistical values of mean, median, mode, Standard Deviation and variance of the given data
8	Write a C program to find the product of two given matrix.
9	Write a C program to find the correlation co-efficient between two variables.
10	Write a C program to find whether the given string is Palindrome or not.

11	Write a C program to find the regression equation of the given data.	
12	Write a C program to find whether the given Sphere and Plane is tangent or not.	
	Total Hours:	**45**

Tools for Assessment (20 Marks)

CIA I	CIA II	Program Execution	Creativity	Observation	Attendance	Total
4	**4**	**3**	**3**	**3**	**3**	**20**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCA202	Allied Paper II Statistics for Mathematics - II		
Semester: II	Credit: 3	CIA:20 Marks	ESE:55 Marks

Course Objective: This course introduces Applied Statistical concepts and Mathematical Analysis.

Course Outcome:

CO1	To remember the concept of Sampling
CO2	To understand the concepts of Estimation and Testing of hypothesis
CO3	To understand the concepts Design of Experiments
CO4	To analyze different statistical situation using Sampling techniques
CO5	To gain the knowledge about Estimation theory

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Large Sample Theory-Concept of population, sample, statistics, parameter-Types of Sampling-Tests of Significance-Procedure for testing of hypothesis-Tests of significance for Large samples- Confidence Interval-Related Problems.	1	14
	Instructional Hours		**15**
II	Exact Sampling Distributions- Exact tests based on Chi square- Related Problems.	1	15
	Exact tests based on t and F- Distributions- Confidence Interval- Related Problems.	1	16
	Instructional Hours		**15**
III	Theory of Estimation -concept of point estimation - Consistency, Unbiasedness, Efficiency and sufficiency- Neyman factorization theorem- Cramer Rao inequality.	1	17
	Instructional Hours		**15**
IV	Methods of Estimation – Method of Maximum likelihood, Method of Moments and Method of Minimum Chi-squares. Confidence interval and Confidence limits.	1	17
	Optimum test under different situations- Neyman Pearson lemma.	1	18
	Instructional Hours		**15**
V	Analysis of Variance - One way, Two way classifications-Related Problems.	2	5

Experimental Designs.	2	6
Instructional Hours		**15**
Total Hours		**75**

Text Books:

1. S.C. Gupta and V.K. Kapoor , **Fundamentals of Mathematical Statistics**, Sultan Chand & Sons, Reprint 2006. (Unit I-IV)

Unit I : Chapter 14

Unit II : Chapter 15, Sections: 15.6.1 to 15.6.4

Chapter 16, Sections: 16.3.1 to 16.3.3 and 16.6.1

Unit III : Chapter 17, Sections: 17.1-17.3 and 17.5

Unit IV : Chapter 17, Sections: 17.6.1, 17.6.3, 17.6.4 and 17.7
Chapter 18, Sections: 18.4 and 18.5 (Theorem alone)

2. S.P. Gupta, **Statistical Methods**, Sultan Chand & Sons, Reprint 2014.(Unit V)

Unit V : Chapter 5
Chapter 6

Reference Book:

1. S.C. Gupta and V.K. Kapoor , **Fundamentals of Applied Statistics** , Sultan Chand & Sons, Reprint 2016.
2. D.C. Sancheti and V. K. Kapoor, Statistics (Theory, Methods and Applications), Sultan Chand & Sons, Reprint 1999

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	L	H	L	L
CO2	H	H	M	H
CO3	L	H	L	H
CO4	L	H	M	L
CO5	L	L	M	L

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
18U4HRC202	Ability Enhancement Compulsory Course - Human Rights and Constitution of India	
Semester: II	Credit: 2	ESE: 50 Marks

Offered by:

Course Content **Instructional Hours / Week: 2**

Unit	Description	
I	**Human Rights and Conceptual Background of Human Rights** Definition, Meaning Inherent, inalienable, Universal, indivisible Values: Dignity, liberty, equality and justice.	
	Instructional Hours	**6**
II	**Philosophical and Historical Perspectives** : Theories of Human Rights -Human Rights Movements- History of Human Rights Civilization	
	Instructional Hours	**6**
III	**HR for target population**: Refugees, War victims, Prisoners, Custodial Violence Women and Children, Senior Citizens.	
	Instructional Hours	**6**
IV	**Human Rights and Duties in India Evolution** : Independence Movement , Making of the constitution Indian Constitution : Fundamental Rights –directive Principles – Fundamental Duties.	
	Instructional Hours	**6**
V	Enforcement and Protection Mechanism of Human Rights in India. Judiciary, National Human Rights Commission and other Commissions and Committees. Non-Governmental Organizations, Information Media and Education.	
	Instructional Hours	**6**
	Total Hours	**30**

Text Book:

1. **"Human Rights and Constitution of India",** complied by the Department of Social Work, Nehru Arts and Science College.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U4HVY201	Human Excellence – Human Values and Yoga Practice I		
Semester: I & II	Credit: 2	CIA: 25 Marks	ESE: 25 Marks

(Common to all UG programmes)

Course Objective:

- To help the students appreciate the essential complementarily between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings
- To prepare and distribute standardized Yoga teaching and training materials with reference to institute health

Course Outcome (CO):

At the end of the course, students are expected

CO 1	To inculcate in students, a sense of respect towards harnessing values of life and spirit of fulfilling social responsibilities.
CO 2	To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening.
CO 3	To inculcate cultural behavioral patterns
CO 4	To understand physical body and Health concepts

Course Content **Instructional Hours / Week: 1**

Unit	Description	
I	**Human Values -** Introduction-Definition of Ethics and Values - Character and Conduct - Nature and Scope of Ethics.	
	Instructional Hours	**6**
II	**Individual and Society -** Theories of Society-Social Relationships and Society-Empathy: Compassion towards other being -Environmental Ethics and Nature.	
	Instructional Hours	**6**
III	Cultural Education - Purity India - Patriotism - Time management. Greatness of Womanhood - Food is medicine- Individual peace -World Peace.	
	Instructional Hours	**6**
IV	Power of Meditation- Development of mind in stages - Mental Frequencies - Methods for Concentration. Meditation Practices - Surya namaskar.	
	Instructional Hours	**6**
V	Simplified Physical Exercise – Kayakalpa Practices - Training for Potentialising the Mind.	
	Instructional Hours	**6**
	Total Hours	**30**

Textbook:

1. **"Value Education",** compiled by Centre for Human Excellence, Nehru Arts and Science College.

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	**Verified by HOD**	**Checked by**	**Approved by**

Course Code	Title		
19U3MCC307	Core Paper VII Modern Algebra		
Semester:III	Credits: 4	CIA:25 Marks	ESE:75 Marks

Course Objective:

It enables the students to understand the concepts of Sets, Groups and Rings.

Course Outcome:

CO1	To remember the basic ideas of group and its properties.
CO2	To classify the sub groups into cyclic and normal subgroups.
CO3	To analyze homeomorphism and automorphism of a Group
CO4	To understand the concepts of rings and integral domain.
CO5	To learn about ideals and their properties.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Sets – Mappings – Integers- Groups: Abelian group, Symmetric group - Definitions and Examples – Lemma.	1	1,2
	Instructional Hours		**15**
II	Subgroups – Cyclic subgroup - Index of a group – Order of an element- Fermat theorem - A Counting Principle - Normal Subgroups and Quotient Groups.	1	2
	Instructional Hours		**15**
III	Homeomorphism – Cauchy's theorem for Abelian groups – Sylow's theorem for Abelian groups Automorphism- Inner automorphism – Cayley's theorem.	1	2
	Instructional Hours		**15**
IV	Rings: Definition and Examples –Some Special Classes of Rings- Commutative Ring – Field– Integral domain - Homeomorphism of Rings.	1	3
	Instructional Hours		**15**
V	Ideals and Quotient Rings – More Ideals and Quotient Rings- Maximal ideal- The field of Quotients of an Integral domain-Euclidean Ring- Unique Factorization Theorem.	1	3
	Instructional Hours		**15**
	Total Hours		**75**

Text book:

1. I.N. Herstein, **Topics in Algebra**, John Wiley & Sons, New York, 2003.

Unit – I : Chapter 1, Section- 1.1 to 1.3, Chapter 2, Sections 2.1 to 2.3

Unit – II : Chapter 2, Sections – 2.4 to 2.6

Unit –III : Chapter 2, Sections – 2.7 to 2.10

Unit- IV : Chapter 3, Sections – 3.1 to 3.3

Unit –V : Chapter 3, Sections – 3.4 to 3.7

Reference Books:

1. S.Arumugam& A.Thangapandi Issac, **Modern Algebra**, Scitech publications (India) Pvt.Ltd, Chennai,edition 2007.

2. A.R.Vasishtha, **Modern Algebra** , Krishna Prakashan Mandir, Meerut, 1994 - 95.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	H
CO2	H	M	H	M
CO3	M	M	H	H
CO4	M	H	H	M
CO5	H	H	M	M

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCC308	Core Paper VIII Differential Equations and Laplace Transforms		
Semester:III	Credits: 4	CIA:25 Marks	ESE:75 Marks

Course Objective:

This course is aimed to provide an adequate knowledge for the students to learn the method of solving Differential Equations and Laplace Transforms along with the solution of Linear Ordinary Differential Equations by Laplace Transforms.

Course Outcome:

CO1	To solve First order and Second order Ordinary Differential Equations with constant coefficients.
CO2	To analyze the Simultaneous Linear Differential Equations with constant coefficients and Method of Variation of Parameters.
CO3	To evaluate Partial Differential Equations.
CO4	To understand the concepts of Laplace Transforms and its Properties.
CO5	To apply the concept of Inverse Laplace transforms to solve Ordinary Differential Equations with constant coefficients.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Ordinary Differential Equations:** Equations of the First Order first degree and of Degree Higher than one – Solvable for p, x, y – Clairaut's Equation.	1	1
	Finding the solution of Second and Higher Order with constant coefficients and undetermined co-efficients.	1	2
	Instructional Hours		**15**
II	**Non Homogeneous Second Order Differential Equations**-Variation of Parameters- Euler's form.	1	2
	System of linear Differential Equations with constant coefficients	1	3
	Instructional Hours		**15**
III	**Partial Differential Equations:** Formation of equations by eliminating arbitrary constants and arbitrary functions – Solutions of Partial Differential Equations by direct integration – Methods to solve the first order Partial Differential Equations in the standard forms – Lagrange's Linear Equations.	1	4
	Instructional Hours		**15**

IV	**Laplace Transforms :** Definition – Laplace Transforms of standard functions – Linearity property – First Shifting Theorem – Transform of *t f(t), f(t)/t, f'(t), f''(t)* - Inverse Laplace Transforms.	1	5
	Instructional Hours		**17**
V	**Application of Laplace Transforms-**Convolution theorem- Applications to solutions of Differential Equations with constant coefficients	1	5
	Instructional Hours		**13**
	Total Hours		**75**

Text Book:

1. S. Narayanan and T.K. Manickavasagam Pillai, **Calculus**, S. Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai, 1991.

Unit – I : Chapter 1, Sections – 5, 6 (Pg. 33 -38)
Chapter2, Sections -1 to 4 (Pg. 47-75)
Unit – II : Chapter 2, Section – 8 (Pg. 81 -89)
Chapter 2, Section – 10 (Pg. 91 -95)
Chapter 3 , Section -6 (Pg. 103 -107)
Unit –III : Chapter 4, Sections –1 to 5.4, 6 (Pg.115 -134 and 138-145)
Unit- IV : Chapter 5, Sections - 1, 2, 4 (Pg.154 -162 and 165-171)
Unit –V : Chapter 5, Sections – 6, 7, 8 (Pg.174 -189)

Reference Books:

1. P. Kandasamy, K.Thilagavathi, **Mathematics for B.Sc., – Branch – I Volume III**, S. Chand and Company Ltd, New Delhi, 2004.
2. N.P. Bali, **Differential Equations**, Laxmi Publication Ltd, New Delhi, 2004
3. Dr. J. K. Goyal and K.P. Gupta, **Laplace and Fourier Transforms**, Pragali Prakashan Publishers, Meerut, 2000.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	M
CO2	H	M	H	M
CO3	H	M	H	M
CO4	M	M	H	M
CO5	H	M	M	H

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCC309	Core Paper IX Introduction to Data Science with R Programming		
Semester: III	Credits: 3	CIA:20 Marks	ESE:55 Marks

Course Objective:

To enhance Career opportunities for students and to provide an Overview of Data Science and "R" Programming to carry out Big Data Analytics.

