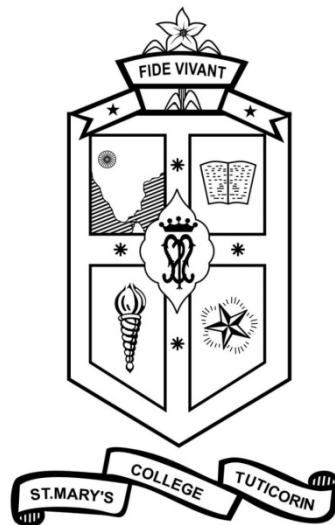


ST. MARY'S COLLEGE (Autonomous)

(Re-accredited with 'A+' Grade by NAAC)

Thoothukudi-628001, Tamil Nadu

(Affiliated to Manonmaniam Sundaranar University)



Syllabus

B.Sc. Mathematics

School of Computing Sciences

Outcome Based Curriculum

(W.e.f.2018)

Preamble

Mathematics, the foundation of all sciences is a subject which offers limitless scope for diversification in higher education. The improvements and achievements in various fields are the gift of Mathematics. The world of education without mathematics would be non-existent. The fields of Information Technology, Social Research and Economic forecasts will not be successful but for the effective application of Mathematics. The demand for courses in Mathematics is bound to be consistent, continual and increasing.

Vision

To promote and support a comprehensive, innovative and dynamic learning environment that meets the changing needs of a diverse global student population.

Mission

- To provide an exemplary mathematics program that prepares students to be life-long learners and responsible, numerate citizens.
- To enhance the students logical, reasoning, analytical and problem solving skills.
- To provide meaningful support services, responds to the changing environment of mathematics education.
- To promote effective instructional strategies with students actively participating in the learning process.

Programme Outcome

PO.No	Upon completion of B.Sc Degree programme , the graduates will be able to
PO - 1	apply the acquired knowledge of fundamental concepts in the field of science and to find solutions to various problems.
PO - 2	inculcate innovative skills and team – work among students to meet societal expectations.
PO - 3	perform analysis to assess, interpret, and create innovative ideas through practical experiments.
PO - 4	facilitate to enter multidisciplinary path to solve day-to-day scientific problems.
PO - 5	carry out fieldworks and projects, both independently and in collaboration with others, and to report in a constructive way.
PO - 6	improve communication ability and knowledge transfer through ict aided learning integrated with library resources.
PO - 7	transfer the knowledge to the other stakeholders through extensive community development programme.
PO - 8	attain competency in job market / entrepreneurship.

Programme Specific Outcome

PSO No.	Upon completion of the B.Sc. Mathematics program, students will be able to
PSO-1	understand the foundations of mathematics and perform basic computations in higher mathematics.
PSO-2	understand the power of abstraction and generalization and to carry out investigative and mathematical work with independent judgement.
PSO-3	communicate mathematical ideas, develop proficiency in the analysis of problems and use mathematical or other appropriate techniques to solve them.
PSO-4	apply mathematical ideas to model real-world problems.
PSO-5	apply rigorous, analytic, highly numerate approach to analyze, execute tasks and solve problems in daily life and at work.
PSO-6	appreciate the role of mathematical proof as a means of conveying mathematical knowledge.
PSO-7	carry out objective analysis and prediction of quantitative information with independent judgement.
PSO-8	create, use and analyze graphical representation of mathematical relationships

Course Structure (w.e.f. 2018)
Semester –I

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil /	18ULTA11	இக்கால இலக்கியம்: செய்யுள், இலக்கணம், உரைநடை, சிறுகதை, இலக்கியவரலாறு	6	4	40	60	100
	French	18ULFA11	Preliminary French Course					
II	General English	18UGEN11	Prose,Poetry,Extensive Reading & Language Study - I	6	4	40	60	100
III	Core I	18UMAC11	Classical Algebra	5	4	40	60	100
	Core II	18UMAC12	Calculus	5	4	40	60	100
	Allied I Allied Practical	18UPHA11 18UPHAR1	Allied Physics I Allied Physics Practical	4 2	3	40	60	100
IV	Ability Enhancement Course	18UAVE11	Value Education	2	2	20	30	50
Total				30	21			

Semester II

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil /	18ULTA21	சமய இலக்கியங்களும், நீதி இலக்கியங்களும்: செய்யுள்,இலக்கணம், உரைநடை, வாழ்க்கை வரலாறு, இலக்கிய வரலாறு	6	4	40	60	100
	French	18ULFA21	Basic French Course					
II	General English	18UGEN21	Prose,Poetry,Extensive Reading & Language Study - II	6	4	40	60	100
III	Core III	18UMAC21	Analytical Geometry of Three Dimensions	5	4	40	60	100
	Core IV	18UMAC22	Differential Equations	5	4	40	60	100
	Allied II Allied Practical	18UPHA21 18UPHAR1	Allied Physics II Allied Physics Practical	4 2	3 2	40	60	100
IV	Ability Enhancement Course	18UAEV21	Environmental Studies	2	2	20	30	50
Total				30	23			

Semester III

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil /	18ULTA31	காப்பிய இலக்கியம்: செய்யுள், இலக்கணம்,உரைநடை, சிறுகதை,இலக்கிய வரலாறு	6	4	40	60	100
	French	18ULFA31	Advanced French Course					
II	General English	18UGEN31	Prose, Poetry, Extensive Reading & Language Study - III	6	4	40	60	100
III	Core V	18UMAC31	Sequences and Series,Trigonometry	6	4	40	60	100
	Allied III	18UMMA31	Statistics I	3	3	40	60	100
	Allied IV	18UMMA32	Linear Programming	3	3	40	60	100
	Core Skill Based	18UMAS31	Numerical Aptitude and Arithmetic Ability	4	4	40	60	100
	NME I	18UMAN31	Mathematics for Competitive Examinations I	2	2	40	60	100
IV	Ability Enhancement Course	18UAWS31	Women's Synergy		2	20	30	50
	Self Study / On-line Course/ Internship (Optional)	18UMASS1	Foundation of Mathematics		+2		50	50
Total				30	26+2			

Semester IV

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil /	18ULTA41	சங்க இலக்கியம்: செய்யுள், இலக்கணம்,உரைநடை, வாழ்க்கைவரலாறு, இலக்கிய வரலாறு	6	4	40	60	100
	French	18ULFA41	Language through Literature					
II	General English	18UGEN41	Prose, Poetry, Extensive Reading & Language Study - IV	6	4	40	60	100
III	Core VI	18UMAC41	Real Analysis	6	4	40	60	100
	Allied V	18UMMA41	Statistics II	3	3	40	60	100
	Allied VI	18UMMA42	Discrete Mathematics	3	3	40	60	100
	Core Skill Based	18UMAS41	Math Type using LaTeX	4	4	40	60	100
	NME II	18UMAN41	Mathematics for Competitive Examinations II	2	2	40	60	100
IV	Ability Enhancement Course	18UAYM41	Yoga & Meditation		2	20	30	50
	Self Study / On-line Course/ Internship (Optional)	18UMASS2	Industrial Mathematics		+2		50	50
V	NCC, NSS & Sports				1			
	Extension Activities CDP				+1			
Total				30	27+3			

Semester V

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Core VII (Common Core)	18UCCC51	Computer Oriented Numerical Methods	6	4	40	60	100
	Core VIII	18UMAC52	Modern Algebra	5	4	40	60	100
	Core IX	18UMAC53	Modern Analysis	5	4	40	60	100
	Core X	18UMAC54	Operations Research	4	4	40	60	100
	Core Integral I	18UMAI51	Vector Calculus and Fourier Series	4	4	40	60	100
	Core Integral II	18UMAI52	Statistical Inference	4	4	40	60	100
IV	Common Skill Based	18UCSB51	Computers for Digital Era and Soft Skills	2	2	20	30	50
	Self Study or On-line Course (Compulsory)	18UMASS3	Astronomy	--	2			50
Total				30	28			

Semester VI

Part	Components	Sub. Code	Title of the Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Core XI	18UMAC61	Complex Analysis	6	4	40	60	100
	Core XII	18UMAC62	Linear Algebra	6	4	40	60	100
	Core XIII	18UMAC63	Mechanics	6	4	40	60	100
	Core Integral III	18UMAI61	Graph Theory	5	4	40	60	100
IV	Core Integral IV / Project	18UMAI62/ 18UMAP61	Coding Theory/ Project	7	4	40	60	100
Total				30	20			
Total				180	145+5			

Semester	Hours	Credits	Extra Credits
I	30	22	---
II	30	22	---
III	30	26	2
IV	30	27	3
V	30	26	--
VI	30	22	--
Total	180	145	5

Courses	Number of Courses	Hours / week	Credits	Extra Credits
Tamil	4	24	16	--
English	4	24	16	--
Core	12	64	48	--
Core Skill Based	2	8	8	--
Core Integral	4	19	16	--
Group Project	1	7	4	--
Allied	6	20T+4P	18T+2P	--
NME	2	4	4	--
Ability Enhancement Course	4	4 (4 Extra Hours)	8	--
Common Skill Based	1	2	2	--
NCC, NSS & Sports		--	1	
Extension Activities		--		1
Self Study Papers (Optional)	2	--		4
Self Study Papers (Compulsory)	1	--	2	--
Total	43	180	145	5

தமிழ்த் துறை தமிழ் பாடத்திட்டம் 2018 – 2021

பாடத்திட்டத்தின் நோக்கங்கள்

1. அனைத்து துறை மாணவர்களும் பயன்பெறும் வகையில் பாடத்திட்டம் வரையறை செய்யப்பட்டுள்ளது.
2. தமிழ் இலக்கிய கல்வியை எளிமையுடன் ஆழமாக்கிக் கற்பிக்கும் விதமாகத் தற்கால இலக்கியம் தொடங்கி, சங்க இலக்கியம் வரை கற்பித்தல்.
3. தமிழ் மொழியில் பிழையின்றி கற்கும் விதமாக எழுத்து, சொல் , பொருள், யாப்பு, அணி என இலக்கணத்தைக் பயிற்றுவித்தல்.
4. மாணவர்களின் நலன் கருதி இலக்கிய வரலாற்றுப் பகுதியானது செய்யுள் அமைப்பிற்கேற்ப வகைப்படுத்தப்பட்டு கற்பிக்கப்படுதல்

பயன்கள்

1. காலந்தோறும் வளர்ந்துவரும் தமிழ் கவிதைகளின் வடிவினையும், கருத்தோட்டத்தினையும் மாணவியர் அறிந்து கொள்வர்.
2. தமிழ் மொழியைப் பிழையின்றி எழுதவும் பேசவும் முடியும்.
3. தன்னம்பிக்கை உருவாகும்.
4. தகவல் தொடர்பு சாதனங்கள் தமிழ் வளர்ச்சிக்குப் பயன்படுவதை அறிந்து கொள்வர்.
5. படைப்பாற்றலை வளர்த்துக்கொள்வர்.
6. தமிழ் இலக்கியங்கள் அன்று முதல் இன்று வரை பெற்றுவரும் சிறப்பை உணர்வர்.
7. இலக்கிய வரலாற்றின் வழி, மொழியின் வளர்ச்சியையும் காலந்தோறும் மாறிவரும் இலக்கியங்களின் பல்வேறு வகைகளையும் தெரிந்து கொள்வர்.
8. துறைதோறும் தமிழ் மொழியின் வளர்ச்சியை அறிவர்.
9. சங்கம் வைத்து தமிழாய்ந்த மன்னர், புலவர், மக்கள் இவர்களின் வாழ்வியல் அறங்களைக் கண்டறிவர்.
10. பண்பாட்டுச் சிறப்பினை மொழியின் வழி அறிந்து தம் வாழ்வில் கடைபிடிப்பர்.
11. வேலைவாய்ப்பிற்கான தேர்வுகளில் திறமையுடன் பங்கேற்பர்.