Course Outcome:

CO1	To understand the basic concepts of R Programming.
CO2	To calculate various Statistical measures using R Programming.
CO3	To evaluate Multi Linear Regression using ANOVA
CO4	To know the basic concepts of Data Science.
CO5	To gain the knowledge of Big Data

Offered by : Mathematics

Course Content **Instructional Hours / Week: 4**

Unit	Description	Text Book	Chapter
I	**Exploring R Basics:** Introduction- Getting started-R studio-R basic data types-R operators- R objects-Vectors-list, arrays-Matrix- factors-Data frame- Data Visualization in R- Exploratory data Analytics- Lattice package- Data sets- Different types of diagrams in Statistics.	2	3,4
	Instructional Hours		**12**
II	**Statistical Measures**: Introduction – Understanding data distribution – Use cases – Measures of central Tendency- Mean- Median-Mode – GM - HM-Measures of Variability - Standard deviation-Probability distributions- Binomial - Poisson – Normal.	2	5
	Instructional Hours		**12**
III	**Regression Analysis**: Data types of regression – Linear regression - Inferential Analysis - Residuals and coefficients - plot Diagnostics - Multi linear regression using ANOVA.	2	6
	Instructional Hours		**12**
IV	**Introduction to data science** - Data Evolution: Data Development - Time Line – ICT Advancements- Data	1	1

	Growth- IT Components-Business Process-Landscape-Data to Data Science- Data Classification – Data analytics- Relation –Data Science, analytics and Big data Analytics.		
	Instructional Hours		**12**
V	**Data Science Components:** Data Engineering- Data Analytics – Methods and Algorithms- Data Visualization- Big data Technology- Data science user-roles and skills-Big data road map- Digital data- an imprint- evolution of Dig data, What is Big data?, sources of Big data- Characteristics of Big data- Data discovery – traditional Approach.	1	1
	Instructional Hours		**12**
	Total Hours		**60**

Text Books:

1. V. Bhuvaneswari**, Data Analytics with R Step by Step,** Lean Publishers,2016.
   Unit I : Chapter 3, 4 Pg no. 21 - 65
   Unit II : Chapter 5 Pg no. 83 to 130
   Unit III : Chapter 6 Page No. 107 to 115
2. V. Bhuvaneswari, T. Devi, **Big Data Analytics: A Practitioner's Approach**, Department of Computer Applications, Bharathiar University, 2016.
   Unit IV : Page No. 1 – 13
   Unit V : Page No. 14-25

Reference Books:

1. Norman Matloff , **The Art of R Programming**, No Starch Press , 2011.
2. Michael J. Crawle, **The R Book** , Wiley, 2008.
3. M. John, **Statistical Analysis with R**, Tata McGraw Hill Publishing Co. Ltd, October 2010.
4. Richard Cotton, **Learning R**, O'Reilly Media, September 2013.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	M
CO2	H	H	H	M
CO3	H	H	M	L
CO4	M	L	M	M
CO5	H	H	M	M

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCP310	Core Paper X - R Programming Practical		
Semester: III	Credits: 2	CIA:20 Marks	ESE:30 Marks

Course Objective:

To enable the students to write queries and create reports from the database using R Programme.

Course Outcome:

CO1	Extract data from files and other sources and perform various data manipulation tasks on them.
CO2	To code Statistical functions in R and apply it in real time applications.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

S. No	List of Programs
1.	Creating Vectors, Matrices, Factors and plotting. graphs
2.	Import Data, copy data from Excel to R.
3.	Work with variables and Data in R
4.	Use Logic statements
5.	Draw Bar charts and pie charts.
6.	Draw Histograms in R
7.	Calculate Mean, Standard Deviation, Frequencies, and t-Test.
8.	Test significant difference between the variance using ANOVA.
9.	Perform Chi-Square test
10.	Calculate Correlation coefficient between two variables.
11.	Fit Regression equation for the given set of values.
	Total Hours **30 Hrs**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
3	3	4	4	3	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3PYA303	Allied Paper III Physics - I		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective:

To enable the students in order to learn the basic principles, theory and concepts of matters, sound and mechanics.

Course Outcome:

CO1	Relate motion of bodies and sound waves
CO2	Acquire basic knowledge of mechanics, properties of matter and gravitation
CO3	Gain basics the conservation of rotational motion
CO4	To understand basic of optics
CO5	Understood basic electronic components and its characterization

Offered by: Physics

Course Content **Instructional Hours / Week: 4**

Unit	Description	Text Book	Chapter
I	**Mechanics:** Simple harmonic motion, phase-equations of wave motion-compound pendulum-center of suspension-interchangeability center of oscillation and suspension-Moment of Inertia –Radius of gyration – Angular Momentum –torque –Theorems of M.I -M.I. of uniform rod, disc, circular ring, solid sphere – Kinetic energy of rotating energy-Acceleration of a body rolling down on an inclined plane.	1	9
	Instructional Hours		**12**
II	**Gravitation and Elasticity:** Law of gravitation– constant G -Kepler's laws-relation between G and g – earth's mass and density -variation of the acceleration due to gravity –orbital velocity -escape velocity -types of modulii -Poission's ratio relation between y, n & bending of beams -bending moment –cantilever cantilever loaded at one end-supported at two ends and	3	10

	loaded in the middle.		
	Instructional Hours		**12**
III	**Sound:** Transverse waves –velocity along a stretched string-laws of transverse vibration of strings-verification of laws-Melde's experiment-ultrasonics-generation -piezo-electric effect--detection of ultrasonics-applications-determination of velocity of sound in a liquid.	2	4
	Instructional Hours		**12**
IV	**Optics:** Defects in images -chromatic aberration-spherical aberration-Determination of refractive index using spectrometer -Newton's rings-Nicol prism – double refraction	5	6
	Instructional Hours		**12**
V	**Basic Electronics:** semi conductors -intrinsic and extrinsic types -p-n junction-forward bias, reverse bias-characteristics - Zener diode, tunnel diode, photo diode, LED -transistor-CE and CB characteristics-transistor amplifier.	4	3
	Instructional Hours		**12**
	Total Hours		**60**

Text Books:

1. D.S. Mathur **, Elements of Properties of Matter** –, Chand and Co, 4th Edition, 2006.
2. Brij lal. and N. Subramaniam, **Text Book of Sound** -S Chand & Co Co,New Delhi, 2nd Edition, 2008.
3. Murugesan. R, **Properties of Matter**, S Chand & Co,New Delhi, 4th Edition,2003.
4. V.K. Mehta, **Principles of Electronics**, S.Chand and CompanyLtd. 3rd Edition, 2009.
5. Murugeshan R. and Kiruthiga Sivaprasath Er. **Modern Physics.** S Chand and Co, New Delhi, 3rd Edition, 2008.

Reference Books:

1. Murugesan, **Mechanics, Properties of matter and sound, Thermal Physics** ,2002.
2. Brij lal. and N. Subramaniam , **Properties of Matter**, S Chand & Co,New Delhi.2003.
3. B.S. Mathur, **Mechanics** - S. Chand and Co, 3rd Edition, 2006.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	OBE Evaluation – Tool 01 Assignment	OBE Evaluation – Tool 02 Seminar	Attendance	Total
4	4	5	2	2	3	2

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	L
CO2	H	H	M	H	M
CO3	H	M	H	M	H
CO4	H	H	H	H	H
CO5	M	H	H	H	H

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U4MCZ301	Skill Based Paper I PSPP – Practical		
Semester: III	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective:

To prepare the students for solving a variety of Statistical Problems using Statistical Packages .

Course Outcome:

CO1	To analyze and step out the algorithm to solve the problem
CO2	To design programs for various Statistical problems using PSPP.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

S. No	List of Programs
1.	Introduction to PSPP – Creation of Data Files in PSPP
2.	Diagrammatic Representation: Bar Chart, Histogram and Pie Chart
3.	Measures of central tendency (Discrete case)
4.	Measures of central tendency (Continuous case)
5.	Measures of dispersion
6.	t-Test: Single Mean
7.	t-Test Difference between two Sample means
8.	Paired t-Test
9.	Comparison of two or more means – one way ANOVA
10.	Chi-Square test: Goodness of Fit
11.	Chi-Square test: Independence of Attributes
12.	Correlation Co-efficient – Karl-Pearson and its Significance
13.	Spearman - Rank Correlation
14.	Regression: Simple Linear Regression
	Total Hours 45 Hrs

Tools for Assessment (30 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
5	5	5	5	7	3	30

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4NM3BT1	BASIC TAMIL - I அடிப்படைத் தமிழ் - I	
Semester: III	Credit: 2	CIA: 50 Marks

Course Objective:

தமிழ் மொழியைக் கற்பித்தல் - மொழித்திறனை வளர்த்தல்.

Course Outcome :

CO1	தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாடு.
CO2	பிறமொழி கற்றல் ஆர்வம் தூண்டல்.
CO3	பிறமொழி அறிவுத் திறன் மேம்படச் செய்தல்.
CO4	வார்த்தை அமைக்கும் திறன் பெறச் செய்தல்.
CO5	கையெழுத்துத் திறன் பெறச் செய்தல

Offered by: **Tamil**

Course Content Instructional Hours / Week: **2**

Unit	Description	Text Book	Chapter
I	தமிழ் மொழியின் அடிப்படைக் கூறுகள்		
	எழுத்துக்கள் - உயிர்எழுத்துக்கள் மெய் எழுத்துக்கள் உயிர்மெய் எழுத்துக்கள்		
	Instructional Hours		**05**
II	சொல் அமைத்தல்		
	1. ஓர் எழுத்துஒருமொழி 2. இரண்டு முதல் ஐந்து எழுத்துச் சொற்கள் 3. தமிழ் மாதங்கள் பெயர்,கிழமைகளின் பெயர் 4. வண்ணங்கள் பெயர், 5. சொல் ஆக்கம்		
	Instructional Hours		**10**
III	தொடரமைப்பு		
	1. எழுவாய் 2. செயப்படு பொருள் 3. பயனிலை		
	Instructional Hours		**05**
IV	குறிப்பு எழுதுதல்		
	1. தொடரமைப்பு 2. பத்திஅமைப்பு		
	Instructional Hours		**05**
V	பிழை நீக்குதல்		
	1. ஒற்றுப்பிழை 2. வாக்கியப் பிழை		

Instructional Hours	**05**
Total Hours	30

பாடத்தொகுப்பு:

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல் அரிச்சுவடி
தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.

Tools for Assessment (25 Marks)

CIAI	CIA II	Model	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4NM3AT1	ADVANCED TAMIL – I (சிறப்புத்தமிழ் - I)	
Semester: III	Credit: 2	CIA: 50 Marks

Course Objective:

புதுககவிதை உருவாக்கும் திறன் வளர்த்தல் - மொழித்திறனை மேம்படுத்துதல்.

Course Outcome :

CO1	கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல.
CO2	படைப்பாக்கத திறன் அறிவுபெறச செய்தல்.
CO3	தகவல் தொடர்பியலுக்கான கடிதம, அமைவுத்திறன் பெறச செய்தல
CO4	மொழியைப் பிழையின்றிப் பேச,எழுதும திறன்பெறச் செய்தல
CO5	இலக்கியச சுவை உணரச செய்தல்.

Offered by: **Tamil**

Course Content Instructional Hours / Week: **2**

Unit	Description	Text Book	Chapter
I	புதுக்கவிதை		
	1. பாரதியார் - புதுமைப்பெண் 2. பாரதிதாசன் - இருண்டவீடு		
	Instructional Hours		**10**
II	பிழை நீக்குதல்		
	1. வார்த்தைப் பிழை நீக்கம 2. தொடர் பிழைநீக்கம 3. பத்தி எழுதச் செய்தல		
	Instructional Hours		**05**
III	இலக்கணப் பயிற்சி அளித்தல		
	1. தொகைநிலைத் தொடர் ,தொகாநிலைத்தொடர் 2. ஆகுபெயர், ஆகுபெயர் வகைகள		
	Instructional Hours		**05**
IV	கடிதம் எழுதுதல்		
	1. பாராட்டுக கடிதம் 2. நன்றிக்கடிதம 3. அழைப்புக கடிதம 4. அலுவலகக் கடிதம		
	Instructional Hours		**05**
V	இலக்கிய வரலாறு		
	1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும 2. பாரதியார் - குறிப்புவரைக. 3. பாரதிதாசன் - குறிப்புவரைக.		
	Instructional Hours		**05**
	Total Hours		30

NOTE: *Distribution of Marks: Theory 100 %*

பாடத்தொகுப்பு:

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல " திரட்டு" தமிழ்த்துறை.

தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.

பார்வை நூல்கள்

1. பாரதியார் - பாரதியார்கவிதைகள்,அபிராமிபதிப்பகம், 7- பி,கொடிமரத் தெரு,சென்னை □ 013
2. பவணந்திமுனிவர் □ நன்னூல் பூலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்னை 040
3. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை □ 001.
4. அ.கி. பரந்தாமனார் □ நல்ல தமிழ் எழுதவேண்டுமா? அல்லி நிலையம், செனனை □ 600 007.
5. கா..கோ.வேங்கடராமன் - தமிழ் இலக்கிய வரலாறு தமிழ்மண் பதிப்பகம் - நாமக்கல்.
6. மாணவர் தமிழ் இலக்கணம் - புலவர்.கவியழகன், எம்.ஏ.,சூடாமணிபிரசுரம், சென்னை □ 083.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4NM3CAF	Non Major Elective : Consumer Affairs	
Semester: III	Credits : 2	ESE: 50 Marks

Course Outcome:

CO1	Know their rights and responsibilities as a consumer
CO2	Gain knowledge about Legal framework of protecting consumer rights
CO3	Understand the procedure about redressal of consumer complaints
CO4	Learn about Consumer related regulatory
CO5	Comprehend business firms ,interface with consumers

Course Content **Instructional Hours / Week : 2**

Unit	Description	
I	**Conceptual Framework** **Consumer and Markets:** Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process	
	Instructional Hours	**6**
II	**The Consumer Protection Law in India** **Objectives and Basic Concepts:** Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and	
	Instructional Hours	**6**
III	**Grievance Redressal Mechanism under the Indian Consumer Protection Law** Who can file a complaint? Grounds of filing a complaint;	

	Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Offences and penalties.	
	Instructional Hours	**6**
IV	**Role of Industry Regulators in Consumer Protection** i. Telecommunication: TRAI ii. Food Products: FSSAI	
	Instructional Hours	**6**
V	**Contemporary Issues in Consumer Affairs** **Consumer Movement in India:** Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing.	
	Quality and Standardization: Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance.	
	Instructional Hours	**6**
	Total Hours	**30**

Text book :

"Consumer Affairs", Compiled by Department of Business Administration, Nehru Arts and Science College.