SEMESTER - I			
Part-1 தமிழ் தாள் - 1 இக்கால இலக்கியம் செய்யுள், இலக்கணம், உரைநடை, சிறுகதை, இலக்கிய வரலாறு			
18ULTA11	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

Vision: மாணவியருக்கு நல்ல மதிப்பீடுகளைக் கற்பித்து, வாழ்வில் அவற்றைப் பின்பற்ற வழிவகுத்தல்.

Mission: இலக்கிய மாந்தரின் வாழ்க்கை அனுபவங்கள் மூலம் பிரச்சனைகளை எதிர்கொள்ளும் திறம், தன்னம்பிக்கை, ஆளுமைத்திறம், மொழிஅறிவு இவற்றை உருவாக்குதல்.

Course Outcome:

CO.No.	இப்பாடத்திட்டத்தின் மூலம், மாணவியர்	Cognitive Level
CO-1	பெண் சார்ந்த விடுதலை உணர்வை வளர்க்கிறது.	வளர்ச்சி
CO-2	இனம், சாதி குறித்த பாகுபாட்டிலிருந்து விடுதலை பெறும் வழிவகைகளைக் கற்றுக்கொடுக்கிறது.	நடைமுறைப்படுத்தல்
CO-3	இயற்கையைப் பேணுதற்கும் வாழ்வின் வளர்ச்சிநிலையை மேம்படுத்திக் கொள்ளுதற்கும் உதவுகிறது.	நடைமுறைப்படுத்தல்
CO-4	சமயநல்லிணக்கம், ஒற்றுமைஉணர்வு, இறைநம்பிக்கை இவற்றை உருவாக்குகிறது.	உருவாக்கம்
CO-5	மொழியை பிழையின்றி பேசவும் எழுதவும் உதவுகின்றது.	புரிதல் திறன் மேம்பாடு
CO-6	தனிமனித வாழ்க்கைச் சிக்கல்களை எதிர்கொள்ளும் நிலையை உருவாக்குகிறது	நடைமுறைப்படுத்தல்
CO-7	சமுதாய பிரச்சனைகளை எதிர்கொள்ளும் திறம் கிடைக்கிறது.	நடைமுறைப்படுத்தல்
CO-8	போட்டித் தேர்வுகளுக்குப் பயன்படும் வகையில் படைப்பாக்கத் திறனை வளர்க்க உதவுகிறது.	படைப்பாற்றல் திறன் மேம்பாடு

SEMESTER – I			
Part – I தமிழ்; Paper – 1 இக்கால இலக்கியம், செய்யுள், இலக்கணம், உரைநடை, சிறுகதை, இலக்கிய வரலாறு			
18ULTA11	Hrs/Week: 6	Hrs / Semester: 90	Credits: 4

அலகு- 1 செய்யுள் - 1 மணி

- | | |
|-----------------------------|-------------------|
| 1. மனதில் உறுதிவேண்டும் | - பாரதியார் |
| 2. ஒழுக்கம் விழுப்பம் தரும் | - பாரதிதாசன் |
| 3. ஐந்துபெரிது ஆறு சிறிது | - வைரமுத்து |
| 4. போட்டி | - அப்துல் ரகுமான் |
| 5. மனிதனும் இயற்கையும் | - சிற்பி |
| 6. நன்றிக்கடன் | - பா.விஜய் |
| 7. மேலாடை | - சுரதா |
| 8. கவிஞர்கள் கவனிக்க | - ஜெ.செல்வகுமாரி |
| 9. மாதவம் | - சக்திஜோதி |
| 10. ஹைக்கூ கவிதைகள் | |
| 11. நாட்டார் பாடல்கள் | |
| 1. விளையாட்டு | |
| 2. உழவும் தொழிலும் | |

அலகு-2 இலக்கணம் - 1 மணி

- எழுத்து
- எழுத்துப் பற்றிய விளக்கம். ஒரெழுத்து ஒருமொழி
 - முதலெழுத்துகள்.
 - சார்பெழுத்துகள்
 - சுட்டெழுத்துகள், வினாவெழுத்துகள்
 - மொழிமுதல் எழுத்துகள், மொழிஇறுதி எழுத்துகள்
 - வல்லினம் மிகும் இடங்கள், வல்லினம் மிகா இடங்கள்

அலகு- 3 உரைநடை - 1 மணி

- இலக்கியச் சாரல்
(கட்டுரை எண்கள் - 1, 2, 3, 8, 9, 10)
- ச.பாரிஜாதம்

அலகு- 4 சிறுகதை - 1 மணி

- | | |
|--------------------|---------------------|
| 1. அகிலன் | - தாய்ப்பசு |
| 2. புதுமைப்பித்தன் | - சாபவிமோசனம் |
| 3. அண்ணா | - செவ்வாழை |
| 4. ஜெயகாந்தன் | - அக்கினிப்பிரவேசம் |
| 5. இரா.கலாராணி | - மௌனப்போராளி |
| 6. ஜெயரதி அகஸ்டின் | - ஜோடிப் பொருத்தம் |

அலகு -5 இலக்கிய வரலாறு - 2 மணி

- புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
- சிறுகதையின் தோற்றமும் வளர்ச்சியும்
- நாட்டுப்புறப் பாடல்கள்

4. தகவல் தொடர்புசாதனங்களும் தமிழ் வளர்ச்சியும்
5. மொழிப்பயிற்சி : புதுக்கவிதை, சிறுகதை, பத்திரிகைக்கு செய்தி

SEMESTER – II			
Part-1 Tamil தாள் -2 சமயஇலக்கியங்களும் நீதி இலக்கியங்களும் செய்யுள், இலக்கணம், உரைநடை, வாழ்க்கை வரலாறு, இலக்கிய வரலாறு			
18ULTA21	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

Vision:

வாழ்வியல் நன்னெறிகளான மனிதநேயம், சமத்துவம் போன்றவற்றை வளர்த்துக் கொள்ள கற்றுக்கொடுத்தல்

Mission:

அறநெறியைக் கடைபிடிப்பதே நிலையானதும் நீடித்ததுமான நன்மையைத் தருவது என்பதைச் சான்றோரின் வாழ்க்கைநெறிகள் மூலம் உணரச்செய்தல், மொழிஅறிவு, இலக்கியஅறிவு இவற்றை வளர்த்துக் கொள்ளக் கற்றுக்கொடுத்தல்

Course Outcomes:

CO.No.	இப்பாடத்திட்டத்தின் மூலம், மாணவியர்	Cognitive Level
CO-1	இறைஆற்றலை உணர்ந்துகொள்ள உதவுகிறது	மதிப்பீடு
CO-2	நல்லநண்பர்களையும், நல்லமனிதர்களையும் இனம்கண்டுகொள்ள வழிவகுக்கிறது	நடைமுறைப்படுத்தல்
CO-3	அன்பு, இரக்கம், நற்சொல், நற்செயல் போன்ற நற்பண்புகளோடு வாழ்வழிவகுக்கிறது	மதிப்பீடு
CO-4	மனிதநேய பண்புகளோடு வாழ்ந்த சான்றோரின் அனுபவங்களைப் பெற்றுக்கொள்ள உதவுகிறது	நடைமுறைப்படுத்தல்
CO-5	மொழியை பிழையின்றி பேசவும் எழுதவும் உதவுகின்றது.	புரிதல், திறன் மேம்பாடு
CO-6	துனிமனித வாழ்க்கைச் சிக்கல்களையும் பிரச்சினைகளையும் எதிர்கொள்ளும் ஆற்றலை உருவாக்குகிறது	நடைமுறைப்படுத்தல், திறன் மேம்பாடு
CO-7	இறைவன்முன் அனைவரும் சமம் என்ற சிந்தனையை உருவாக்குகிறது	மதிப்பீடு
CO-8	போட்டித் தேர்வுகளுக்குப் பயன்படும் வகையில் படைப்பாக்கத் திறனை வளர்க்க உதவுகிறது	படைப்பாற்றல்

SEMESTER - II			
Part – I Tamil தாள் – II சமய இலக்கியங்களும் நீதி இலக்கியங்களும் செய்யுள், இலக்கணம், உரைநடை, வாழ்க்கை வரலாறு, இலக்கிய வரலாறு			
Code:18ULTA21	Hrs/Week: 6	Hrs / Semester: 90	Credits: 4

அலகு- 1 செய்யுள் - 2 மணி

- சைவம்**
1. தேவாரம் - சுந்தரர்
 2. திருவாசகம் - மாணிக்கவாசகர்
 3. திருமந்திரம் - திருமூலர்
- வைணவம்**
1. ஆண்டாள் - நாச்சியார் திருமொழி
 2. நம்மாழ்வார் - திருவாய்மொழி

பௌத்தம் : மணிமேகலை

கிறித்துவம் : கிறிஸ்து மொழிக்குறள்

இசுலாமியம் : பேட்டைஆம்பூர் அப்துல் காதிர் சாகிபு பாடல்

நீதி இலக்கியங்கள்

1. திருக்குறள்
2. நாலடியார்
3. பழமொழிநானூறு

அலகு-2 இலக்கணம் - 1 மணி

1. சொல்லின் பொது இலக்கணம்
2. பெயர்ச்சொல் - அறுவகை பெயர்கள்
3. வினைச்சொல் - வகைகள் - முற்று, எச்சம், ஏவல், வியங்கோள், செய்வினை, செயப்பாட்டுவினை, தன்வினை, பிறவினை
4. இடைச்சொல் - ஏகார ஓகார உம்மை இடைச்சொற்கள்
5. உரிச்சொல் - வகைகள்

அலகு- 3 உரைநடை - 1 மணி

எண்ணங்கள் - எம். எஸ். உதயமூர்த்தி

அலகு- 4 வாழ்க்கை வரலாறு - 1 மணி

அன்னைதேரேசா-பசுமைக்குமார்

அலகு-5 இலக்கியவரலாறு - 1 மணி

1. சைவ இலக்கியங்கள்
2. வைணவ இலக்கியங்கள்
3. கிறிஸ்துவம் தமிழுக்குச் செய்த தொண்டு
4. இஸ்லாமியம் தமிழுக்குச் செய்த தொண்டு

பதினெண் கீழ்க்கணக்கு நூல்கள் - அறநூல்கள் 11 மட்டும்

SEMESTER – III			
Part-I Tamil Paper - 3 காப்பிய இலக்கியங்களும் சிற்றிலக்கியங்களும்			
18ULTA31	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

Vision: மாணவியருக்கு தனது உரிமைகளைப் போராடி பெறுவதற்கும் நல்ல உறவுகளை இனம் கண்டு மதிக்கவும் கற்றுக்கொடுத்தல்.

Mission: காப்பிய மாந்தரின் வாழ்க்கையின் மூலமாக நம்பிக்கை, நல்ல உறவுகள், இயற்கையை நேசித்தல், மொழிஅறிவு போன்றவற்றை வளரச் செய்தல்.

Course Outcome:

CO.No.	இப்பாடத்திட்டம் மாணவியருக்கு	அறிவுசார் மதிப்பீடு
CO-1	பெண்கள் நீதிக்குப் போராடும் உணர்வை வளர்க்கிறது.	நடைமுறைப்படுத்தல்
CO-2	அரசியல் சூழ்ச்சி, இனம், சாதி குறித்த பாகுபாடு இவற்றிலிருந்து விடுதலை பெறும் வழிவகைகளைக் கற்றுக்கொடுக்கிறது.	நடைமுறைப்படுத்தல்
CO-3	இயற்கையைப் பேணுதற்கு உதவுகிறது.	நடைமுறைப்படுத்தல்
CO-4	சமயநல்லிணக்கம், இறைநம்பிக்கை இவற்றை உருவாக்குகிறது.	உருவாக்கம்
CO-5	மொழியைப் பிழையின்றி பேசவும் எழுதவும் உதவுகின்றது.	புரிந்துகொள்ளுதல், திறன் மேம்பாடு
CO-6	தனிமனித வாழ்க்கைச் சிக்கல்களை எதிர்கொள்ளும் நிலையை உருவாக்குகிறது	நடைமுறைப்படுத்தல்
CO-7	விவசாயிகளின் வாழ்க்கைப் பிரச்சினை, சமுதாயப்பிரச்சினை இவற்றை உணர்ந்து அவற்றை நீக்கும் திறனை உருவாக்குகிறது.	நடைமுறைப்படுத்தல், திறன் மேம்பாடு
CO-8	போட்டித் தேர்வுகளுக்குப் பயன்படும் வகையில் படைப்பாக்கத் திறனை வளர்க்க உதவுகிறது.	படைப்பாற்றல், திறன் மேம்பாடு

SEMESTER – III			
Part-I Tamil Paper - 3 காப்பிய இலக்கியங்களும் சிற்றிலக்கியங்களும்			
18ULTA31	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

அலகு - 1 செய்யுள் - 2 மணி
காப்பியங்கள்

1. சிலப்பதிகாரம் - வழக்குரைகாதை : 1 – 80 பாடலடிகள்
2. மணிமேகலை - பாத்திரம் பெற்ற காதை : 75– 145 பாடலடிகள்
3. சீவகசிந்தாமணி - கோவிந்தையார் இலம்பகம் - பாடல்கள்: 411, 421, 430, 437, 440, 441, 448, 454, 456, 474, 477, 483, 484, 488, 489.
4. கம்பராமாயணம் - நகரப் படலம் - பாடல்கள்: 94, 95, 98, 100, 103, 104, 108, 114, 116, 119, 129, 132, 138, 147, 153, 159, 160.
5. சீறாப்புராணம் - விடமீட்ட படலம் - பாடல்கள் : 1, 4, 5, 6, 7, 9, 12, 13, 15, 16, 17, 20, 23, 25, 27, 29, 32, 33, 34, 36, 37, 40, 42, 44.
6. இயேசுகாவியம் - மலைப்பொழிவு
7. பெரியபுராணம் - பூசலார் புராணம்

சிற்றிலக்கியங்கள்

1. முத்துக்குமாரசாமி பிள்ளைத்தமிழ் - செங்கீரைப் பருவம் - முதல் பத்து அடிகள்
2. முக்கூடற்பள்ளு - நகர்வளம் 19-வது பாடல்
3. நந்திக் கலம்பகம் - வெற்றிமுரசு சிறப்பு
4. திருக்குற்றாலக் குறவஞ்சி பாடல் - 9

அலகு - 2 இலக்கணம் - 1 மணி

பொருள் இலக்கணம்

1. அகப்பொருள் : எழுதிணை விளக்கம் - முதல், கரு, உரிப்பொருள்
2. புறப்பொருள் : வெட்சிதிணை முதல் பாடாண்திணை வரை விளக்கம் மட்டும்

யாப்பு இலக்கணம்

1. யாப்பு உறுப்புகள்

அலகு - 3 - உரைநடை - 1மணி

நீ போகும் பாதைகள் - கீழ்குளம் வில்லவன்

அலகு - 4 புதினம் - 1

பூர்வீக பூமி - சூர்யகாந்தன்

அலகு - 5 இலக்கிய வரலாறு - 1 மணி

1. ஐம்பெருங்காப்பியங்கள்
2. ஐஞ்சிறுகாப்பியங்கள்
3. சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும், பிள்ளைத்தமிழ், கலம்பகம், குறவஞ்சி, பரணி.

SEMESTER – IV			
Part-1 Tamil Paper – IV சங்க இலக்கியம்			
18ULTA41	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

Vision: மாணவியருக்கு நல்ல மதிப்பீடுகளைக் கற்பித்து, வாழ்வில் அவற்றைப் பின்பற்ற வழிவகுத்தல்.

Mission: இலக்கிய மாந்தரின் மூலம் நல்லவாழ்க்கை அனுபவங்களைப் பெறச்செய்து தன்னம்பிக்கை, ஆளுமைத் திறம், மொழி அறிவு இவற்றை உருவாக்குதல்.

Course Outcome:

CO.No.	இப்பாடத்திட்டம் மாணவியருக்கு	அறிவுசார் மதிப்பீடு
CO-1	அனுபவ அறிவை வளர்க்கிறது.	நடைமுறைப்படுத்தல்
CO-2	பழந்தமிழர் வாழ்வியல் முறைகளை கற்று பயனடைய உதவுகிறது.	நடைமுறைப்படுத்தல்
CO-3	ஆய்வு நோக்கினை வளர்க்கவும் வாழ்வின் வளர்ச்சி நிலையை மேம்படுத்திக் கொள்ளவும் உதவுகிறது.	நடைமுறைப்படுத்தல், உருவாக்கம்
CO-4	மனிதநேயம், இறை நம்பிக்கை இவற்றை உருவாக்குகிறது.	உருவாக்கம்
CO-5	மொழியைப் பிழையின்றி பேசவும் எழுதவும் உதவுகின்றது.	திறன் மேம்பாடு
CO-6	தனிமனித வாழ்க்கைச் சிக்கல்களை எதிர்கொள்ளும் நிலையை உருவாக்குகிறது	நடைமுறைப்படுத்தல், உருவாக்கம்
CO-7	சமுதாய பிரச்சினைகளை எதிர்கொள்ளும் திறம் கிடைக்கிறது.	நடைமுறைப்படுத்தல், திறன் மேம்பாடு
CO-8	போட்டித் தேர்வுகளுக்குப் பயன்படும் வகையில் படைப்பாக்கத் திறனை வளர்க்க உதவுகிறது.	படைப்பாற்றல், திறன் மேம்பாடு

SEMESTER – IV			
Part-1 Tamil Paper – IV சங்க இலக்கியம்			
18ULTA41	Hrs / Week:6	Hrs / Semester: 90	Credits: 4

அலகு - 1 செய்யுள் - 2 மணி

எட்டுத்தொகை

1. நற்றிணை - பாடல்கள் : 1, 12
2. குறுந்தொகை - பாடல்கள் : 23, 58, 135
3. ஐங்குறுநூறு - மஞ்சைப்பத்து - பாடல்கள் : 294, 296, 297, 299
4. பதிற்றுப்பத்து - பாடல் : 28
5. கலித்தொகை - பாடல் : 27
6. அகநானூறு - பாடல்கள் : 173, 270
7. புறநானூறு - பாடல்கள் : 279, 312

பத்துப்பாட்டு

நெடுநல்வாடை - 80 வரிகள்

அலகு - 2 இலக்கணம் - 1 மணி

1. பாவகைகள் - வெண்பா, ஆசிரியப்பா பொது இலக்கணம்
2. அணி இலக்கணம் - உவமை, உருவகம், வேற்றுமை, வஞ்சப்புக்கழ்ச்சி, சிலேடை, தற்குறிப்பேற்றம்
3. வாக்கிய வகைகள்
4. பிறமொழிச் சொற்களை நீக்கி எழுதுதல்
 - அ. ஆங்கிலச் சொற்கள்
 - ஆ. வடமொழிச் சொற்கள்
 - இ. தெலுங்குச் சொற்கள்

அலகு - 3 உரைநடை - 1மணி

சிந்தனைக் களஞ்சியம் - தமிழ்த்துறை - கட்டுரைத் தொகுப்பு,
தூய மரியன்னை கல்லூரி (தன்னாட்சி), தூத்துக்குடி

அலகு - 4 நாடகம் - 1 மணி

தண்ணீர் தண்ணீர் - கோமல் சுவாமிநாதன்

அலகு - 5 இலக்கிய வரலாறு - 1 மணி

1. எட்டுத்தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்
3. சங்க இலக்கியத்தின் தனிச்சிறப்புகள்

Preamble

Acquisition of a foreign language and exposure to a different culture enhances the quality of a person. An understanding of a different civilisation opens vistas in the perception of the learner. Learning a new language is an additional skill and it widens the employability scope of the students, considering the large number of international collaborations in the global market.