Suggested Readings:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, Universities Press.
2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.
3. G. Ganesan and M. Sumathy. (2012). Globalisation and Consumerism: Issues and Challenges, Regal Publications
4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, New Delhi
5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company
6. Girimaji, Pushpa (2002). Consumer Right for Everyone , Penguin Books.

Course Code	Title	
19U4NM3GTS	Non Major Elective : Gandhian Thoughts	
Semester: III	Credits : 2	ESE: 50 Marks

Course Objective:

To make them understand the philosophies of Gandhi better and fulfill their duties and responsibilities towards the society.

Course Outcome :

To upgrade the knowledge and skills of the students in Gandhian Thoughts and to encourage patriotism among the new generation, to put light on social issues and value of life.

Course Content **Instructional Hours/Week**: **02**

Unit	Description	
I	**Educational Philosophy of Gandhiji :** Definitions on Education - What is True Education? - Gandhiji's New Scheme of Education - Wardha Scheme of Education - Main Aims of Gandhian Education - Why Gandhiji's Scheme of Education was Called 'Basic Education?' - Features of the Wardha Scheme of Education - Features of Basic Education - The Methodology of Basic Education - The Content of Basic Education - Routine Work of a Basic School	
	Instructional Hours	**6**
II	**Gandhian Concept of Correlation of Studies -** Technique of Correlation - The Place of Teacher in Basic Education - Merits of Basic Education - Educational Scenario after Independence - Influences of Gandhiji on Education Commissions - Basic Schools in the Present Society - Education for Peace – A Gandhian View - Why Basic Education is called a Holistic Model	
	Instructional Hours	**6**
III	**Gandhiji's View on Truth and Non-Violence :** Gandhiji's Words about Truth - Meaning of Truth, Truth is God - Truth and God - The Importance of Truth in Human Life - Absolute and Relative Truth - Realisation of the Self - Liberation.	
	Instructional Hours	**6**
IV	**Mahatma Gandhi's Views on Women :** Status of Women in Pre Independence India - Gandhi's Perception of Women - Role of Women in Family – Perception of Gandhi - Value of Equality - Women in Politics - Gandhiji's Vision to Abolish Social Evils against Women - Role of Women as Envisaged by Gandhi.	

	Instructional Hours	**6**
V	**Gandhiji's View on Democracy (Gram Swaraj) :** City and Village - Gram Swaraj - Critique of Industrialisation - Critique of Machinery	
	Instructional Hours	**6**
	Total Hours	**30**

Text Book(s):

1. " Gandhian Thoughts", Compiled by Nehru Arts and Science College.

Course Code	Title	
19U4NM3WRT	Non Major Elective : Women's Rights	
Semester: III	Credits: 2	ESE : 50 Marks

Course Objective:

To facilitate the awareness on the social, economic, political, intellectual or cultural contributions of one or more women

Course Outcome:

- Examine the similarities and differences among women within and across cultures and at various moments
- Describe gender socialization and its consequences in a particular society
- Analyze how these factors with the privileges and disadvantages they confer have shaped one's own experiences, presumptions, viewpoints, and sense of identity
- Read and respond to feminist scholarship

Course Content **Instructional Hours / Week : 2**

Unit	Description	Text book	Chapter
I	**Laws, Legal System and Change** Definition - Constitutional law, CEDAW and International Human Rights - Laws and Norms – Laws and Social Context - Constitutional and Legal Framework	2	2
	Instructional Hours	**6**	
II	**Politics of land and gender in India** Land as Productive Resources	1	5
	Locating Identities – Women's Claims to Land – Right to Property - Case Studies	1	6,7
	Instructional Hours	**6**	
III	**Women's Rights: Access to Justice** Introduction – Criminal Law – Crime Against Women Domestic Violence – Dowry Related Harassment and Dowry Deaths- Molestation – Sexual Abuse and Rape Loopholes in Practice – Law Enforcement Agency	3	**7**

	Instructional Hours		**6**
IV	**Women's Rights** Violence Against Women – Domestic Violence The Protection of Women from Domestic Violence Act, 2005, The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856- The Dowry Prohibition Act, 1961	3	5
	Instructional Hours		**6**
V	**Special Women Welfare Laws** Sexual Harassment at Work Places, Rape and Indecent Representation , The Indecedent Representation (Prohibition) Act, 1986 , Immoral Trafficking , The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment , Role of Rape Crisis Centers. Protection of Children from sexual Offences Act 2012	3	9
	Instructional Hours		**6**
	Total Instructional Hours		**30**

Text Books:

1. Nitya Rao **Good Women do not Inherit Land** Social Science Press and Orient Blackswan 2008
2. International Solidarity Network **Knowing Our Rights** An imprint of Kali for Women 2006
3. P. D. Kaushik **"Women Rights"** Bookwell Publication 2007 UN Centre for Human Rights, Discrimination against Women (Geneva: World Campaign for Human Rights, 1994).

Reference Books:

1. Aruna Goal **Violence Protective Measures for Women Development and Empowerment,** Deep and Deep Publications Pvt. 2004
2. Monica Chawla **Gender Justice**, Deep and Deep Publications Pvt. Ltd.2006
3. Preeti Mishra **Domestic Violence Against Women,** Deep and Deep Publications Pvt. 2007
4. Clair M. Renzetti, Jeffrey L. Edleson, Raquel Kennedy Bergen, Source Book on **Violence Against Women** Sage Publications 2001

Course Code	Title		
20U3MCC411	Core Paper XI Numerical Methods		
Semester: IV	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

This Course provides the basic concepts and Techniques of Numerical solution of Transcendental equation, System of Algebraic equation, Numerical Differentiation, Numerical Integration and Applications.

Course Outcome:

CO1	To remember the concepts of solving transcendental equations and algebraic equations.
CO2	To understand the method of finite differences and also gain the knowledge interpolation on equal intervals.
CO3	To gain the knowledge of Interpolation for unequal intervals.
CO4	To evaluate problems on Numerical Differentiation and Integration.
CO5	To understand finite Difference method to solve Ordinary Differential Equations

Offered by: Mathematics

Course Content **Instructional Hours/ Week : 5**

Unit	Description	Text Book	Chapter
I	**The solution of Numerical, Algebraic and Transcendental Equations:** Iteration Method – Newton Raphson method - Convergence criteria – Order of convergence.	1	III
	Solution of Simultaneous linear Algebraic equations: Gauss Elimination method – Method of Triangularization – Gauss Seidel method.		IV
	Instructional Hours		**15**
II	**Finite Differences:** Differences –Operators –Forward and Backward difference tables - Differences of a Polynomial.	1	V
	Interpolation (for equal intervals): Newton's forward and backward formulae –Equidistant terms with one or more missing values. Central Differences and central difference table –Stirling's formula.		VI, VII
	Instructional Hours		**15**

III	**Interpolation (for unequal intervals):** Newton's divided differences formula –Lagrange's formula and Inverse Interpolation	1	VIII
	Difference Equation: Order and degree of a difference equation –Solving Homogeneous and Non–Homogeneous linear difference equations.		X
	Instructional Hours		**15**
IV	**Numerical Differentiation:** Newton's forward and backward formulae to compute the derivatives- Derivative using Stirling's formulae – To find maxima and minima of the function, given the tabular values.	1	IX
	Numerical Integration: Newton's – Trapezoidal rule – Simpson's $1/3^{rd}$ and $3/8^{th}$ rules.		
	Instructional Hours		**15**
V	**Numerical Solution of ODE (for first order only):** Taylor series method – Euler's method –Improved and Modified Euler method –Runge Kutta method (fourth order only).	1	XI
	Milne's predictor corrector formulae – Solution of ordinary differential equations by Finite difference method (for second order ODE).		
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. Venkataraman M. K, **Numerical Methods in Science and Engineering**, National Publishing Company, Fifth Edition , 2005.

Unit – I : Chapter III,IV , Page No : 85 – 105, 113 – 145

Unit – II : Chapter V, VI, VII Page No : 153 – 164, 193 – 208, 225-237

Unit –III : Chapter, VIII , X, Page No :, 244 – 264, 305 – 322

Unit- IV : Chapter IX , Page No : 265 – 292

Unit –V : Chapter XI, Page No : 336 – 363, 371-384.

Reference Books:

1. Kandasamy.P, Thilagavathi**, Allied Mathematics paper-1,** S.Chand and Company Ltd Reprint 2012.
2. Kandasamy. P, Thilagavathi. K and Gunavathi. K , **Numerical Methods**, S. Chand and Company Ltd, New Delhi –Revised Edition 2007
3. S. S. Sastry ," **Introductory Methods of Numerical Analysis**" , Fifth edition- 2012, PHI learning private limited, New Delhi,

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	M	H
CO2	H	H	H	M
CO3	M	H	M	M
CO4	M	M	H	M
CO5	H	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCC412	Core Paper XII Fourier Series, Fourier Transforms and Vector Calculus		
Semester: IV	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective:

This Course gives emphasis to enhance the knowledge of students in the concepts of Vector Calculus, Fourier series and Fourier transforms.

Course Outcome:

CO1	To find the Fourier Coefficient for a Periodic function.
CO2	To evaluate the finite integrals using Fourier transform.
CO3	To learn the basic concepts of Vector Calculus
CO4	To learn the method of evaluating Multiple integrals,
CO5	To apply the ideas of Vector calculus to solve Line, Surface and Volume integrals.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Fourier Series:** Definition – Finding Fourier coefficients for a given periodic function with period 2π-Odd and Even functions- Half range series.	2	Full
	Instructional Hours		**15**
II	**Fourier Transform:** Properties of Fourier Transform-Shifting Property - Change of Scale property-Modulation theorem-Convolution theorem for Fourier transform- Parseval's identity for Fourier transform.	3	4
	Instructional Hours		**15**
III	**Scalar and Vector point functions**- Differentiation of Vectors-Differential operators- Directional Derivative, Gradient, Divergence, Curl- Some properties and theorems.	1	1,2
	Instructional Hours		**15**
IV	**Multiple Integrals:** Double integrals using polar co-ordinates and Cartesian co-ordinates-Triple integrals using spherical polar-co-ordinates and cylindrical co-ordinates.	1	3
	Instructional Hours		**15**
V	**Integration of Vectors:** Line, Surface and Volume integrals-Theorems of Gauss, Green, Stokes (Statements only) – Verifications.	1	3
	Instructional Hours		**15**
	Total Hours		**75**

Text Book(s):

1. P. Duraipandian, Laxmi Duraipandian , **Vector Analysis** , Revised edition , Emerald Publishers, Reprint (2005)
2. T. K. Manikavachagam Pillai, S.Narayanan, **Fourier series**, S.Viswanathan (Printers & Publications) Pvt.Ltd, New Delhi , 1993.
3. Dr.M.K.Venkataraman, **Engineering Mathematics** , 12th edition, The National Publishing Company, 1995.

Unit I : Book 2 Full
Unit II : Chapter 4-Sections: 6,7,8,9
Unit III : Chapter 1 and 2
Unit IV : Chapter 3 – Section 3.1 – 3.8
Unit V : Chapter 3

Reference Book:

1. P. Kandasamy & K.Thilagavathy, **Mathematics for B. Sc. – Vol. IV** (Vector Calculus, Fourier series), S. Chand and Company Ltd., 2004.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	M	M
CO2	H	M	H	M
CO3	H	H	M	M
CO4	M	M	H	M
CO5	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCC413	Core Paper XIII Programming in C++		
Semester: IV	Credits: 4	CIA:25 Marks	ESE: 55 Marks

Course Objective:

To enable the students to learn about the class structure, operators, inheritance, polymorphism.

Course Outcome:

CO1	To remember the basic concepts of OOPS
CO2	To understand the class structure, operators and statements of C++ language.
CO3	To gain knowledge about arrays, polymorphism.
CO4	To gain Knowledge about inheritance
CO5	To create C++ Program to solve simple Mathematical Problem

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Basic concepts of OOPS- Evolution of C++ - Applications of C++ - Structure of C++ program.	1	1,2
	Tokens – Keywords – Identifiers and Constants – Basic data types – User-defined data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic initialization of variables – Reference variables – Operators in C++ - Scope resolution operator – Memory Management operators – Manipulators – Type cast operator – Expressions and their types – Special assignment expressions – Implicit conversions – Operator precedence.	1	3
	Instructional Hours		**15**
II	Functions in C++ : The main function – Function prototyping – Call by reference – Return by reference – Inline functions – Default arguments – Const arguments – Function overloading.	1	4
	Instructional Hours		**15**
III	Classes and Objects: Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Arrays within a class – Memory allocation	1	5

	for objects –Arrays of objects – Objects as function arguments – Friend functions – Returning objects – Const member functions.		
	Constructors and Destructors: Introduction – Constructors – Parameterized constructors – Multiple constructors in a class – Constructors with default arguments – Copy constructor.	1	6
	Instructional Hours		**15**
IV	Operator Overloading: Introduction – Defining operator overloading – Overloading unary operators – Overloading binary operators - Overloading binary operators using friends – Rules for overloading operators.	1	7
	Inheritance: Introduction – Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance.	1	8
	Instructional Hours		**15**
V	Pointers, Virtual functions and Polymorphism: Introduction-Pointers-Pointers to objects-Pointers to derived classes-virtual functions.	1	9
	Managing Console I/O Operations: C++ streams – C++ stream classes – Unformatted console I/O operations – Formatted console I/O operations – Managing output with manipulators.	1	10
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. E. Balagurusamy , **Object Oriented programming with C++**, Fourth Edition, TataMcGraw Hill.