Vision:

To impart knowledge and skill in French to enhance employment opportunities of the students

Mission :

To promote an understanding and appreciation of the French language and literature

Part-I Course in French is set to equip the students with an additional qualification, of acquisition of a foreign language, French. Two-year course in French creates

- Ability to act and respond in specific life-time situations of communication
- Ability to understand and translate sentences into target language
- Capability to compare and evaluate the life style of the French in contrast with Indians
- Capability to create a text of her own, narrating her day to day life
- Capability to summarize a poem or a dialogue in her own words
- Capability to use the knowledge and skill in diverse professions such as translator, interpreter , editor etc in multinational companies

Criteria of eligibility

Part-I French course is offered to students who have studied French in schools and also to students who have no knowledge of French, beginners.

I B.A., / B.Sc Part I FRENCH

SEMESTER – I			
PART – I French Paper – I Preliminary French Course			
Code : 18ULFA11	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Vision :

To initiate a beginner to the francophonic world and to train them to make their maiden efforts in spoken and written French

Mission:

To create a number of real life situations to make the learner express herself in the target language through experiential teaching method

Course Outcomes :

CO	At end of this Course, the students will be able to	CL
1.	To identify French monuments and celebrities	Kn,Ap
2.	To understand the living style of the French	Un
3.	To know and understand the taste and leisure time activities of the French people	Kn, Un
4.	From the perspective of communication	
5.	To describe a lodging	Cr
6.	To redact an advertisement	Cr
7.	To express her desires and preferences	Cr
8.	To create a blog and to express herself	Cr
9.	To redact a portrait of a personality	Cr

Prescribed Text Book:

Cocton Marie-Noëlle,Heu Elodie, Houssa Catherine, Kasazian Emilie,

Dupleix Dorothée et Ripaud Delphine, *Saison 1* Les Editions Didier,Paris,2015.

Unite I : Mes cinq sens en action

Unite II : S'ouvrir aux autres

Unite III : Partager son lieu de vie

Unite IV : Vivre au quotidien

Unite V : Fêtes et Traditions

Books, Journals and Learning Resources

:

- le cahier d'activités(CD Audio INCLUS)
- Le manuel numérique premium classe
- Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices » par Evelyne Sirejols, Tempesta Giovanna
- Les applis complémentaires
- 450 nouveaux exercices(niveau débutant)par Grand-Clément Odile Clé International, 2003.
- Les 500 exercices de grammaire par Akyuz Anne,Bazelle-Shahmaei Bernadette,Bonenfant Joelle, Gliemann Marie-Francoise,Hachette livre,2005
- Grammaire Progressive du français par Grégoire Maia, Clé International,2002.
- Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices » par Sirejols Evelyne , Tempesta Giovanna
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- www.facebook.com/SaisonFLE

I B.A., / B.Sc Part I FRENCH

SEMESTER – II			
Paper – II Basic French Course			
Code : 18ULFA21	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

VISION : To develop and improve upon the acquisition of four competencies of language learning

MISSION : To motivate and to enthuse the learner's mind to life-long learning experience evidenced through various situations of communication

Course Outcomes:

CO	At end of this Course, the students will be able to	CL
1.	To understand the cultural practices of the French	Kn, Un
2.	To know and understand cultural life at Louisiane	Kn, Un
3.	To know the dressing style of the French	Kn
4.	To know the eating habits of the French	Kn, Un
5.	To be exposed to city life and various modes of transport	Kn, Un
6.	To describe a city	Kn, Un
7.	To compare cities	An,
8.	To redact an invitation	Cr
9.	To create a recipe of her own	Ap, Cr
10.	To describe an outfit	Ap, Cr
11.	To narrate an outing	Ap, Cr

Prescribed Text Book: Cocton Marie-Noëlle, Heu Elodie, Houssa Catherine, Kasazian Emilie, Duplex Dorothée et Ripaud Delphine, *Saison*, Les Editions Didier, Paris, 2015.

Unite I : S'ouvrir à la culture

Unite II : La langue française en partage

Unite II I : Gouter a la campagne

Unite IV : La gastronomie française, une question de gout

Unité V : Voyager dans sa ville, La Belgique, carrefour de l'Europe

Books, Journals and Learning Resources

1. le cahier d'activités(CD Audio INCLUS)
2. Le manuel numérique premium classe
3. Les applis complémentaires
4. Grand-Clément Odile,*450 nouveaux exercices(niveau débutant)* Clé International, 2003.
5. Akyuz Anne,Bazelle-Shahmaei Bernadette, Bonenfant Joelle, Gliemann Marie-Francoise, *Les 500 exercices de grammaire* ,Hachette livre,2005
6. Grégoire Maia ,*Grammaire Progressive du français* , Clé International,2002.
7. Sirejols Evelyne , Tempesta Giovanna,*Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices*

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I B.Com., / BBA / B.Sc (Computer Science) Part I FRENCH

SEMESTER – I			
Paper Title-Basic French and Commercial terms			
Code : 18ULFB11	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Vision :

To impart knowledge of the culture of the French and to give training in speaking and writing French to a beginner

Mission :

To provide ample opportunities to induce and ignite the independent learning capacity.

CO	At end of this Course, the students will be able to	CL
1.	To adopt French as the language of the class	Kn, Un
2.	To enrol herself on a social media network	Ap, Cr
3.	To orient herself in a city	Un, Ap
4.	To adapt herself to new habits and rhythm of life	Un, Ap
5.	To invite and to respond to an invitation	Un, Cr, Ap
6.	To prepare a programme of outing	Un, Cr, Ap
7.	To translate the commercial terms from English to French & vice versa	Un, Ap
8.	To know and understand various aspects of cultural life of the French	Kn, Un

Prescribed Text Book:

Girardet Jacky, Pécheur Jacques, Gibbe Colette, Parizet Marie-Louise, *Tendances*, Clé International, 2016.

Prescribed Units:

Unite 1 : Commencer en français

Unite 2 : Arriver dans un pays francophone

Unite 3 : Découvrir une ville

Unite 4 : Vivre dans une famille, termes commerciaux

Unité 5 : Participer à une sortie

Books, journals and other references:

1. Evelyne Sirejols, Tempesta Giovanna *Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices »*
2. Girardet Jacky, Pécheur Jacques, *Cahier d'activités*, Clé International ,2016.
3. Grand-Clément Odile, *450 nouveaux exercices(niveau débutant)* Clé International, 2003
4. Akyuz Anne, Bazelle-Shahmaei Bernadette, Bonenfant Joelle, Gliemann Marie-Francoise, *Les 500 exercices de grammaire* Hachette livre, 2005
5. Grégoire Maia, Thievenez Odile, *Grammaire Progressive du français*, Clé International, 2002.

I B.Com., / BBA / B.Sc (Computer Science) Part I FRENCH

SEMESTER – II			
Paper Title-Essential French and Commercial correspondance			
Code : 18ULFB21	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Vision :

To build upon the language skills acquired to reach a standard level of speaking and writing French

Mission :

To give thrust on the actional approach to motivate the autonomy of the learner.

CO	At end of this Course, the students will be able to	CL
1.	To understand travel documents and to describe a displacement	Kn, Un
2.	To write a post card or mail about a voyage	Ap, Cr
3.	To know and understand the means of payment	Kn, Un
4.	To express her needs	Ap, Cr
5.	To create words of felicitation, thanks, excuse and to formulate a wish	Ap, Cr
6.	To know and understand the cultural life of the French	Kn, Un
7.	To describe an itinerary, to give instructions	Ap, Cr
8.	To redact commercial letters in French	Ap, Cr

Prescribed Text Book:

Girardet Jacky, Pécheur Jacques, Gibbe Colette, Parizet Marie-Louise, *Tendances*, Clé International, 2016.

Prescribed Units:

Unite 1 : Voyager

Unite 2 : Faire des achats

Unite 3 : Se faire des relations

Unite 4 : Organiser ses loisirs

Unite 5 : Se loger

Books for reference:

1. Girardet Jacky, Pécheur Jacques *Cahier d'activités* Clé International ,2016.
2. Grand-Clément Odile,*450 nouveaux exercices(niveau débutant)* Clé International, 2003.
3. Akyuz Anne,Bazelle-Shahmaei Bernadette,Bonenfant Joelle, Gliemann Marie-Francoise,
Les 500 exercices de grammaire Hachette livre,2005.
4. Grégoire Maia ,*Grammaire Progressive du français* Clé International,2002.
5. Sirejols Evelyne , Tempesta Giovanna *Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices »*

II B.A., / B.Sc Part I FRENCH

SEMESTER – III			
Paper – III Advanced French Course			
Code : 18ULFA31	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Vision : To enhance further the acquisition of four competencies of language learning

Mission : To create the independent capability of the learner to respond and tackle the various situations of communication when the learner is in the native country of the target language

Course Outcome:

CO	At end of this Course, the students will be able to	CL
CO-1	describe the souvenirs of the past	Ap, Cr
CO-2	create novel things with ancient objects	Cr
CO-3	attempt business ventures on the internet	Un, Ap
CO-4	understand the expatriate's experience	Un, Ap
CO-5	prepare for study in foreign countries	Ap, Cr
CO-6	speak of the weather	Ap, Cr
CO-7	speak about the system of education in France	Un,Ap
CO-8	become conscious of the environment	Ap, Cr

Prescribed Text Book: Cocton Marie-Noëlle, Heu Elodie, Houssa Catherine, Kasazian Emilie, Duplex Dorothée et Ripaud Delphine, *Saison*, Les Editions Didier, Paris, 2015.

Unite I : Faire du neuf avec du vieux-Faire revivre les objets-

Unite II : Exprimer l'accord ou le désaccord-Exprimer l'obligation et l'interdiction

Unite III : Changer d'air- Demander/donner son opinion-Parler du temps qu'il fait-

Unite IV : Découvrir-Apprendre-Réussir

Unite V : Devenir éco-citoyen-Ecrire une biographie-Institutions et femmes d'exception

Books, Journals and Learning Resources

1. le cahier d'activités(CD Audio INCLUS)
2. Le manuel numérique premium classe
3. Les applis complémentaires
4. Grand-Clément Odile, *450 nouveaux exercices(niveau débutant)* Clé International, 2003.

5. Akyuz Anne, Bazelle-Shahmaei Bernadette, Bonenfant Joelle, Gliemann Marie-Francoise, *Les 500 exercices de grammaire*, Hachette livre, 2005
6. Grégoire Maia, *Grammaire Progressive du français*, Clé International, 2002.
7. Sirejols Evelyne, Tempesta Giovanna, *Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices*
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II B.A., / B.Sc Part I FRENCH

SEMESTER – IV			
Paper – IV French Language through Literature			
Code : 18ULFA41	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Vision : To initiate the learner to the realm of French Literature

Mission : To create and develop the taste for literary readings in the target language

Course Outcome:

CO	At end of this Course, the students will be able to	CL
CO-1	comprehend the French literary background	Un, An
CO-2	imbibe the basic grammatical structures of the language	Un, An
CO-3	inculcate the values imparted through the literary texts	Un, An
CO-4	appreciate the simple literary texts	An, Ap
CO-5	acquire literary knowledge and enhance aesthetic perception	An, Ap
CO-6	explore a literary text, with the perspective of analysing the matter and manner of writing	An, Ap
CO-7	reflect upon the author's ideas and transform her own personality	Ap, Cr
CO-8	discover, interrogate and reflect on the humanistic value	Ap, Cr

II B.A., / B.Sc Part I FRENCH

SEMESTER – IV			
Paper – IV French Language through Literature			
Code : 18ULFA41	Hrs/week : 6	Hrs/Sem : 90	Credits : 4

Unité 1:

1. Au soir , auprès d'une chandelle -Pierre de Ronsard
- 2.Caractères -La Bruyère
- 3.La barbe bleue -Charles Perrault

Unité 2 :

- 1.La Jeune Tarentine -André Chénier
2. La Révolution Française
- 3.L'impératif

Unité 3 :

- 1.Le Pape est mort -Guy de Maupassant
- 2.A l'école des petits dieux -Bernard Wéber
- 3.Pronoms Relatifs

Unité 4 :

- 1.Oh voleur !quelle vie -Le Clezio
- 2.L'avalée des avalées - Ducharme
- 3.Pronoms Relatifs

Unité 5 :

- 1.L'homme qui plantait des arbres -Jean Giono
- 2.Pour toi mon amour -Jacques Prévert
- 3.Les indicateurs Temporels

Books for Reference :

- 1.Blondeau Nicole, Allouache Ferroud jà, Ne Marie-Françoise, *Littérature Progressive du Français*, Clé International,2004.
2. Akyuz Anne, Bazelle-Shahmaei Bernadette, Bonenfant Joelle, Gliemann Marie-Francoise, *Les 500 exercices de grammaire* ,Hachette livre,2005
- 3.Grégoire Maia ,*Grammaire Progressive du français* , Clé International,2002.
- 4.Sirejols Evelyne , Tempesta Giovanna,*Grammaire « Le Nouvel Entraînez-vous avec 450 Nouveaux Exercices*
- 5.Auge Helene, Marlhens Claire, Molinos Lluçia, *Grammaire et Communication*, Clé International,2008

At the end of two-year course, students will be able to

1. Develop their communicative skills in English for employment.
2. Employ their English proficiency to excel in cultural exchanges and to connect themselves globally.
3. Develop their comprehension and analytical skills in order to be innovative in all disciplines.
4. Build confidence and helps to maintain cordial relationship with colleagues in their flourishing career.
5. Express themselves as skilful English news readers and journalists.
6. Convert their passive vocabulary into active one; enhancing their speaking and writing skills.
7. Exercise their creativity in writing English.
8. Gain proficiency in writing skills and help them to write grammatically correct sentences.
9. Tune their soft skills which enable them to maintain good career records.
10. Improve their passion for reading literary works.

SEMESTER - I			
Part II English		Prose, Poetry, Extensive Reading and Language Study- I	
18UGEN11	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Vision:

To provide adequate exposure and opportunities for students to imbibe, develop, practice and use the LSRW skills with more opportunities to experiment and fine tune their productive skills – speaking and writing.

Mission:

To help students read and comprehend content in English

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	Cognitive Level
CO-1	Understand the written word in everyday life through the study of basic comprehension skills	Un
CO-2	Apply and incorporate basic grammar, mechanics, and sentence variety in writing.	Ap
CO-3	Label and paraphrase main ideas in readings.	Ap
CO-4	Develop their ability to read and spell words through an analysis of the structure of the English language.	Re
CO-5	Analyse the theme of prescribed texts of literature.	Un
CO-6	Evaluate the parts of speech.	Ev
CO-7	Listen and comprehend speech sounds.	Co
CO-8	Construct simple sentences and short paragraphs in response to reading.	Cr

SEMESTER - I			
Part II English		Prose, Poetry, Extensive Reading and Language Study-I	
18UGEN11	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Unit I - Poetry

Sarojini Naidu - Village Song

John Milton - On His Blindness

Robert Frost - The Road Not Taken

Unit II - Prose

Leigh Hunt - Getting Upon Cold Mornings

Robert Lynd - Sweets

Unit III - Short Story

Ernest Hemingway - A Day's Wait

Rabindranath Tagore - Kabuliwala

Unit IV – Grammar & Vocabulary

Parts of Speech, Tenses –Present, Past, Vocabulary of the Specific Domain, Punctuation, Kinds of Sentences

Unit V – Oral & Written Communication

Listening for handling simple situations, Listening Comprehension, Reading- passages from magazines & stories, Speaking – Introduction to body language, Basic interactions, Filling Forms, Developing Hints, Letters – leave letters, permission letters & personal letters

Text Books:

Units I – III – To be compiled by the Research Department of English

Units IV – V – CLIL (Content & Language Integrated Learning) – Module I by TANSICHE
(Tamil Nadu State Council for Higher Education)

SEMESTER – II			
Part II English		Prose, Poetry, Extensive Reading and Language Study- II	
18UGEN21	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Vision: To intensify English language teaching and learning to promote communication skills based on the strengths in specific domains of knowledge that students are already sound in.

Mission: To expose students to language skills through the core subjects.
To help students identify how writers use the creative resources of language-in poetry, nonfiction, and short fiction - to explore the entire range of human experience.

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	Cognitive Level
CO-1	Classify and develop the skills of interpretation, critical thinking, and clear writing.	An
CO-2	Demonstrate improved oral fluency.	Un
CO-3	Support future academic study by developing a high social, aesthetic and cultural literacy.	Cr
CO-4	Construct parts of a paragraph and essay, through prose writings.	An
CO-5	Build effective communication skills.	Un
CO-6	Make use of context clues and analyse poetic content and correlate to experiences.	An
CO-7	Use vocabulary through the study of word parts.	Ap
CO-8	Comprehend passages	Un

SEMESTER – II			
Part II English	Prose, Poetry, Extensive Reading and Language Study- II		
18UGEN21	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Unit I - Poetry

Nissim Ezekiel - The Night of the Scorpion

William Wordsworth- The Tables Turned

Walt Whitman - One's Self I Sing

Unit II - Prose

A.J. Cronin - Two Gentlemen of Verona

Robin Sharma -Your Commitment to Self- Mastery: Kaizen

Unit III - Short Story

Khushwant Singh - Karma

Oscar Wilde - The Happy Prince

Unit IV – Grammar & Vocabulary

Present & Past Continuous form, Command form, Will/Going to, Subject – Verb Agreement, Vocabulary of the Specific Domain, Paragraphing

Unit V – Oral & Written Communication

Listening for handling tough situations, Reading – passages from newspapers, incomplete stories, Pronunciation, Speaking (Storyline, Telephone Conversation), Key Functions

Text Books :

Units I – III – To be compiled by the Research Department of English

Units IV – V – CLIL (Content & Language Integrated Learning) – Module II by TANSICHE
(Tamil Nadu State Council for Higher Education)

SEMESTER – III			
Part II English	Prose, Poetry, Extensive Reading and Language Study- III		
18UGEN31	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Vision: To teach English based on the strengths in specific domains of knowledge that students are already sound in.

Mission: To expose students to language skills through the core subjects.
To help students explore the creative resources of language-in poetry, nonfiction, and one-act plays to enhance their vocabulary for interpersonal, academic, and real-life situations.

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	Cognitive Level
CO-1	Identify the common errors in their day today communication.	Ev
CO-2	Imbibe the language skills necessary for maintaining cordial relationship.	Ap
CO-3	Revise, organize and edit their assignments successfully.	Cr
CO-4	Enhance communicative competence in English.	Cr
CO-5	Construct sentences in different verb forms.	Ap
CO-6	Formulate specific questions and key ideas in class discussion.	Ap
CO-7	Appraise the specific values for life through the literary texts.	Ev
CO-8	Make use of grammar and vocabulary in practical ways.	Ap

SEMESTER – III			
Part II English	Prose, Poetry, Extensive Reading and Language Study- III		
18UGEN31	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Unit I – Poetry

Toru Dutt - Lotus

John Keats - La Belle Dame Sans Merci

Langston Hughes - The Weary Blues

Unit II – Prose

A.G. Gardiner - A Fellow Traveller

G.K. Chesterton - The Fallacy of Success

Unit III - One Act Play

Cedric Mount - The Never Never Nest

Percival Wilde - The Hour of Truth

Unit IV – Grammar & Vocabulary

Present & Past Perfect form, Connectives & Linkers, Vocabulary of the Specific Domain, Paragraphing

Unit V – Oral & Written Communication

Evaluative Listening, Different Reading Strategies, Pronunciation, Public Speaking, Negotiation & Turn Taking, Tongue Twisters, Writing – Formal Letters, Emails, One Word Substitutes.

Text Books :

Units I – III – To be compiled by the Research Department of English

Units IV – V – CLIL (Content & Language Integrated Learning) – Module III by TANSICHE
(Tamil Nadu State Council for Higher Education)

SEMESTER – IV			
Part II English		Prose, Poetry, Extensive Reading and Language Study- IV	
18UGEN41	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Vision: To teach English based on the strengths in specific domains of knowledge that students are already sound in.

Mission: To expose students to language skills through the core subjects.

To help students explore the creative resources of language-in poetry, nonfiction, and Shakespearean plays and gain insight into the literary traditions and cultures of the brave new world.