Reference Books :

1. Ashok N. Kamthane, **Object oriented Programming with Ansi and Turbo C++,** Dorling Kindersley India Pvt. Ltd., 2007

2. D. Ravichandran, **Programming with C++,** Tata McGraw-hill publishing company Ltd., 2008

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Programming Solving Skill	Attendance	Total
5	5	5	6	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	L	M
CO2	H	L	M	L
CO3	M	H	H	M
CO4	M	H	H	M
CO5	H	M	H	M

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3MCP414	Core Paper XIV C ++ Programming With Numerical Methods Practical		
Semester: IV	Credits: 2	CIA:20 Marks	ESE: 30 Marks

Course Objective:

To enable the students to apply the basic structure, Statements, arrays, functions and various concepts of C++ language to create programs by Numerical methods**.**

Course Outcome:

CO1	To create C++ Programs using classes
CO2	To create C++ Programs for solving Numerical Problems.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

S.No.	List of Programs
1	Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.
2	Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT
3	Write a C++ Program to Solve Algebraic equation of Order 2.
4	Write a C++ Program to Solve Algebraic equation of Order 3 by Iteration method.
5	Write a C++ Program to Solve Algebraic equation of Order 3 by Newton Raphson method.
6	Write a C++ Program to Solve Simultaneous Linear Algebraic equation using by Gauss Elimination method.
7	Write a C++ Program to Solve Simultaneous Linear Algebraic equation using by Gauss Jordan method.

8	Write a C++ Program to Solve Simultaneous Linear Algebraic equation using by Gauss Seidel method.	
9	Write a C++ Program to solve the definite integral using Trapezoidal rule.	
10	Write a C++ Program to solve the definite integral using Simpson's $1/3^{rd}$ rule.	
		Total Hours: 30

Tools for Assessment (20 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
3	3	4	4	3	3	20

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
20U3PYA404	Allied Paper IV Physics - II		
Semester: IV	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective:

To enable the students in order to learn the basic principles, theory and concepts of elementary particles and semiconductors in digital electronics.

Course Outcome:

CO1	Gain knowledge dual nature of light
CO2	Acquire basic knowledge of modern physics
CO3	Apply photonics concepts for communication
CO4	Understood the types, basic properties and transmission characteristic of
CO5	Develop digital electronic systems with semiconductor materials

Offered by: Physics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Modern physics:** Einstein's photo electric equation – verification of Einstein's photo electric equation by Millikan's experiment –photo electric cells – applications - De Broglie concept of matter waves – characteristics and calculation of De Broglie wave length - Study of De Broglie matter wave by G.P.Thomson experiment.	1	12
	Instructional Hours		**15**
II	**Nuclear physics:** Nuclear forces –characteristics - nuclear structure by liquid drop model –Binding energy –mass defect –particle accelerators –cyclotron and betatron –nuclear Fission and nuclear Fusion – introduction to elementary particles –Leptons, Mesons and Baryons	1	14
	Instructional Hours		**15**
III	**Laser physics**: Principles of laser–population inversion –meta stable state –conditions for laser actions -Types –Nd-Yag –Helium –neon laser –applications of lasers –	1	8

	Raman effect –Raman shift –stokes and anti stokes lines		
	Instructional Hours		**15**
IV	FIBRE optics: Features of fibre optical cable- Principle and propagation of light in optical fibre Total internal reflection-numerical aperture and acceptance angle Types of fibre optical cable – Rayleigh Scattering losses – Absorption losses	1	9
	Instructional Hours		**15**
V	**Digital Electronics:** Number systems –conversion of binary into decimal –conversion of decimal to binary – binary addition and subtraction –Basic logic gates – NAND and NOR as an universal logic gates – Demorgan's theorems –Boolean algebra – applicationsof Demorgans theorems –Half adder and full adder circuits.	2	10
	Instructional Hours		**15**
	Total Hours		**75**

Text Books:

1. Murugeshan R. and Kiruthiga Sivaprasath Er. **Modern Physics.** S Chand and Co, New Delhi, 3rd Edition, 2008.
2. V.K. Mehta, **Principles of Electronics**, S.Chand and Company Ltd., 2nd Edition, 2009.
3. Subir Kumar Sarkar. **Optical Fibres and Fibre Optic Communication Systems** Chand and Co, New Delhi, 4th Edition, 2007.

Reference Books:

1. Arthur Beiser. **Concepts of Modern Physics.** 6th Edition Tata McGraw Hill Publishing Company Ltd, New York. 6th Edition, 2008.
2. Sehgal D.L, Chopra K.L and Sehgal N.K. **Modern Physics.** S Chand and Co, New Delhi.1983.
3. Tayal D.C. **Nuclear Physics**. Himalaya Publishing House, Mumbai, 2011.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	OBE Evaluation – Tool 01 Assignment	OBE Evaluation – Tool 02 Seminar	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	L
CO2	H	H	M	H	M
CO3	H	M	H	M	H
CO4	H	H	H	H	H
CO5	M	H	H	H	H

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Code	Title		
18U3PYR405	Allied Paper V Physics Practical		
Semester: III & IV	Credit: 2	CIA: 20 Marks	ESE: 30 marks

Course Objective:

To enable the students in order to understand the basic ideas' practically on the Mechanics, Optics, Basic Electronics

Course Outcome:

CO1	Determine the Mechanical and Optical properties of some glass materials.
CO2	Gain knowledge of Basic Electronics for circuit construction
CO3	Ability to identify the requirements of certain electronic components in appropriate cases.
CO4	Acquire knowledge of every experiments by demonstrate the experiments
CO5	Ability to handle the apparatus.

Offered by: Physics

Course Content **Instructional Hours / Week: 2**

S.No	Experiments
	(Any 12 Experiments)
1	Acceleration due to gravity-Compound pendulum method
2	Moment of inertia –Torsional pendulum method
3	Young's modulus -Uniform bending -Optic lever method
4	Young's modulus -Non-uniform bending -Pin and microscope
5	Rigidity modulus –Static torsion method.
6	Frequency of A.C -Sonometer
7	Thermal conductivity -Lee's disc method.
8	Refractive index of a solid prism -Spectrometer
9	Refractive index of a liquid prism –Spectrometer
10	(i-d) curve -solid prism -Spectrometer

11	Wavelengths of spectral lines –Grating-Normal incidence -Spectrometer
12	Wavelength of spectral lines –Grating -Minimum deviation -Spectrometer
13	Radius of curvature of lens -Newton's rings method.
14	Characteristics of PN Junction diode
15	Characteristics of Zener diode
	Total Hours 60

Tools for Assessment (20 Marks)

OBE Tool - Preliminary work	OBE Tool- Preliminary work	Test I	Test I	Observation	Attendance	Total
3	3	4	4	3	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	L
CO2	H	H	M	H	M
CO3	H	M	H	M	H
CO4	H	H	H	M	H
CO5	M	M	H	H	H

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U4MCS402	Skill Based Paper II Quantitative Aptitude		
Semester: IV	Credits: 3	CIA:20 Marks	ESE:55 Marks

Course Objective:

This course presents shortcut methods to solve quantitative problems and increases the problem solving ability of students.

Course Outcome:

CO1	To understand and gain knowledge about L.C.M & H.C.F.
CO2	To analyze Profit and Loss and Ratio.
CO3	To enhance the skill of understanding problems on Ages and Calendar.
CO4	To evaluate the Problems on Train and Boats and Streams.
CO5	To evaluate the Problems on Pipes and Cistern.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

Unit	Description	Text Book	Chapter
I	Numbers	1	1
	L.C.M. & H.C.F.	1	2
	Average	1	6
	Instructional Hours		**9**
II	Percentage	1	10
	Profit and Loss		11
	Ratio and Proportion		12
	Instructional Hours		**9**
III	Simple Interest	1	21
	Compound Interest		22
	Problems on Ages	1	8
	Problems on Calendar	1	27
	Problems on Clocks	1	28
	Instructional Hours		**9**
IV	Time and distance	1	17
	Problems on Trains	1	18
	Boats and Streams	1	19

	Instructional Hours		**9**
V	Time and Work	1	15
	Pipes and Cisterns	1	16
	Instructional Hours		**9**
	Total Hours		**45**

Text Books:

1. Dr. R. S. Aggarwal , **Quantitative Aptitude** , S. Chand, 7th Edition, 2008

Reference Book:

1. Dr. R. S. Aggarwal , **A Modern approach to verbal and non-verbal reasoning**, S. Chand, 7th Edition, 2008 .

Tools for Assessment (20 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
3	**3**	**4**	**4**	**3**	**3**	**20**

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M
CO3	H	L	M	M
CO4	M	L	M	M
CO5	H	M	M	L

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4NM3BT2	BASIC TAMIL	
Semester: IV	Credits: 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective: அற இலக்கியங்களை அறிமுகப்படுத்தல;

Course Outcomes:

1. அற இலக்கிய அறிவு பெறுதல் - சிறு சிறு கதைகள் வழி சமூக அறிவு பெறுதல்.
2. மொழியைப் பிழையின்றிப் பேச, எழுத திறன் பெறச்செய்தல்.

Offered by : தமிழ்த்துறை

Course Content **Instructional Hours / Week: 2**

Unit	Description	
I	**நீதி நூல்கள்** 1. பாரதியார் - ஆத்திச்சூடி - முதல் 12 வரிகள் 2. கொன்றைவேந்தன் முதல் 7 வரிகள்	
	Instructional Hours	**5**
II	**திருக்குறள்** கடவுள் வாழ்த்து - அகரமுதல எனத் தொடங்கும் - அதி. - 1குறள் - 1 வான் சிறப்பு - நீரின்றி அமையாது உலகு - அதி. - 2 குறள் - 10 அன்புடைமை - அன்பின் வழியது உயிர்நிலை - அதி. - 8 குறள் - 10 கல்வி - கண்ணுடையார் என்பர் - அதி. - 40 குறள் - 3 இனியவை கூறல் - இனிய உளவாக இன்னாத - அதி. - 10 குறள் - 10	
	Instructional Hours	**10**
III	**நீதிக்கதைகள்** முல்லாவின் வேடிக்கைக் கதைகள், பீர்பால் கதைகள்	
	Instructional Hours	**5**
IV	**கிராமியக் கதைகள்** 1. பரமார்த்தக்குரு கதைகள் 2. நாட்டுப்புறக் கதைகள் அறிமுகம்	
V	**மொழிப் பயிற்சி** 1. பிறமொழிச்சொற்களுக்கு தமிழ்ச்சொல் எழுதுதல் 2. தன்விவரம் எழுதுதல் 3. எங்கள் கல்லூரி	
	Instructional Hours	**5**
	Total Hours	**30**

பாடத்தொகுப்பு :

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல் "**அரிச்சுவடி**"

தொகுப்பு: தமிழ்த்துறை, நேரு கலை அறிவியல் கல்லூரி, கோயம்புத்தூர்.

Course Designed by	Verified by	Checked by	Approved by

Course Code	Title	
19U4NM4AT2	ADVANCED TAMIL	
Semester: IV	Credits: 2	ESE : 50 Marks

(Common to all UG Programmes)

Course Objective: நூல்களின் வழி அறச்சிந்தனைகளை உருவாக்குதல்
செம்மொழியினைச் செம்மைப்படுத்துதல்.

Course Outcomes:
1. அறச்சிந்தனைகள் பெறுதல் மற்றும் இலக்கண வழக்கு முறைகளைப் பெறுதல்.
2. மொழியைப் பிழையின்றிப் பேச, எழுத திறன் பெறச்செய்தல்

Offered by : தமிழ்த்துறை

Course Content **Instructional Hours / Week: 2**

Unit	Description
I	**பதினெண் கீழ்க்கணக்கு நூல்கள்**
	திருக்குறள் 1. வாய்மை 2. கூடா நட்பு 3. செய்நன்றியறிதல்
	Instructional Hours 10
II	**சிறுகதை**
	பூனாத்தி சிறுகதைகள் - வெ. இறையன்பு 1. விடுகதை 2. நண்பர்கள்
	Instructional Hours 5
III	**எழுத்துப்பிழை நீக்க வழிகள்**
	1. சொற்களைச் சரியாகப் பயன்படுத்தும் முறை 2. வினைச் சொற்கள், பெயர்ச்சொற்கள்
	Instructional Hours 5
IV	**வழக்கறிதல்**
	மரபு, இயல்பு, வழக்கு - தகுதி வழக்கு அறிதல்
V	**படைப்பாற்றல் பயிற்சி**
	கவிதை - சிறுகதை - நூல் மதிப்பீடு எழுதுதல்
	Instructional Hours 5
	Total Hours 30

பாடத்தொகுப்பு :

இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல் "**திரட்டு**".

தொகுப்பு: தமிழ்த்துறை, நேரு கலை அறிவியல் கல்லூரி, கோயம்புத்தூர்.