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	Cognitive Level
CO-1	Interpret texts with an awareness of the specific cultural context.	A
CO-2	Improve their communication skills	U
CO-3	Compose and deliver engaging oral presentations.	A
CO-4	Adapt stylistic elements to aid and enhance communication.	Cr
CO-5	Modify their perspectives on the themes of perennial human interest.	Ev
CO-6	Adapt the vocabulary acquired through their reading and to use them in various situations in their everyday lives.	Cr
CO-7	Formulate appropriate writing style.	A
CO-8	Compose essays in a well-developed, academic voice.	Cr

SEMESTER – IV			
Part II English	Prose, Poetry, Extensive Reading and Language Study- IV		
18UGEN41	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Unit I – Poetry

Rabindranath Tagore - The Lord of My Life

Tennyson - Ulysses

Gabriel Okara - Once Upon a Time

Unit II - Prose

Juliane Koepcke - My First Plane Crash

Frank R. Stockton –The Lady or the Tiger

Unit III – Scenes from Shakespeare

A Midsummer Night’s Dream – Act II, Scene ii

Tempest – Act III, Scene i

Unit IV – Grammar & Vocabulary

Modals & Auxiliaries, Active & Passive Voice, Direct & Indirect Speech, Transformation of Sentences, Vocabulary of the Specific Domain, Homophones & Homonyms

Unit V – Oral & Written Communication

Extensive Reading/ Film (with subtitles) Viewing, Refuting, Arguing & Debating, Defending & Challenging Interviews (face to face, telephone & video conferencing), Making Presentations, Tongue Twisters

Text Books :

Units I – III – To be compiled by the Research Department of English

Units IV – V – CLIL (Content & Language Integrated Learning) – Module IV by TANSICHE
(Tamil Nadu State Council for Higher Education)

SEMESTER – I			
Core I		Classical Algebra	
Code :18UMAC11	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision

It provides a platform where students can develop algebraic problem solving strategies without the tediousness of pen and paper.

Mission

Transforming real life problems into equations and then solving them.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	solve polynomial equations and simultaneous linear equations.	4	An
CO-2	solve the equations using the relation between the roots and coefficients.	4	An
CO-3	form the equations from the given roots and identify and solve the reciprocal equations	5 , 9	Cr, Un
CO-4	transform the equations by increasing, decreasing and multiplying the roots of the equations	4	Un
CO-5	solve the equations by removing the terms of the equations.	4	Ap
CO-6	locate real and imaginary roots of the equations	5 ,9	Un
CO-7	find the approximate values of the irrational roots of the equations.	4	Cr
CO-8	<u>d</u> etermine the roots of the equations by using various methods like Cardon's method, Ferrari's method.	4	Cr

SEMESTER – I			
Part III Core I		Classical Algebra	
Code :18UMAC11	Hrs/week:5	Hrs/Semester:75	Credits:5

Unit I

Fundamental theorem of algebra - In an equation with real coefficients, imaginary roots occur in pairs - In an equation with rational coefficients, irrational roots occur in pairs - Relations between the roots and coefficients of equations. Symmetric function of the roots

Chapter - 6, Sec: 1 – 12 (Pages: 282-307)

Unit II

Sum of the powers of the roots of an equation - Newton's theorem on the sum of the powers of the roots - Transformation of equation - Reciprocal equation - Standard form of reciprocal equations - To increase or decrease the roots of a given equation by a given quantity – Form of the quotient and remainder when a polynomial is divided by a binomial

Chapter- 6, Sec: 13-18 (Pages: 308-334)

Unit III

Removal of terms – To form an equation whose roots are any power of the roots of a given equation - Transformation in General - Descartes' rule of signs - Rolle's theorem

Chapter-6, Sec: 19-25 (Pages: 334-358)

Unit IV

Multiple roots - Sturm's Theorem - Solutions of numerical equations – A rational fraction cannot be a root of an equation with integral coefficients, the coefficient of x^n being unity – Integral roots – Newton's method of divisors

Chapter-6, Sec: 26 – 29 (Pages: 358-376)

Unit V

Horner's method.- General solution of the cubic equations - Cardon's method – Trigonometrical method – Solution of biquadratic equation - Solution of cubic equations - Ferrari method.

Chapter-6, Sec: 30,34 (Pages:376-382,390-398).

Text Book

1. Manicavachagom Pillay T.K., Natarajan T., Ganapathy K.S., Algebra, Volume-I, Ananda Book Depot, Chennai., Reprint 2017

Books for Reference

1. Arumugam S. and A. Thangapandi Isaac, Algebra, New Gamma Publishing House, August 2006.
2. Kandasamy P and K. Thilagavathi, Mathematics for B.Sc., 2004, Volume I and Volume IV, S. Chand & Co., New Delhi.

SEMESTER – I			
Core II		Calculus	
Code :18UMAC12	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision:

We will have high expectations of ourselves and of our students, be willing to take risks and to be challenged, work collaboratively and be patient in the learning process of calculus.

Mission:

To prepare the students for success in Calculus while helping them to develop an appreciation and proficiency with mathematical thinking which can be applied to real life situations.

Course Outcome :

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	state the concept of curvature of a plane curve.	5	Re
CO-2	calculate the curvature of various curves in plane and space	5 , 9	Ev
CO-3	apply the fundamental concepts of Calculus to variety of real world problems.	4	Ap
CO-4	find surface area using a double integral.	3 ,8	Un
CO-5	evaluate triple integrals and use them to find volumes in rectangular, cylindrical and spherical coordinates.	4 ,10	Ev
CO-6	compute definite and indefinite integrals of algebraic and trigonometric functions using formulae and substitution	10	Cr
CO-7	know the relationship between the Gamma and Beta functions	6 , 7	An
CO-8	use Beta and Gamma function to solve different type of integrals and to understand Gamma function as a generalization of factorial function.	7	Un, Ev

SEMESTER– I			
Part III	Core II	Calculus	
Code :18UMAC12	Hrs/week :5	Hrs/Semester :75	Credits :4

Unit I

Curvature and radius of curvature – Cartesian form-Centre of curvature

(Vol I,Chapter X, Sec 2.1 - 2.4, Pages : 291-309)

Unit II

Evolute and Involute-Pedal Equation -Asymptotes

(Vol I Chapter X, Sec 2.5 - 2.8, Pages : 309-

317,Exercises 45: 1-11, Chapter XI, Pages 324-341)

Unit III

Singular Points(Node,cusp,conjugate points)and Tracing of curves (Cartesian only)

(Vol I, Chapter XII, Chapter XIII, Pages : 342-372)

Unit IV

Double and Triple Integrals - Changing the order of integration.Jacobians and Change of variables

(Vol II , Chapter V, Pages : 203-213,219-223,Chapter VI, Pages : 251-269)

Unit V

Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals, Improper Integrals.

(Vol II,Chapter VII, Pages : 278-300)

Text Book

1. S.NarayananandT.K.ManicavachagomPillay, Calculus Vol I and Vol II,S.Viswanathan (Printers & Publishers) PVT. LTD. (Edition-2015)

Books for Reference

1. Kandasamy P and K. Thilagavathi, Mathematics for B.Sc., Volume II – 2004, S. Chand & Co., New Delhi.
2. Apostaol T.M., Calculus, Vol. I (4th edition) John Wiley and Sons, Inc., Newyork 1991.
3. Apostaol T.M., Calculus, Vol. II (2nd edition) John Wiley and Sons, Inc., New York 1969)
4. Stewart,J, Single Variable Calculus (4th edition) Brooks / Cole, Cengage Learning 2010.

SEMESTER - I			
Allied Physics – Paper I			
18UPHA11	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3

Vision: To enable students to understand and appreciate the principle behind various physical phenomena and apply them in appropriate situations

Mission: To provide knowledge in the physical phenomena such as elasticity, bending of beams, surface tension, heat and light through the systematic study of theory and experiments

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	define fundamentals of elasticity and discuss concepts of stress and strain and the relationship between both, use the stress-strain equations to solve the problems of elastic modes	1	Re, Un
CO-2	solve problems related to uniform and non-uniform bending of beams	1	An
CO-3	define the terms viscosity and surface tension	1	Re
CO-4	describe the properties of fluids such as viscosity, surface tension and capillary rise and evaluate the value of coefficient of viscosity	1,2,6	Un,Ev
CO-5	estimate the thermal conductivity of a bad conductor	1	Ev
CO-6	calculate the specific heat capacity of a liquid	1, 6	An
CO-7	calculate the thickness of a thin wire by forming interference fringes	1, 2, 6	An
CO-8	assess the dispersive power and resolving power of a grating	1, 2, 6	Ev

SEMESTER - I			
Allied Physics – Paper I			
18UPHA11	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3

Unit I: Elasticity

Elastic moduli – Work done in shearing strain – Relation between elastic constants – Twisting couple on a cylindrical wire – Expression for couple per unit twist – Torsion pendulum – Experiment to determine the rigidity modulus of a wire using Torsion pendulum.

Unit II: Bending of beams

Bending of beams – Expression for bending moment – Theory of uniform bending – Expression for elevation in uniform bending – Experiment to find Young’s modulus using microscope – Non-uniform bending – Expression for depression – Experiment to find Young’s modulus using scale and telescope

Unit III: Surface tension & Viscosity

Surface tension – Excess of pressure over a curved surface – Coefficient of viscosity and its dimension – Experiment to determine the coefficient of viscosity of a highly viscous liquid (Stoke’s) – Rate of flow of liquid through a capillary tube by dimension method and by Poiseuille’s method – Experimental determination of surface tension: Drop-weight method – Analogy between current flow and liquid flow.

Unit IV: Thermal Physics

Mean free path – Expression for mean free path – Transport phenomena – Expression for viscosity, thermal conductivity and diffusion – Thermal conductivity – Lee’s disc experiment to determine the thermal conductivity of a bad conductor – Newton’s law of cooling – Determination of specific heat capacity of a liquid.

Unit V: Interference and diffraction

Young’s double slit experiment – Condition for interference – Additional phase difference due to dissimilar reflections – Colour of thin film – Air wedge – Thickness of a wire – Fresnel and Fraunhofer diffraction – Plane transmission grating – Experiment to find wavelength by normal incidence method – Distinction between interference and diffraction bands.

Text Books:

1. A. Ubald Raj and G. Jose Robin, Allied Physics vol. – I (Revised Syllabus), Indira publication, Marthandam, First edition 2006.
2. A. Ubald Raj and G. Jose Robin, Allied Physics vol. – II, Indira publication, Marthandam, First edition 2008.

Books for Reference:

1. Brijlal and Subramanian, A text book of Optics, S. Chand & Co.
2. D.S. Mathur, Elements of Properties of matter, ShyamLal charitable trust, New Delhi, Reprint 2013.
3. R. Murugesan, Properties of matter, Revised edition, S. Chand & Co. Ltd. 2008.
4. David Halliday & Robert Resnik & Jearl Walker, Fundamentals of Physics, John Wiley & sons Inc.