பார்வை நூல்கள்:

1. திருக்குறள் - பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை.
2. அ.கி. பரந்தாமனார் - நல்ல தமிழ் எழுத வேண்டுமா? அல்லி நிலையம், சென்னை.
3. பவணந்தி முனிவர், நன்னூல் பூலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்னை.
4. வெ. இறையன்பு - பூனாத்தி, கவிதா பதிப்பகம், சென்னை.

Course Designed by	Verified by	Checked by	Approved by

Course Code	Title	
19U4NM4GEN	General Awareness	
Semester: IV	Credits : 2	ESE : 50 Marks

Course Objective:

Enable the students to learn General knowledge and prepare different competitive exams.

Course Outcome:

- Analysis the Verbal and Numerical Aptitude
- Understood the General Science and Technology and Education
- Gain Knowledge in Computer aids and Social Studies
- Develop Aptitude and problem solving skills

Course Content **Instructional Hours / Week : 2**

S. No.	Topics
1	Verbal Aptitude
2	Numerical Aptitude
3	Abstract Reasoning
4	Tamil and Other Literature
5	General Science and Technology
6	Computer
7	Economics and Commerce
8	History and Freedom Struggle
9	Sports
10	Current Affairs
	Total Hours : 30

Text Book : " General Awareness" , compiled by Nehru Arts and Science College, Coimbatore

Course Code	Title		
18U4HVY402	Value Education: Human values and Yoga Practice II		
Semester: III & IV	Credit: 2	CIA: 25 Marks	ESE: 25 Marks

Course Objective

- To help the students appreciate the essential complementarily between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings
- To prepare and distribute standardized Yoga teaching and training materials with reference to institute health

Course Outcome (CO):

At the end of the course, students are expected

CO 1	To become more aware of their self and their relationships and would have better reflective and discerning ability.
CO 2	It is hoped that they would be able to apply what they have learnt to their own self in different ordinary day-to-day settings in real life with higher commitment and courage.
CO 3	To enable students to lead a practical life adding value to human relations.
CO 4	To have the basic Knowledge on Simplified Physical Exercises and Asanas and Meditation

Course Content **Instructional Hours / Week: 1**

Unit	Description	Text Book	Chapter
I	**Self-realization and Human Values-** Self-realization and Harmony-Rules and Regulations-Rights and Duties-Good and Obligation-Integrity and Conscience. **Obligation to Family-** Trust and Respect -Codes of Conduct -Citizens Charter - Emotional Intelligence.	1	1,4
	Instructional Hours		**6**
II	Impact of Modern Education and Media on Values: Impact of Science and Technology on Values; Effects of computer aided media on Values (Internet, e-mail, Chat etc.); Role of teacher in the preservation of tradition and culture;	1	5
	Instructional Hours		**6**
III	Eradication of worries - Maintaining youthfulness - Greatness of friendship – Refinement of worries - Neutralization of	1	2,3

	anger- Intelligent quotient (IQ), Emotional quotient (EQ), Spiritual Quotient (SQ)		
	Instructional Hours		**6**
IV	Standing Posture: Tadasana, Padahastasana, Virabhadrasana; Sitting posture: Ustrasana, Ardha Matsyendrasana, Paschimottanasana.	2	4,5
	Instructional Hours		**6**
V	Supine posture: Sarvangasana, Halasana, Chakrasana. Prone posture: Bhujangasana, shalabhasana; Dhanurasana; Balancing postures: Vrikshasana, Natarajasana, Utkatasana; Pranayama: Bhastrika, Bhramari, NadiShodhan.	2	6,9
	Instructional Hours		**6**
	Total Hours		**30**

Textbook(s):

1. Kiran, D.R. "Professional Ethics & Human Values", TATA McGraw Hill Education.
2. Chandrasekaran, 1999.Sound Health through yoga, Prem Kalyan Publications, Madurai.

Reference Books :

1. Vethathiri Maharishi, 2011,"Value Education", Vethathiri Publication, Erode
2. Thathuvagnani Vethathiri Maharishi, 2014, "Simplified Physical Exercises". Vethathiri Publications

Course designed by	Verified by HoD	Checked by	Approved by

Course Code	Title		
20U3MCC515	Core Paper XV Real Analysis		
Semester: V	Credits: 4	CIA:25 Marks	ESE:75 Marks

Course Objective:

This course gives emphasis to enhance student knowledge in applying Mathematical concepts and theory of functions of real variable.

Course Outcome:

CO1	To remember the basic concepts of Real number system.
CO2	To understand the concept of Covering and Compactness in R^n.
CO3	To analyze the convergence and continuity of Vector and Complex valued functions.
CO4	To know the concepts of functions of Bounded and Total variation.
CO5	To learn about Riemann Stieltjes Integrals and its reduction to Riemann integral.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**The Real and Complex Number Systems:** Least upper bound, greatest lowest bound- the Cauchy Schwarz inequality **Some Basic Notations of Set Theory**: Countable and uncountable sets- Uncountability of the real number system. **Elements of point set Topology:** Euclidean space R^n –open balls and open sets in R^n. The structure of open Sets in R^1 –Closed sets and Adherent points.	1	1,2,3
	Instructional Hours		**15**
II	The Bolzano–Weierstrass theorem –The Cantor Intersection Theorem. Lindelof Covering Theorem – The Heine Borel Covering Theorem – Compactness in R^n. **Metric Spaces**: Definition-Example -Point set Topology in Metric Spaces –Compact subsets of a Metric Space .Cauchy Sequences –Complete Metric Space.	1	3
	Instructional Hours		**15**
III	**Convergent Sequences in a Metric Space :** Limit of a function –Continuous function–Continuity of Composite function- Continuous Complex valued and Vector valued functions – Continuity and Inverse images of open or closed sets – Functions continuous on Compact sets- Topological Mappings- Bolzano's Theorem.	1	4
	Instructional Hours		**15**

IV	**Derivatives**: Definition–Derivatives and Continuity – Algebra of Derivatives –Rolle's Theorem –The Mean value Theorem for derivatives –Taylor's formula with remainder. **Monotonic Functions:** Definition- Properties- Functions of Bounded variation –Total Variation – Additive property of Total variation on (a, x) as a function of x.	1	5,6
	Instructional Hours		**15**
V	**The Riemann - Stieltjes integral :** Introduction – Notation –Definition--Linear properties –Integration by parts –Change of variable in Riemann –Stieltjes integral –Reduction to Riemann integral.	1	7
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. Tom. M. Apostol, **Mathematical Analysis**, 2nd Edition., Addison-Wisely, Narosa Publishing Company, Chennai, 1990.

Unit – I : Chapter 1, 2, 3, Sections- 1.10, 1.19, 2.12 to 2.13, 3.2 to 3.7

Unit – II : Chapter 3, Sections – 3.8 to 3.16

Unit –III : Chapter 4, Sections – 4.2 to 4.15

Unit- IV : Chapter 5, 6, Sections – 5.2 to 5.4, 5.9 to 5.12, 6.2 to 6.6

Unit –V : Chapter 7, Sections – 7.1 to 7.7

Reference Books :

1. R. R. Goldberg, **Methods of Real Analysis**, Oxford & IBH Co.Pvt.Ltd. New York 1976.

2. G. F. Simmons, **Introduction to Topology and Modern Analysis**, McGraw – Hill, New York, 1963.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	H
CO2	H	H	H	M
CO3	M	H	M	H
CO4	M	M	H	M
CO5	H	M	H	M

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCC516	Core Paper XVI Mechanics		
Semester: V	Credits: 4	CIA: 25 Marks	ESE:75 Marks

Course Objective:

This Course enables the students to determine the Moments, Resultant and Equilibrium conditions of system of forces and to apply Laws, Principles, and Postulates governing the Dynamics in physical reality.

Course Outcome:

CO1	To understand and apply the concept of Parallelogram Law in finding the Resultant Force .
CO2	To gain the knowledge about Resultant of any number of Coplanar force and equilibrium conditions.
CO3	To find the moments of like and unlike forces using Varignon's Theorem.
CO4	To understand the Impact on a smooth fixed plane- for a single body and two smooth bodies.
CO5	To calculate the Loss of Kinetic energy during direct and oblique impacts of two smooth spheres.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Forces acting at a point:** Resultant and Component- Definition- Simple Cases-Parallelogram of Forces- Analytical Expression for the Resultant of two Forces acting at a point – Triangle of Forces - Perpendicular Triangle of Forces - Converse of the Triangle of Forces- Lami's Theorem.	1	2
	Instructional Hours		**15**
II	**Polygon of forces** : The Polygon of Forces- Extended form of Parallelogram law of Forces ((λ,μ) theorem) - Theorem on Resolved Parts- Resultant of any number of Coplanar Forces acting at a Point- Analytical method- Conditions of Equilibrium.	1	3
	Instructional Hours		**15**
III	**Parallel Forces** – Introduction- Resultant of - two like Parallel Forces - two unlike and unequal Parallel Forces - a number of Parallel Forces –Conditions of Equilibrium of three Coplanar Parallel Forces- Centre of two parallel forces.	1	3

	Instructional Hours		**15**
IV	**Impact on a fixed surface**: Impulsive Force – Impact of two smooth bodies - Impact of two smooth fixed plane - Loss of Kinetics Energy in impact - Direct impact of two smooth spheres	2	7,8
	Instructional Hours		**15**
V	Loss of Kinetic energy during direct impact of two smooth spheres-Problem Related to direct method- Oblique impact of two smooth spheres- Loss of Kinetic energy due to oblique impact of two smooth spheres.	2	8
	Instructional Hours		**15**
	Total Hours		**75**

Text Book(s):

1. M. K. Venkataraman, **Statics**, Agasthiar Publications, Trichy, 2002.

Unit I : Chapter 2, Sections: 1 to 7, 9

Unit II : Chapter 2, Sections: 8, 10, 13 to 16

Unit III : Chapter 3, Sections: 1 to 14

2. M. K. Venkataraman , **Dynamics**, Agasthiar Publications, Trichy, 2011

Unit- IV : Chapter 7, Sections: 7.1 to 7.4
Chapter 8, Sections: 8.1 to 8.5

Unit –V : Chapter 8, Sections- 8.6 to 8.8

Reference Books:

1. A.V.Dharmapadam, **Statics** , S.Viswanathan Printers and Publishing Pvt., Ltd, 2013.
2. P.Duraipandian and Laxmi Duraipandian, **Mechanics** , S.Chand and Company Ltd, Ram Nagar, New Delhi -55, 1985.
3. 1. A. V. Dharamapadam, **Dynamics**, S.Viswanathan Printers and Publishers Pvt., Ltd, Chennai, 2011.
4. N.P. Bali, **Dynamics**, Laxmi publications, New Delhi

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	M
CO2	M	H	H	M
CO3	H	M	M	H
CO4	M	M	H	M
CO5	H	M	M	M

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCC517	Core Paper XVII Visual Basic		
Semester: V	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

This course aims to Explore Visual Basic's Integrated Development environment and make the students to understand the applications using forms, controls and events .

Course Outcome:

CO1	To remember the fundamental concepts of Visual Basic.
CO2	To learn about VB control functions.
CO3	To create Menu and Dialogue Boxes.
CO4	To gain Knowledge about modulus, procedures and arrays.
CO5	To convert Visual Basic programs to executable files that will run in the Windows Environment

Offered by: Mathematics

Course Content **Instructional Hours / Week: 4**

Unit	Description	Text Book	Chapter
I	Introduction to VB – Event and Event Procedure – Object related Concept – VB Program Development Process – Components – VB Environment – Saving and Running – VB Project	1	1
	VB Fundamentals – Constants – Variables – Operators – Library Functions	1	2
	Instructional Hours		**12**
II	Branching and Looping – Logical Operators – If – then- else, Select Case – For Next, Do Loop. While – Wend, Stop	1	3
	VB Control Functions – Forms and Controls	1	4
	Instructional Hours		**12**
III	Menus and Dialog Boxes: Building Drop down menus, Accessing Menu – Sub Menus – Popup Menus – Dialog Boxes	1	5
	Executing and Debugging a project – Errors – Error Handlers	1	6
	Instructional Hours		**12**
IV	Procedures : Modulus and Procedures – Sub Procedures – Event Procedures – Function Procedures	1	7
	Arrays : Characteristics – Declarations – Dynamic Arrays – Control Arrays	1	8
	Instructional Hours		**12**

V	Data Files: Characteristics – Accessing and Saving a file in VB – Processing – Sequential Data File –Random Access File – Binary Files	1	9
		Instructional Hours	**12**
		Total Hours	**60**

Text Book:

1. Byron S. Gottfried, **Visual Basic**, Schaum's Outlines., 2002

Reference Books:

1. Gary Cornell, **Visual Basic 6**, Tata McGraw – Hill Edition
2. Mohammed Azam, **Programming with Visual Basic 6.0**, Vikas Publishing House Pvt. Ltd. 2007

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	M
CO2	H	H	H	M
CO3	H	H	M	L
CO4	M	L	M	M
CO5	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCP518	Core Paper XVIII Visual Basic Practical		
Semester: V	Credits: 2	CIA: 20 Marks	ESE:30 Marks

Course Objective:

This course aims to develop projects using Visual basic tools.

Course Outcome:

CO1	To create VB projects and illustrate the use of Controls
CO2	To solve Mathematical problems using VB tools.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

S. No	Program list
1.	In VB, create a project that displays the current data and time. Use VB variable Now and the Format Library function.
2.	**Write a Program** To enter and display text. Use text box and command button.
3.	To convert temperature from Fahrenheit to centigrade or vice-versa
4.	To select any one from a list. Use combo box to display choices.
5.	To calculate factorial of a given number.
6.	To illustrate the usage of Timer control
7.	To illustrate the usage of scroll bars.
8.	To illustrate the usage of Drop down menus.
9.	To illustrate the usage of menu enhancement.
10.	To illustrate the usage of Pop-up menu.
11.	To illustrate the usage of input boxes.
12.	To find smallest of n numbers.
13.	To find the sine of angle.
14.	To sort list of numbers.
15.	To determine deviations about an average.
	Total Hours: 45

Tools for Assessment (20 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
3	3	4	4	3	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCC519	Core paper-XIX Number Theory and Cryptography		
Semester: V	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective: To understand number theoretical algorithms of modern cryptography and the principles behind their Security.

Course Outcome:

CO1	To gain the Knowledge about the Fundamental theorem of Arithmetic.
CO2	To know the ideas of Permutations, Combinations and Generating Functions.
CO3	To apply the concepts of Linear Congruences in problem solving.
CO4	To know the Security Techniques and its Architecture
CO5	To understand the principles of Public Key .

Offered by: Mathematics

Course Content **Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapter
I	Euclid's Division Lemma, Divisibility, The Linear Diophantine Equation, The Fundamental theorem of Arithmetic.	1	2
	Instructional Hours		**15**
II	Permutations and Combinations, Fermat's Little theorem, Wilson's theorem, Generating Functions.	1	3
	Instructional Hours		**15**
III	Basic Properties of Congruences, Residue Systems. Linear Congruences, The theorems of Fermat and Wilson Revised-Chinese Remainder Theorem.	1	4,5
	Instructional Hours		**15**
IV	Introduction to Cryptography: Security trends – The OSI security architecture – Security attacks- Security services- Security mechanisms – A model for network security- Symmetric cipher model – Substitution techniques-Transposition techniques.	2	1
	Instructional Hours		**15**
V	Principles of Public - key Cryptosystems: Public key cryptosystem – Applications – Requirements – Cryptanalysis-The RSA algorithm: Description-Computational aspects-Security of RSA.	2	9
	Instructional Hours		**15**
	Total Hours		**75**

Text Book(s):

1. George E. Andrews, **Number Theory** , Hindustan Publishing Corporation-1984.
2. William Stallings, Cryptography and Network Security Principles and Practices, Fourth edition, PHI publication, New Delhi, 2008.

Unit – I : Book 1: Chapter 2, Sections - 2.1 to 2.4

Unit – II : Book 1: Chapter 3, Sections - 3.1 to 3.4

Unit –III : Book 1: Chapter 4, Sections - 4.1 to 4.2
Chapter 5, Sections - 5.1 to 5.2

Unit- IV : Book 2: Chapter 1, Sections – 1.1 to 1.6
Book 2: Chapter 2 , Section - 2.1 to 2.3

Unit –V : Book 2: Chapter 9, Sections 9.1 and 9.2

Reference Books :

1. S.B. Malik, **Basic Number Theory**, Vikas Publishing House Private Limited.
2. K.C. Chowdhury, **First Course Theory of Numbers**, Asian Books Private Limited - I Edition (2004).

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	H
CO2	H	H	H	M
CO3	M	H	H	M
CO4	H	M	H	M
CO5	H	M	H	M

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE501	Discipline Specific Elective I - A Digital Electronics and Computer Fundamentals		
Semester: V	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective:

To enable the students to learn the Computer Fundamentals and basics of Digital Electronics

Course Outcome:

CO1	To understand about the Binary to Decimal conversion and Octal number process.
CO2	To gain knowledge about the optimal solutions.
CO3	To apply the Network representation in Mathematics.
CO4	To solve mathematical problems using Graphs.
CO5	To apply the concept of Digital recording techniques

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Number System and Codes – Binary to Decimal - Conversion - Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers –ASCII Code – Excess -3 Code –Gray Code	1	5
	Instructional Hours		**15**
II	Logic circuits: Gates – AND, OR, NOT, NAND and NOR gates	1	2
	Truth tables – Boolean Algebra –Don't care conditions	1	3
	Multiplexers and Demultiplexers	1	4
	Flip flops – RS, JK, D, T Flip flops	1	8
	Instructional Hours		**15**
III	Shift Registers	1	9
	Counters	1	10
	Arithmetic circuits – Half adder – Full Adder –Half & full Subtractor – Binary Adder & Subtractor – Serial & Parallel Binary Adders - BCD Adder.	2	5
	Instructional Hours		**15**
IV	I/O devices: Punched tape – Tape readers – Alphanumeric codes – Character recognition – CRT – Output Device : Magnetic tape Output offline Operation – Error detecting and correcting codes – Printers: Dot Matrix, Laser, CRT, Keyboards – Terminals.	2	7
	Instructional Hours		**15**
V	Semiconductor Memories: ROM – RAM – Static RAM, Dynamic RAM –Magnetic disc memories – Magnetic tape – Digital recording techniques	2	6
	Instructional Hours		**15**
	Total Hours		**75**

Text Books:

1. Donald P Leach, Albert Malvino , Goutam Saha, **Digital Principles and Applications** , Tata Mc-Graw Hill Publishing, 2006
2. Thomas C. Bartee, **Digital Computer Fundamentals**, Tata Mc-Graw Hill Publishing, 2005

Unit I	:	Text Book 1-Chapter 5
Unit II	:	Text Book 1-Chapter 2
		Text Book 1-Chapter 3
		Text Book 1-Chapter 4, Sections 4.1 & 4.2
		Text Book 1-Chapter 8
Unit III	:	Text Book 1 -Chapter 9, Chapter 10
		Text Book 2 – Chapter 5, Sections 5.1 to 5.11
Unit IV	:	Text Book 2-Chapter 7, Sections 7.1 to 7.13
Unit V	:	Text Book 2-Chapter 6, Sections 6.1 to 6. 15

Reference Books:

1. M. Morris Mano, **Digital logic and Computer Design**, Pearson Education , Prentice Hall, 2007
2. Bruce F. Katz, **Fundamentals of Digital Design**, Dreamtech Press,2006

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	M	H
CO2	H	H	H	M
CO3	M	M	M	L
CO4	M	L	H	H
CO5	H	H	H	H

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE502	Discipline Specific Elective I-B Discrete Mathematics		
Semester: V	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective:
This course is aimed to develop Logical thinking and its application to Computer Science.

Course Outcome:

CO1	To know the basic concepts of Mathematical Logic.
CO2	To classify Functions and Relations.
CO3	To gain knowledge about Formal Languages and Automata Theory.
CO4	To understand the concepts of Lattices & Boolean Algebra
CO5	To learn theorems on Trees and their Applications to Computer Science.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Mathematical logic:** Connections- well formed formula- Tautology- Equivalence of formulas- Tautological implications- Duality law- Normal forms- Predicates- Variables- Quantifiers-Free and Bound Variables- Theory of Inference for Predicate Calculus.	1	1
	Instructional Hours		**15**
II	**Relations and Functions:** Composition of relations- Composition of functions- Inverse functions- one-to-one, onto, one-to-one& onto, into functions- Permutation function- Growth of functions.	1	2
	Algebraic structures: Semi groups-Free semi groups- Monoids- Groups- Sets- Cosets- Normal subgroups- Homomorphism.	1	3
	Instructional Hours		**15**
III	**Grammar:** Types of grammar-Regular grammar- Context free and sensitive grammars- Regular expressions.	1	3
	Formal languages and Automata: Finite State Machine –Finite State Automata.	1	6
	Instructional Hours		**15**
IV	**Lattices and Boolean Algebra:** Partial Ordering, Poset- Lattices, Boolean Algebra, Boolean functions, Theorems, Minimization of Boolean functions.	1	4
	Instructional Hours		**15**

V	**Graph Theory:** Directed and Undirected graphs- Paths - Reachability – Connectedness - Matrix representation, Euler Paths, Hamiltonian Paths. **Trees**: Binary tree -Simple theorems- Applications in Computer Science.	1	5
		Instructional Hours	**15**
		Total Hours	**75**

Text Book:

1. J.P. Tremblay and R. Manohar, **Discrete Mathematical Structures with applications to Computer Science**, Mc.Graw Hill, 1975.

Unit – I : Chapter 1, Sections- 1.2.1 to 1.2.4, 1.2.7 to 1.2.11, 1.3.1 to 1.3.5, 1.5.1 to 1.5.4, 1.6.4
Unit – II : Chapter 2, Sections - 2.3.5, 2.3.7, 2.4.2, 2.4.3.
Chapter 3, Sections - 3.2.1 to 3.2.3, 3.5.1 to 3.5.4
Unit –III : Chapter 3, Sections - 3.3.1, 3.3.2
Chapter 6, Section - 6.1
Unit- IV : Chapter 4, Sections - 4.1.1, 4.2.1, 4.2.2, 4.3.1, 4.3.2, 4.4.2
Unit –V : Chapter 5, Sections - 5.1.1 to 5.1.4

Reference Books:

1. N. C. H S. Iyengar and others , **Discrete Mathematics**,Vikas publishing house PVT. LTD,2008.
2. J.K. Sharma, **Discrete Mathematics**,Laxmi Publications Pvt. Ltd, 2011.
3. Narsingh Deo, **Graph Theory with applications to Engineering and Computer Science**, Prentice-Hall of India Pvt.Ltd, 2008.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	H	H
CO2	H	M	H	H
CO3	H	M	H	M
CO4	M	M	H	M
CO5	H	H	M	H

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCE503	Discipline Specific Elective I - C Finite Element Method		
Semester: V	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

It enables the students to learn the concepts of Finite Element Method and Matrix Algebra.

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Course Outcome:

CO1	To know the basic concepts of Finite Element Method.
CO2	To find the method of deriving Stiffness Matrix for Spring Elements
CO3	To understand the selection of Approximation Functions for displacements
CO4	To understand the concepts of Matrix Algebra
CO5	Evaluating simultaneous Linear Equations

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Introduction:** The Basic concepts of the Finite Element Method-General Comments-Approximation of the Circumference of a Circle.- Approximation Determination of the Center of Mass- Solution of the Differential Equation.	1	1
	Instructional Hours		**15**
II	**Integral Formulations:** Need for Weighted – Integral Forms- Boundary , Initial and Eigen value Problems-Functional. **Weak Formulation of Boundary Value Problems :** Introduction – Weighted - Integral and weak Formulations – Linear and Bilinear Forms and Quadratic Functionals-Examples.	1	2
	Instructional Hours		**15**
III	**Second Order Boundary Value Problems:** Introduction- Basic Steps of Finite Element Analysis-Model Boundary Value Problem-Derivation of Finite Element Equations-Solution of Equation. **Applications:** Heat Transfer.	1	3
	Instructional Hours		**15**
IV	**Eigen Value Problems:** Introduction-Formulation of Eigen Value Problems-Finite Element Models-Applications.	1	6
	Instructional Hours		**15**

V	**Numerical Integration:** Natural Coordinates-Isoparametric Formulations-Numerical Integration-Newton's Cotes Integration.	1	7
	Interpolation Functions: Library of Finite Elements and Interpolation Functions-Introduction-Triangular Elements.	1	9
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. J. N. Reddy, **Introduction to Finite Element Method,** McGraw-Hill Publications, Second Edition, 1993.

Unit – I : Chapter 1, Section 1.3.1-1.3.4

Unit – II : Chapter 2, Section 2.1, 2.2.1, 2.2.3, 2.3

Unit –III : Chapter 3, Section 3.1, 3.2.1, 3.2.3, 3.2.6, 3.3.1

Unit- IV : Chapter 6, Section 6.1

Unit –V : Chapter 7, Section 7.1.2, 7.1.4, 7.1.5 (Newton's Cotes Method)

Chapter 9, Section 9.1.1, 9.1.2.

Reference Book:

1. Daryl. L. Logan, **A first Course in the Finite Element Method**, Rahul print O Pack, Delhi, 2007.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	M	H
CO2	M	M	H	H
CO3	M	H	H	M
CO4	M	H	M	M
CO5	H	M	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U4MCS503	Skill Based Paper III Operations Research I		
Semester: V	Credits: 3	CIA : 20 Marks	ESE : 55 Marks

Course Objective:

It enables the students to use the Mathematical knowledge in optimal use of resources.

Course Outcome:

CO1	To formulate models to solve Linear Programming Problem.
CO2	To solve Linear programming problems using Artificial variable techniques .
CO3	To find optimum solution for Transportation and Assignment problems.
CO4	To calculate the Critical Path and expected duration for a project.
CO5	To analyze the Decision making environment.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 3**

Unit	Description	Text Book	Chapter
I	Basics of O.R – Definition of O.R – Characteristics of O.R - Scientific methods in O.R – Necessity of O.R in Industry – O.R and Decision Making – Scope of O.R in Modern Management – Uses and limitations of O.R.	1	1
	Linear Programming Problem – Formulation of L.P.P – Graphical solutions of L.P.P, Simplex Method – Problems only	1	2,3
	Instructional Hours		**9**
II	Charnes Penality Method (or) Big – M Method , Two Phase Simplex method Duality in L.P.P – Concept of duality , Duality and Simplex Method – Problems only	1	3,4
	Instructional Hours		**9**
III	The Transportation Problems – Basic feasible solution by L.C.M – NWC- VAM - optimum solutions – unbalanced Transportation problems.	1	6
	The Assignment Problems – Assignment algorithm – optimum solutions – Unbalanced Assignment Problems	1	7
	Instructional Hours		**9**
IV	Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM.	1	21

	PERT – PERT calculations		
	Instructional Hours		**9**
V	Decision Analysis – Decision Making environment – Decisions under uncertainty – Decisions under certainty -Decision under risk – Decision – Tree Analysis	1	16
	Instructional Hours		**9**
	Total Hours		**45**

Text Book:

1. Kantiswarup, P. K. Gupta, Man Mohan, **Operations Research** , S. Chand & Sons, Education Publications, New Delhi, 12th Revised Edition.