SEMESTER - I			
Ability Enhancement Course - Value Education			
Code : 18UAVE11	Hrs/Week : 2	Hrs / Semester: 30	Credits : 2

Unit I : Introduction

Value education and its Relevance to present day – Meaning of Value Education
 – Education and its role – Leading a fulfilling life of universal values

Unit II : Cultivation of Personal Values

Personal Values– Truth - Honesty and Integrity – Love –Compassion – Gratitude -
 Courage – Optimism – Friendship

Unit III : Elimination of Negative Emotions

Overcome fear – Jealousy is harmful – Sources of jealousy - Jealousy and
 compulsiveness- Be an optimist – Gossip is Dynamite – Anger

Unit IV : Family Values

Familial Responsibilities –Five Basic Functions of a Mother - Fathers’ role in the
 family - Five Duties of Children to Parents - Indian Cultural Values

Unit V : Spiritual Value

Cultivating Good Manners – Being Persuasive – Being authentic – Professional
 Ethics – Work Culture – Code of Conduct

SEMESTER – II			
Core III		Analytical Geometry of Three Dimensions	
Code:18UMAC21	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision:

- To study the properties of straight lines and curves in three-dimensional surfaces.
- To explore the implementation and far-reaching consequences of systems of measurement.

Mission:

This course deals with plane, straight line and sphere in rectangular Cartesian coordinates. This course is so developed as to help students visualize ideas, classify and identify different problem types in analytic geometry of three dimensions and select suitable problem solving techniques.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the fundamental aspects of three-dimensional geometry.	1,2 , 3	Un
CO-2	represent simple three-dimensional figures using two-dimensional drawings.	4	Un
CO-3	demonstrate basic mathematical understanding and computational skills in three dimensions.	5 , 9	Un
CO-4	apply algebraic methods to the study of curves and surfaces that lie in three dimensions.	5	Ap
CO-5	apply geometric properties and relationships to solve problems in three dimensions.	5	Un
CO-6	develop logical thinking, geometric thinking and three-dimensional spatial ability.	6 , 7	An
CO-7	solve many difficult problems with simple solutions.	6, 10	Cr
CO-8	create opportunities to use spatial skills in problem-solving tasks.	5, 9	Cr

SEMESTER – II			
Core III		Analytical Geometry of Three Dimensions	
Code:18UMAC21	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Unit I:

Direction cosines - direction ratios - angle between the lines – condition for perpendicularity and parallelism. **(Chapter 1, Pages: 1 – 23)**

Unit II:

Equation of planes - normal form - intercept form - angle between two planes **(Chapter 2, Pages: 24-45)**

Unit III:

Straight line- symmetrical form - plane and the straight line- angle between two planes - image of a point - image of line. **(Chapter 2, Pages: 46-61)**

Unit IV:

Skew lines - shortest distance between two lines - coplanar lines – volume of tetrahedron. **(Chapter 3, Pages: 61 - 91)**

Unit V:

Sphere - plane section of sphere - tangent line - intersection of two spheres - intersection of a plane with sphere. **(Chapter 4, Pages: 92 - 114)**

Text Book

1. Manicavasagom Pillay T.K. and Natarajan T., Analytical Geometry of 3D, S.Viswanathan (Printers & Publishers) Pvt.Ltd. Reprint 2017.

Books for Reference

1. Arumugam S. and Thangapandi Isaac A., Analytical Geometry of 3D and Vector Calculus, New Gamma Publishing House, January 2006.
2. Arup Mukherjee and Naba Kumar Bej., Analytical Geometry of Two and Three Dimensions, Books and Allied (P) Ltd., Kolkota, November 2010.

SEMESTER – II			
Core IV		Differential Equations	
Code:18UMAC22	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision

Exposing Differential Equations as a powerful tool in solving problems in physical and social sciences.

Mission

Furnishing the students with the tools necessary to solve ordinary differential equations and application problems modeled by them.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	identify an ordinary differential equation and its order.	4	Un
CO-2	verify whether a given function is a solution of a given ordinary differential equation (as well as verifying initial conditions when applicable).	5, 9	An
CO-3	classify ordinary differential equations into linear and nonlinear equations.	5, 9	Un
CO-4	solve first order linear differential equations.	4	An
CO-5	find the general solution of second order linear homogeneous equations with constant coefficients.	4	Cr
CO-6	compute the Laplace transform and inverse Laplace transform	4	Ap
CO-7	use the Laplace transform to compute solutions of second order, linear equations with constant coefficients	4	Ap
CO-8	identify essential characteristics of ordinary and partial differential equations.	4	Un

SEMESTER– II			
Part III	Core IV	Differential Equations	
Code :18UMAC22	Hrs/week :5	Hrs/Semester :75	Credits :5

Unit I

Linear equation with constant coefficients: Complementary function of a linear equation with constant coefficients-Particular Integral-Special methods for finding Particular Integral
(Chapter 5, Sec 1-4,pages :68-88)

Unit II

Linear equations with variable coefficients- Special method of evaluating the P.I when X is of the form x^m - Equations reducible to the linear equations-Linear equations of the second order - Complete solution given a known integral - Reduction to the normal form–Change of the independent variable– variation of parameters -Methods of operational factors.
(Chapter 5 Sec 5 and 6 pages : 89-102 &Chapter8Sec1-5, pages: 145- 160)

Unit III

Equations of the first order, but of higher degree - Solvable for p, x & y - Clairaut's form – Equations that do not contain x explicitly- Equations that do not contain y explicitly- Equations homogeneous in x and y.
(Chapter4 Sec1- 4 , pages : 60 – 67)

Unit IV

Laplace transform - Definition-Sufficient conditions for the existence of Laplace transform- Laplace transform of periodic functions-Some general theorems- the Inverse transforms.
(Chapter9 Sec1-6,pages: 161-199)

Unit V

Partial differential equation of first order – Classification of integrals - Derivation of partial differential equations - Lagrange's method of solving the linear equation – Special methods, Standard forms – Charpit's method .
(Chapter 12, Sec1-4, Sec5 (5.1-5.4), Sec 6pages : 219-238,240-247)

Text Book

S.Narayanan and T.K.ManickavachagamPillay, Differential Equations and its applications. Published by: Divya Subramanian for Aanda Book Depot ,Edition 2017

Books for Reference

1. A.R. Vasishtha and Dr.S.K.Sharma, Differential Equations, Krishna Educational Publishers,Seventeenth Edition : 2015
2. A.R. Vasishtha and Dr.S.K.Sharma, Partial Differential Equations, Krishna Educational Publishers,Seventeenth Edition : 2015
3. Dr.S.Arumugam and A.ThangapandiIssac, Differential Equations and Applications, New Gamma Publishing House, Edition 2011

SEMESTER – II			
Allied Physics – Paper II			
18UPHA21	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3

Vision: To enable students to understand the importance of Physics in the development of latest technology and apply them in appropriate situations

Mission: To offer knowledge in the physical phenomena such as electrostatics, electromagnetism, relativity, electronics and energy physics through the systematic study of theory and experiments

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	apply the Gauss law in the calculation of electric fields due to various charge distributions and Understand coulomb's law which gives an idea about the electrostatic force between point charges.	1	Ap, Un
CO-2	define and explain self and mutual inductance	1	Re, Un
CO-3	employ Lenz law and Faraday's law for magnetically coupled circuits	1	An
CO-4	apply knowledge of electricity and magnetism to explain the nature of physical process and related technological advances	1	Ap
CO-5	understand the principle of energy release in nuclear reactions and identify the present energy scenario and the need for energy conservation	8	Un
CO-6	examine the structure of various number system and its application in digital design	6, 8	Un, An
CO-7	analyse the environmental aspects of renewable energy sources	5	An
CO-8	acquire the knowledge of solar cells, photovoltaic cells, wind energy and solar energy principles and applications	5	Un

SEMESTER – II			
Allied Physics – Paper II			
18UPHA21	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3

Unit I: Electrostatics

Coulomb's law – Electric field and field intensity – Electric field due to point charge – Electric dipole – Electric flux – Gauss law – Applications – Electric field due to a charged conducting sphere (point inside and point outside) – Uniformly charged cylinder (line charge) – Electric potential – Potential difference – Relation connecting electric field and electric potential at a point – Equipotential surface .

Unit II: Electromagnetism

Faraday's laws of induction – Induced current and charge – Self induction – Self inductance of toroidal solenoid – Determination of self inductance using Rayleigh method – Mutual inductance – Coefficient of coupling – Determination of mutual inductance using B.G.

Unit III: Nuclear Physics

Nuclear Reactions – Energy balance in nuclear reactions and Q-value – Threshold energy of an endoergic reaction – Nuclear fission – Energy released in fission – Chain reaction – Atom bomb – Nuclear reactors – Uses of nuclear reactors – Nuclear fusion – Sources of stellar energy – Thermonuclear reactions – Hydrogen bomb – Controlled thermonuclear reactions.

Unit IV: Digital electronics

Binary numbers – Conversion of decimal number into binary number – Binary to decimal – Binary addition – Multiplication – Subtraction by 2's complement – Basic logic gates – OR, AND, NOT (Implementation only for basic gates), NOR, NAND gates – De Morgan's laws – Boolean equations and logic circuit from truth table – NOR and NAND gates as universal building blocks – Binary adder – Half adder.

Unit V: Energy Physics

World's reserve of commercial energy source and their availability – Various forms of energy – Conventional and Non-conventional energy sources – Solar energy – Photo voltaic effect – Photo voltaic cells – Conversion of solar energy into electricity – Solar cells – Solar heaters – Wind energy – Power of wind – Wind mill – Wind farms – Energy crisis and possible solutions – Global warming.

Text Books:

1. A. Ubald Raj and G. Jose Robin, Allied Physics, Indira Publication, Marthandam, First edition 2008.
2. A. Ubald Raj, Electromagnetism and Plasma Physics, Indira Publication, Marthandam, Revised edition 1998.
3. R. Murugesan, Er. KiruthigaSivaprasath, Modern Physics, S. Chand & Co. Pvt. Ltd., New Delhi, Reprint 2014.

4. S.L.Kakani, K.C. Bhandari, Electronics Theory and Applications, New Age International Publishers, New Delhi, Reprint 2014.
5. G. D. Rai, Non-conventional energy sources, Khanna Publishers, 11th reprint 2014.

Books for Reference:

1. Brijlal N. Subramanian, Electricity & Magnetism, Published by RatanPrakashanMandir, 14th revised edition, 1985.
2. G. Jose Robin and A. Ubald Raj, Energy Physics, Indira Publications, Marthandam, Revised edition: December 2014.
3. R. Murugesan, Electricity and Magnetism, S. Chand and Company Ltd., 7th Revised edition 2018.