Unit – I : Chapter 1
Chapter 2, Sections 2.1 to 2.6
Chapter 3, Sections 3.1 to 3.3

Unit – II : Chapter 3, Sections – 3.5 and 3.6
Chapter 4, Sections 4.1 to 4.3, 4.5, 4.7

Unit –III : Chapter 6, Sections – 6.1 to 6.9
Chapter 7, Sections 7.1 to 7.3

Unit- IV : Chapter 21

Unit –V : Chapter 16, Sections – 16.1 to 16.5

Reference Books:

1. Hamdy A Taha, **Operations Research**, Prentice Hall of India Pvt. Ltd., 2008

2. J K Sharma, **Operations Research,** Theory and Applications, Macmillan India Ltd., 2008

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	H
CO2	M	M	H	H
CO3	M	M	H	H
CO4	M	M	H	M
CO5	H	M	H	H

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCC620	Core Paper XX Complex Analysis		
Semester: VI	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

This course is aimed to provide an adequate knowledge for the students to learn Complex number system, Complex function and Complex Integration.

Course Outcome:

CO1	To learn about Analytic function and conditions for Differentiability.
CO2	To understand the concepts of Bilinear transformation and its applications.
CO3	To evaluate complex integration along SCRO curves.
CO4	To gain knowledge about the types of Singularities and their applications.
CO5	To evaluate definite integrals using Residue Theorem.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Analytic function:** Limit of a function- Continuity of a function-Uniform Continuity-Differentiability and Analyticity of a function - Necessary and Sufficient condition for differentiability - C-R equations in Polar Co-ordinates – Harmonic functions.	1	4, 6
	Instructional Hours		**18**
II	Bilinear Transformation – Cross Ratio – Circles and Inverse points - Fixed Points - Transformation which map real axis to real axis – Unit circle to unit circle - Conformal Mapping.	1	7
	Instructional Hours		**18**
III	Complex Integration-Simple Rectifiable Oriented Curve- Integration of Complex functions- Simple integrals using definition-Definite Integrals-Interior and Exterior of Closed Curve-Simply Connected region- Cauchy's Fundamental Theorem – Cauchy's Integral formula –Derivatives of analytic function-Morera's Theorem – Cauchy's inequality – Multiply Connected region-Liouville's Theorem – Fundamental Theorem of Algebra.	1	8
	Instructional Hours		**18**
IV	Taylor's Series – Zeros of an Analytic Function-Laurent's Series – Singular points – Types of Singularities – Poles - Properties of singularities – Determination of nature of singularities-Nature of singularity at infinity.	1	9
	Instructional Hours		**18**

V	Argument Principle – Residue Theorem- Rouche's Theorem- Calculus of Residue – Evaluation of definite integrals.	1	10, 11
	Instructional Hours		**18**
		Total Hours	**90**

Text Book:

1. Durai Pandian & Laxmi Durai Pandian, **Complex Analysis**, Emerald Publishers, Reprint, 2003.

Unit – I : Chapter 4 & Chapter 6 : Section 6.12
Unit – II : Chapter 7
Unit –III : Chapter 8 : Sections – 8.1 to 8.11
Unit- IV : Chapter 9
Unit –V : Chapter 10 & Chapter 11 : Section- 11.1

Reference Books:

1. T. K. M. Pillai & S. Narayanan, **Complex Analysis, S.V**iswanathan (Printers & Publishers), Pvt.Ltd, 1997.
2. A. S. Arumugam & A.Thangapandi Issac .A , A.Somasundaram, **Complex Analysis**, Scitech publications (India) Pvt .Ltd., Chennai.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	M	H
CO2	M	M	H	H
CO3	M	H	M	H
CO4	M	H	M	H
CO5	M	M	M	H

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCC621	Core Paper XXI MATLAB		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE : 75 Marks

Course Objective:

To give a comprehensive idea about the applications of Mathematics with Computers and to enrich the skills in Computing Mathematics using MATLAB.

Course Outcome:

CO1	To remember elementary math built in functions.
CO2	To create arrays and to execute add & delete elements.
CO3	To know the mathematical operations with arrays and MATLAB built in math functions.
CO4	To understand fitting polynomial curves for the given functions.
CO5	To solve ordinary differential equations using MATLAB applications.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Starting with MATLAB.** Starting MATLAB, MATLAB Windows - Working in the Command Window - Arithmetic Operations with Scalars - Display Formats. Elementary Math Built-in Functions - Defining Scalar Variables - Examples of MATLAB Applications.	1	1
	Instructional Hours		**18**
II	**Creating Arrays.** Creating a one-dimensional Array- Creating a two-dimensional array-The Transpose Operator- Array Addressing- Using a Colon- Adding Elements to Existing Variables- Deleting elements- Built- in functions for Handling Arrays.	1	2
	Instructional Hours		**18**
III	**Mathematical Operations with Arrays.** Addition and Subtraction – Array Multiplication – Array Division- Element-by-Element Operations – Using Arrays in MATLAB Built-in Math Functions.	1	3
	Two - Dimensional Plots	1	5
	Instructional Hours		**18**
IV	**Polynomials, Curve Fitting and Interpolation.** Polynomials - Curve Fitting.	1	8
	Instructional Hours		**18**

V	Solving an equation with one variable - Finding a minimum or a maximum of a Function - Numerical Integration - Ordinary Differential Equations - Examples of MATLAB applications.	1	10
	Instructional Hours		**18**
		Total Hours	**90**

Text Book:

1. Amos Gilat , **MATLAB an introduction with Applications**, Wiley India, Reprint 2007.

Unit-I : Chapter 1, Sections- 1.1 to 1.6, 1.8

Unit-II : Chapter 2, Sections - 2.1 to 2.9

Unit-III : Chapter 3, Sections- 3.1 to 3.5

Unit-IV : Chapter 8, Sections - 8.1, 8.2

Unit-V : Chapter 10, Sections - 10.1 to 10.5

Reference books:

1. Stephen J. Chapman , **MATLAB Programming for Engineers**, Third Edition
2. Duane Hansel man and Bruce Littlefield, **Mastering MATLAB ,** Pearson Education , 2012

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	S	H	S	H
CO2	S	S	H	S
CO3	M	M	S	S
CO4	M	S	S	M
CO5	H	S	H	H

S-Strong; H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCP622	Core Paper XXII Programming using MATLAB – Practical		
Semester: VI	Credits: 2	CIA: 20 Marks	ESE : 30 Marks

Course Objective :

To prefer the students for solving Mathematical problems using MATLAB.

Course Outcome:

CO1	To create MATLAB Program to perform Mathematical operations and to calculate statistical values.
CO2	To solve Mathematical problems using MATLAB tools.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 4**

S. No	Programs List
1.	Write a MATLAB program for Matrix Operations
2.	Plot the functions and derivatives using MATLAB
3.	Write a MATLAB program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data
4.	Find the Sum of the Series Using MATLAB.
5.	Using MATLAB, solve system of Linear Equations.
6.	Write a MATLAB program for curve fitting of polynomials and functions.
7.	Numerical Integration using MATLAB.
8.	Write a MATLAB Program to solve Ordinary Differential Equation
	Total Hours 60

Tools for Assessment (20 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
3	3	4	4	3	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE604	Discipline Specific Elective II - A Web Designing & Java		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective:

To enable the students to study HTML tags, Java fundamentals, Class, Packages, Exception Handling, Threads and Applets.

Course Outcome:

CO1	To understanding the basic concept of HTML and create the documents.
CO2	To apply the concept of Forms and controls.
CO3	To gain the basic knowledge in Java language and operators.
CO4	To analyze about the classes and packages.
CO5	To apply the concept of Threads and synchronization in Applets.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	Introduction – Basic Structure of an HTML Document – Creating , Saving HTML Document – Opening HTML Document in a Web Bowser – Modifying Background – Specifying Metadata	1	1
	Creating Headings, Paragraph, Horizontal Rule, Subscript and Superscript, Aligning Text, Formatting Text, Grouping Text, Marquee, Commenting the Text	1	2
	Instructional Hours		**18**
II	Working with Lists, Tables, Frames	1	3
	Working with Links, Images, Multimedia	1	4
	Working with HTML Forms and Controls	1	5
	Instructional Hours		**18**
III	Introduction to Java language – Constants, variables, Data Types.	2	3,4
	Operators and Expressions – Flow Control	2	5,6
	Instructional Hours		**18**
IV	Classes - Packages and Interfaces	2	7, 8
	Exception Handling	2	10
	Instructional Hours		**18**
V	Threads and synchronization	2	11
	Applet programming, Graphics Programming, Input / Output	2	13,15

Instructional Hours	**18**
Total Hours	**90**

Text Books:

1. Harley Hahn, **The Internet – Complete Reference**, second edition, Tata McGraw Hill, 1996.
2. Patric Naughton, **Java Hand Book**, Tata McGraw Hill, 1996.

Reference Books:

1. David Mercer, HTML, **Introduction to Web page Design and Development**, Tata McGraw Hill, 2008
2. Herb Schildt, **Java Programing Cook book,** Tata McGraw Hill, 2008

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	H
CO2	H	H	M	M
CO3	M	M	H	M
CO4	M	H	H	M
CO5	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE605	Discipline Specific Elective II - B Automata Theory and Formal Languages		
Semester: VI	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

To understand the notion of effective computability by studying Finite state Automata, Grammars and Push down Automata.

Course Outcome:

CO1	To understand about the managerial concepts like decision making, optimization.
CO2	To understand about the optimal solutions.
CO3	To apply the Network representation in Mathematics.
CO4	To solve mathematical problems using Graphs.
CO5	To understand the concept of Push down automata.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	Introduction – Phase Structure languages.	1	2
	Instructional Hours		**18**
II	Closure operations.	1	3
	Instructional Hours		**18**
III	Context free languages	1	4
	Instructional Hours		**18**
IV	Finite state automata.	1	5
	Instructional Hours		**18**
V	Push down automata.	1	6
	Instructional Hours		**18**
	Total Hours		**90**

Text Book:

1. Rani Sriomoney, **Formal Languages and Automata**, Christian Literary Society, Madras-3 . Revised edition 1984.

Unit – I : Chapter 2, Sections 2.1- 2.4

Unit – II : Chapter 3, Sections 3.1-3.7

Unit –III : Chapter 4, Sections 4.1-4.4

Unit- IV : Chapter 5, Sections 5.1-5.9

Unit –V : Chapter 6, Sections 6.1-6.6

Reference Books :

1. Hopcrot and Stillman, **Formal languages and their Relation Automata**, Addision Wesley.
2. R. Y. Kulin, **Automata theory**, Machines and Languages, McGraw Hill.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	H
CO2	S	S	S	S
CO3	M	M	S	S
CO4	M	S	S	M
CO5	H	M	S	H

S-Strong; H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE606	Discipline Specific Elective II - C Fuzzy Logic and Neural Networks		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE : 75 Marks

Course Objective:

This paper describes the concept of Fuzzy Set Theory, Fuzzy Systems, Fundamental of Neural Networks and Genetic Algorithms.

Course Outcome:

CO1	To understand the concept of Fuzzy sets and relations.
CO2	To gain the knowledge of Fuzzy systems.
CO3	To know the Defuzzification Methods and their applications.
CO4	To learn the Neural network model.
CO5	To Understand the fundamentals of Genetic algorithms.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Fuzzy Set Theory:** Fuzzy and Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations.	1	6
	Instructional Hours		**18**
II	**Fuzzy Systems:** Crisp Logic, Predicate Logic, Fuzzy Logic.	1	7
	Instructional Hours		**18**
III	**Fuzzy Systems:** Fuzzy Rule based System, Defuzzification Methods. **Applications**: Greg Viot's Fuzzy Cruise Controller, Air Conditioner Controller.	1	7
	Instructional Hours		**18**
IV	**Fundamentals of Neural Networks:** Basic concepts of Neural networks, Human Brain, Model of Artificial Neuron, Neural Network Architectures, History of Neural Network Research, Early Neural Network Perception.	1	2
	Instructional Hours		**18**
V	**Fundamentals of Genetic Algorithms:** Genetic Algorithms, Basic Concepts, Creation of off springs, Working principle, Encoding, Fitness Function.	1	8
	Instructional Hours		**18**
	Total Hours		**90**

Text Book:

1. S .Rajasekaran, G.A Vijayalakshmi Pai ; **Neural Networks, Fuzzy Logic, and Genetic Algorithms, Synthesis and Applications,** PHI learning Private Limited, New Delhi, 2011.

Unit – I : Chapter 6 , Sections 6.1- 6.5
Unit – II : Chapter 7, Sections 7.1-7.3
Unit –III : Chapter 7, Sections 7.4-7.6
Unit- IV : Chapter 2, Sections 2.1-2.9
Unit –V : Chapter 8, Sections 8.1-8.6

Reference Books:

1. M. Ganesh, **Introduction of Fuzzy sets & Fuzzy logic**, PHI learning Pvt. Ltd., New Delhi.
2. Chennakesava R. Alavala, **Fuzzy logic & Neural networks Basic concepts & Application**, New Age inner (P) Ltd Publishers,2008.
3. H. J. Zimmermann, **Fuzzy Set Theory and its Applications**, Allied Publishers, Chennai, 1996
4. A. Kaufman, **Introduction to the theory of Fuzzy subsets**, Vol. I, Academic Press, New York, 1975.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	M	H
CO2	H	M	M	M
CO3	M	M	H	M
CO4	M	H	M	M
CO5	H	M	H	H

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
18U3MCY607	Discipline Specific Elective III - A Web Designing & Java Practical		
Semester: VI	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective:

To enable the students to apply the HTML tags for web page creation and use the Java statements learnt, to write programs.

Course Outcome:

CO1	To run the webpage designed using HTML code
CO2	To create HTML Programs using function overloading and inheritance

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

S. No	Programs List
1.	Create a web page to display your bio data using different font, colour and background tag.
2.	Create a web page using Heading Tags and Paragraph tags
3.	Create a web page for advertising a Product
4.	Create web pages using HTML to display ordered and unordered list of a departmental store.
5.	Create a document using formatting and alignment tags in HTML.
6.	Create a web page for a travel agency and display image and text using HTML tag.
7.	Create a web page to display the class timetable using <table> tag.
8.	Create web pages for a business organization using HTML frames.
9.	Create a web site of your department with minimum links using HTML.
10.	Create a web page for a multi specialty hospital.
11.	Write a Java program to print the triangle of numbers.

12.	Write a Java program to accept values and find the given no. is even or odd.
13.	Write a Java program to calculate the area of Circle and Rectangle.
14.	Write a Java program to find the Factorial of a given number using recursion.
15.	Write a Java program to sort the numbers in an array.
16.	Write a Java program to multiply two matrices.
17.	Write a Java program to calculate standard deviation
18.	Write a program which creates and displays a message on the windows.
19.	Write a program to draw several shapes in the created window.
20.	Write a Java program to illustrate Multithreading.
	Total Hours 75

Tools for Assessment (40 Marks)

Program Execution	Creativity	Test I	Test II	Observation	Attendance	Total
5	5	10	10	7	3	40

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

H-High; M-Medium.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE608	Discipline Specific Elective III - B Graph Theory		
Semester: VI	Credits: 4	CIA:25 Marks	ESC:75 Marks

Course Objective:

To enable the students to understand and apply the fundamental concepts of Graph Theory.

Course Outcome:

CO1	To gain the knowledge about graphs and Isomorphism of graphs.
CO2	To know the operations on Graphs.
CO3	To understand the concepts of trees and spanning trees.
CO4	To remember the concept of Fundamental Circuits and Cut-Sets.
CO5	To evaluate directed path and adjacency matrix of a Digraph.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Graphs –Incidence and Degree – Isolated vertex, Pendant vertex and Null Graph	1	1
	Isomorphism- Sub graphs - walks, paths and Circuits	1	2
	Instructional Hours		**15**
II	Connected Graphs, Disconnected Graphs, and Components - Euler Graphs – Operations on Graphs – Hamiltonian Paths and Circuits.	1	2
	Instructional Hours		**15**
III	Trees – Some Properties of Trees- Pendant Vertices in Tree – Distance and Centers in a tree- Spanning Trees- Rooted and Binary Tree.	1	3
	Instructional Hours		**15**
IV	Cut- Sets – Fundamental Circuits and Cut-Sets	1	4
	Incidence Matrix – Sub matrices of A(G)	1	7
	Instructional Hours		**15**
V	Directed graphs – Directed Paths and Connectedness- Euler Digraphs –Matrices A, B and C of Digraphs- Adjacency Matrix of a Digraph.	1	9
	Instructional Hours		**15**
	Total Hours		**75**

Text Book:

1. Narsingh Deo, **Graph theory** with applications to Engineering and Computer Science, Prentice-Hall of India Pvt.Ltd, 2008.

Unit 1 : Chapter 1, Sections -1.1 to 1.5, Chapter 2, Sections- 2.1 to 2.4

Unit 2 : Chapter 2, Sections -2.5 to 2.7, 2.9

Unit 3 : Chapter 3, Sections - 3.1 to 3.5 & 3.7

Unit 4 : Chapter 4, Sections - 4.1 to 4.4, Chapter 7, Sections - 7.1, 7.2

Unit 5 : Chapter 9, Sections - 9.1 to 9.5, 9.8, 9.9

Reference Books:

1. J.A.Bondy and U.S.R. Murty , **Graph Theory with Applications**.

2. F. Harary , **Graph Theory**, Addison-Wesley, (Second Printing) 1971.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	M	H
CO2	H	H	H	H
CO3	L	M	H	M
CO4	M	H	M	H
CO5	H	H	L	H

H-High; M-Medium; L-Low.

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title		
19U3MCE609	Discipline Specific Elective III - C Linear Algebra		
Semester: VI	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

To enable the students to be familiar with the concepts of basis, dimension of Vector Spaces, Matrices and Inner Products.

Course Outcome:

CO1	To understand the concept of Linear Independence and Dependence.
CO2	To understand the concept of Basis and Dimension
CO3	To apply the Elementary Transformation of matrices
CO4	To analyse the Consistency and Inconsistency of a system of linear equations.
CO5	To gain knowledge about Orthogonality and Gram Schmidt Orthogonalization process.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Vector Spaces:** Definition and examples- Subspaces- Linear Transformations-Fundamental Theorem of Homomorphism-Span of a set- Linear Independence and Dependence.	1	5
	Instructional Hours		**15**
II	**Basis and Dimension:** Rank and Nullity-Singular and Nonsingular Linear Transformations- Matrix of Linear Transformation.	1	5
	Instructional Hours		**15**
III	**Matrix:** Types of Matrices- Inverse of a matrix- Elementary Transformations- Canonical form of a Matrix.	1	7
	Instructional Hours		**15**
IV	**Simultaneous Linear Equations**-Matrix form of a set of Linear equations- Augmented matrix- Consistency and Inconsistency of a system of linear equations- Characteristic Equation and Cayley-Hamilton Theorem- Eigen Values and Eigen Vectors.	1	7
	Instructional Hours		**15**
V	**Inner Product spaces:** Definition and examples- Schwartz's Inequality-Orthogonality-Gram Schmidt Orthogonalization Process- Orthogonal Complement- Bilinear forms –Quadratic forms.	1	6

Instructional Hours	15
Total Hours	75

Text Book:

1. S.Arumugam and A.Thangapandi Isaac, **Modern Algebra, Scitech publications** (India) pvt.ltd.,Chennai, Edition 2007.
   Unit – I : Chapter 5, Sections- 5.1 to 5.5.
   Unit – II : Chapter 5, Sections – 5.6 to 5.8
   Unit –III : Chapter 7, Sections – 7.2 to 7.4
   Unit- IV : Chapter 7 Sections- 7.6 to 7.8
   Unit –V : Chapter 6, Sections- 6.1 to 6.3 , Chapter 8,Sections-8.1 to 8.2

Reference Books:

1. A.R.Vashista,**Modern Algebra**, Krishna prakasan Mandir, 1994-95.
2. I.N.Herstein**, Topics in Algebra,**John wiley & sons,2003.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Problem Solving Skill	Attendance	Total
5	5	6	3	3	3	25

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	M	H	H	H
CO2	H	H	M	H
CO3	H	M	H	H
CO4	M	M	H	M
CO5	M	H	H	H

H-High; M-Medium

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4MC3ED1	Extra Departmental Course I Mathematics for Competitive Examinations	
Semester: III	Credits: 2	ESE: 50 Marks

Course Objective:

This course helps the students to increase their problem solving ability. It presents applications and methods to solve quantitative problems using short cut methods.

Course Outcome:

CO1	To recall the method of simplification.
CO2	To gain knowledge in directional problem.
CO3	To understand problems on Time and Work .
CO4	To develop the logical reasoning skills.
CO5	To find the blood relations.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	Numbers , L.C.M. & H.C.F. , Simplification (BODMAS), Number series	1,2	1,2,4,3
	Average	1	6
	Instructional Hours		**6**
II	Ratio and proportion	1	12
	Directions.	2	8
	Instructional Hours		**6**
III	Clocks, Calendar,	1	28,27
	Time and work	1	15
	Instructional Hours		**6**
IV	Seating/placing arrangement	2	6
	Sequential output Tracing, permutations and combinations , Probalility(Simple Problems)	2,1	7,30
	Instructional Hours		**6**
V	Coding and Decoding	2	4
	Blood relations	2	5
	Instructional Hours		**6**

Total Hours	**30**

Text Books:

1. Dr. R. S. Agarwal, **Quantitative Aptitude** , S. Chand, 7th Edition, 2008

2. Dr. R. S. Agarwal , **A Modern approach to Verbal and Non-Verbal Reasoning** , S. Chand, 2008.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	H	H	M
CO2	M	H	M	M
CO3	M	H	M	H
CO4	H	H	M	M
CO5	M	H	H	M

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
19U4MC3ED2	Extra Departmental Course II- Statistics for Competitive examinations	
Semester: III	Credits: 2	ESE: 50 Marks

Course Objective:

This Course presents applications and methods to solve Statistical Problems using Short cut method.

Course Outcome:

CO1	To remember the concept of averages.
CO2	To understand and apply the measurement concept in statistical data.
CO3	To learn the concepts of Measures of Dispersion.
CO4	To gain confidence to apply the short cuts in Competitive Examinations.
CO5	To find and solve the problems in Data Interpretation.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	Averages –Changes in values and in averages – Combine two or more groups – Weighted averages by deviation methods	1	11
	Instructional Hours		**6**
II	Measures of central tendency –Arithmetic mean – Geometric mean – Harmonic mean- Median- Mode – The properties – Empirical formula.	1	20
	Instructional Hours		**6**
III	Measures of Dispersion – Range –Quartile deviation- Mean deviation – Standard deviation.	1	20
	Instructional Hours		**6**
IV	Probability – Definition –Laws of Probability- Mutually Exclusive Event – Independent Event – Equally likely event – Exhaustive event – Cards – Expected Values.	1	19
	Instructional Hours		**6**
V	Data Interpretation – Tabulation- Bar Graphs – Pie charts – Line graphs.	2	Section II
	Instructional Hours		**6**
	Total Hours		**30**

Text Book:

1.Trishna Knowledge systems , Quantitative Aptitude, pearson education, 2008
2. R.S. Aggarwal , Quantitative Aptitude, S.Chand &Co New Delhi ,2008.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M
CO3	H	M	H	H
CO4	H	M	M	M
CO5	M	H	H	M

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
18UMCSS01	Self study Paper- Reasoning	
Semester: II-V	Credit: 2	ESE: 50 Marks

Course Objective:

This Course helps the students to increase their problem solving ability. It presents applications and methods to solve problems in verbal and Non- verbal Reasoning.

Course Outcome:

CO1	To Enhance the reasoning ability.
CO2	To Gain confidence to appear for Competitive Examinations.

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	Series Completion - Blood relation.	1	1,5
	Instructional Hours		**4**
II	Direction sense Test – Data Sufficiency.	1	8,17
	Instructional Hours		**5**
III	Coding and Decoding – Logical Venn diagrams.	1	4,9
	Instructional Hours		**5**
IV	Logic – Cause and effect Reasoning.	1	Section II 1,8
	Instructional Hours		**5**
V	Analytical Reasoning – Completion of incomplete Pattern.	1	Part II 4,8
	Instructional Hours		**5**
	Total Hours		**24**

Text Book:

1. Dr. R. S. Agarwal , **A Modern approach to Verbal and Non-Verbal Reasoning** S. Chand and Co., 2008.

Reference Books:

1. Dr. R. S. Agarwal , **A New approach to Verbal and Non-Verbal Reasoning,** Bright Publications, New Delhi.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

Course Designed by	Verified by HOD	Checked by	Approved by

Course Code	Title	
18UMCSS02	Self study Paper - Vedic Mathematics	
Semester: II -V	Credit: 2	ESE: 50 Marks

Course Objective:

This Course helps the students to increase their problem solving ability using short cuts in Vedic methods.

Course Outcome:

CO1	To Apply the Vedic Sutras to solve Arithmetic problems
CO2	To Gain confidence to apply the short cuts in Competitive Examinations

Offered by: Mathematics

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	Miscellaneous Simple Method, Criss-Cross System of Multiplication.	1	1,2
	Instructional Hours		**4**
II	Squaring Numbers, Cube Roots of Perfect Cubes, Square Roots of Perfect Square.	1	3,4,5
	Instructional Hours		**5**
III	Base Method for Multiplication, Base Method for Squaring.	1	6,7
	Instructional Hours		**5**
IV	Magic Squares, Dates & Calendar	1	9,10
	Instructional Hours		**5**
V	General Equation, Simultaneous Linear Equation	1	11,12
	Instructional Hours		**5**
	Total Hours		**24**

Text Book:

1. Dhaval Bathia ,**Vedic Mathematics made Easy**, Jaico Publishing House, Mumbai, 2008

Reference Books:

1. Jagadguru Swami Sri Bharati Krshna Tirthaji Maharaja, **Vedic Mathematics**, Motilal

Banarsidass Publishers Pvt. Ltd., 2008

2. The Problem Solver, **Vedic Mathematics,** Maple Press, Noida

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	H	M	H	M
CO2	M	H	H	M

Course Designed by	Verified by HOD	Checked by	Approved by