SEMESTER – I & II			
Allied Physics - Practical			
18UPHAR1	Hrs / Week: 2	Hrs / Semester: 30	Credits: 2

List of Experiments (Any twelve)

1. Young's modulus – Uniform bending – Pin and microscope
2. Young's modulus – Non-uniform bending – Scale and telescope
3. Rigidity modulus – Torsion pendulum
4. Specific heat capacity of liquid – Newton's law of cooling
5. Spectrometer – Grating – Normal incidence
6. Spectrometer – Refractive index of the prism
7. Air wedge – Thickness of a wire
8. Basic logic gates – OR, AND and NOT
9. Thermal conductivity of a bad conductor – Lee's disc
10. Determination of surface tension – Drop weight method
11. Coefficient of viscosity – Burette method
12. Co-efficient of viscosity – Stoke's method
13. Demorgan's law verification
14. Boolean expression verification
15. Half adder

Semester – II			
Environmental Studies			
Code : 18UAEV21	Hrs/ Week : 2	Hrs/Sem:30	Credits : 2

Course Outcomes:

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

- 1 Recognize the biotic and abiotic components of ecosystem and how they function
- 2 Use natural resources more efficiently and know more sustainable ways of living
3. Acquire an attitude of concern for the environment
4. Participate in improvement and protection of environment
5. Manage unpredictable disasters
- 6 Create awareness about environmental issues to the public

Unit I Environment and Ecosystem

Aim and need for Environmental Awareness - Components of Environment Ecosystem
 - Components of Ecosystem: Abiotic and biotic factors (Producer, Consumer and Decomposer) – Food Chain, Tropic Levels - Food Web, Energy flow and Ecological pyramids

Unit II Natural Resources:

Renewable and non-renewable resources – Water Resources: Uses and Conservation of Water – Rain Water Harvesting – Forest Resources: Importance of Forests - Major and Minor forest produces - Conservation of Forest Energy Resources: Solar Fossil Fuel – Wind – Role of individuals in the conservation of natural resources

Unit III Environmental Pollution

Pollutants – Types of pollution: Air, Water, Noise and Plastic Pollution – Causes, effects and Control measures – Solid Waste Management

Unit IV Human Population and Environment

Effect of human population on environment – Population Explosion problems related to population explosion – Involvement of population in conservation of environment – Measures adopted by the Government to control population growth – Environment and human health

Unit V Disaster Management

Floods–Drought–Earthquakes– Cyclones – Landslide–Tsunami–Control measures

Semester – III			
Part III	Core V	Sequences and Series, Trigonometry	
Code :18UMAC31	Hrs/week :6	Hrs/Semester :90	Credits :4

Vision

It gives an introductory knowledge of the basic abstract systems and fundamentals of Mathematics

Mission

To train the students to generalize the known concepts and to develop analytical thinking

Course Outcome

Co No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	develop the analytical thinking to generalize the known concepts.	3	Cr
CO-2	know the important inequalities necessary to compare the real numbers.	3	Ev
CO-3	explain the difference between a sequence and a series in the mathematical context.	2	Un
CO-4	able to identify boundedness, monotonic, limit points etc. of a sequence.	8	Un
CO-5	able to apply various tests to verify the convergence or divergence of a given sequence and also the series.	4	Ap
CO-6	gain a basic knowledge about analysis which helps them in higher studies.	3	Re
CO-7	apply the real situation wherever usage of trigonometrical equations	4	Ap
CO-8	reconstruct the formulae which are accustomed in elementary levels	8	Ev

Semester – III			
Part III	Core V	Sequences and Series, Trigonometry	
Code : 18UMAC31	Hrs/week :6	Hrs/ Semester :90	Credits :4

Unit I

Sequences - Bounded Sequences - Monotonic Sequences - Convergent Sequences - Divergent and oscillating sequences - The algebra of limits- Behaviour of monotonic sequences

(Chapter 3 Sec 3.1 – 3.7, pages 39 - 68)

Unit II

Some theorems on limits – Subsequences - Limit points - Cauchy sequences - Cauchy’s general principle of convergence of sequences

(Chapter 3 Sec 3.8 – 3.11, pages 69 - 103)

Unit III

Series of Positive Terms - Infinite series - Comparison test - Kummer’s test - D’Alembert’s ratio test - Raabe’s test - Gauss’s test - Cauchy’s Root test – Cauchy’s condensation test(without proof)

(Chapter 4 Sec 4.1 - 4.4, pages 112 - 150)

Unit IV

Alternating series – Leibnitz’s test - Absolute convergence - Tests for convergence of series of arbitrary terms – Dirichlet’s test – Abel’s test - Multiplication of series - Abel’s theorem – Merten’s theorem

(Chapter 5 Sec 5.1 - 5.3 &5.5, pages: 157 – 172, 182 - 188)

Unit V

Hyperbolic functions - Logarithm of a complex number - Gregory’s Series - Summation of trigonometric series using $C+iS$ method(only)

(Chapter 7, pages: 20 – 43, 58-60)

Text Book

Dr. Arumugam.S & Thangapandi Issac.A, Sequences and Series and Trigonometry, New Gamma Publishing House, Palayamkottai (June 2014).

Books for Reference

1. Joseph A. Mangaladoss, Sequences and Series and Trigonometry, Sarup and Sons, First Edition, 2005
2. J.A. Green, Sequences and Series, Routledge & Kegan Paul Ltd, 1958

Semester – III			
Part III Allied III		Statistics I	
Code :18UMMA31	Hrs/week :3	Hrs/ Semester:45	Credits : 3

Vision

The students knows different types of moments and the shape of the curves

Mission

The students understand different statistical concepts which are useful for the economic growth of the country and for the industrial development

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the difference between the central moments and general moments	1	Un
CO-2	compute the central moments and general moments	3	Ev
CO-3	analyse the time reversal test	8	Cr, Ap
CO-4	convert fixed base index to chain base index	3	Ap
CO-5	classify the different index numbers	8	Un, Ap
CO-6	find correlation between two variables	3	Ap
CO-7	evaluate particular regression lines	3, 7	Ap
CO-8	know the uses of index numbers	4	Cr

Semester – III			
Part III Allied III		Statistics I	
Code :18UMMA31	Hrs/week :3	Hrs/ Semester:45	Credits : 3

Unit I

Introduction - Moments - Skewness and Kurtosis

(Text Book 1: Chapter 4, Sec 4.1- 4.2, pages: 82-94)

Unit II

Curve fitting: Principles of Least Squares -Fitting a straight line-Fitting a second degree parabola.

(Text Book 1: Chapter 5, Sec 5.1, pages: 95-105)

Unit III

Correlation - Rank correlation.

(Text Book 1: Chapter 6, Sec. 6.1- 6.2, pages: 106-129)

Unit IV

Regression.

(Text Book 1: Chapter 6, Sec. 6.3, pages: 129-144)

Unit V

Introduction - Uses of Index numbers - Methods of constructing index numbers - Tests of adequacy of index number formulae - The chain index numbers.

(Text Book 2: chapter 13, Pages: 536-568)

Text Books

1. S. Arumugam and A. Thangapandi Issac, Statistics, New Gamma Publishing House, Palayamkottai, 2011.
2. S.P.Gupta, Statistical Methods, Sultan Chand & Sons, Educational Publishers, New Delhi, Forty Third Revised Edition, 2014,

Books for Reference

1. H.C.Saxena, Elementary Statistics, S.Chand & Company Ltd., New Delhi, Tenth Edition, 2011.
2. J.N.Kapur and Saxena, Mathematical Statistics, S.Chand & Company Pvt Ltd., New Delhi, First Edition, 1960.

Semester –III			
Part III	Allied IV	Linear Programming	
Code : 18UMMA32	Hrs/week : 3	Hrs/ Semester:45	Credits : 3

Vision

Discuss Linear Programming as a mathematical technique to model decision and optimization problems relevant in engineering, various industries and other applications, as well as methods for solving the resulting models and interpret the solutions.

Mission

To apply appropriate methods for the efficient computation of optimal solution of a problem which is modeled by a linear objective function and a set of linear constraints.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	develop a fundamental understanding of linear programming models	1, 3	Un
CO-2	develop a linear programming model from problem description	5	An
CO-3	formulate a simplified description of a suitable real-world problem as a linear programming model in general, standard and canonical forms	8	Cr
CO-4	solve a two-dimensional linear programming problem graphically.	8	Ap
CO-5	convert a linear programming problem into standard form.	8	Un
CO-6	apply the simplex method for solving linear programming problem.	5	Ap
CO-7	express the dual of a linear programming problem and solve the resulting dual problem using the dual simplex method	8	Cr,Ap
CO-8	model , analyze or solve a practical real-world problem using the theory and methods learned in this course	4, 5	Ap,An

Semester –III			
Part III	Allied IV	Linear Programming	
Code : 18UMMA32	Hrs/week : 3	Hrs/ Semester :45	Credits : 3

Unit I

Introduction - Mathematical formulation of the problem - Graphical Solution method - General linear programming problem - Canonical and standard forms of L.P.P. (Chapter 2, Sec 2.1, 2.2, 2.3 & 2.4 , pages 39-64 ,Chapter 3, Sec 3.1, 3.2, 3.4 & 3.5, pages 65 - 76 & 79 – 86).

Unit II

Simplex Algorithm – Introduction, Fundamental Properties of Solutions(Theorems-Statement only)-The Computational Procedure

(Chapter 4, Sec 4.1& 4.3, pages 87- 89 & 99 -106).

Unit III

Use of Artificial Variables - The big M method (Charnes Penalty Method) - Two phase simplex method (Chapter 4, Sec 4.4, pages 106 – 114).

Unit IV

Duality – Introduction – General Primal Dual pair – Formulating a Dual Problem - Dual and Simplex method

(Chapter 5, Sec 5.1, 5.2, 5.3, 5.4 ,5.7 & 5.9, pages 129 – 134 & 138 – 142).

Unit V

Duality - Dual and Simplex method.

(Chapter 5, Sec 5.9, pages 148 – 150)

Text Book

1. Gupta P.K., Kantiswarup and Manmohan, Operations Research, Sultan Chand & Sons, Educational publishers, New Delhi -2, Reprint 2011.

Books for Reference

1. Prem Kumar Gupta and Hira D.S., Operations Research, Sultan Chand & Sons, Educational publishers, New Delhi -2
2. Billy E Gillet, Introduction to Operations Research, Tata McGraw Hill publishing Company, New Delhi.

Semester – III			
Women’s Synergy			
Code : 18UAWS31	Hrs/ Week : 2	Hrs/Sem:30	Credits : 2

Course Outcome

- To know about Women’s health issues including menstruation, pregnancy, child birth etc, thereby taking care of themselves.
- Create awareness about their own biases, fears and comfort levels and encourage to dream and fuel their own growth and self development.
- Engage in promoting social justice and women rights
- Create platforms and facilitate the young women to operate symbiotically towards issues affecting their lives and take self initiatives for growth.
- Identify historic and contemporary women of importance as well as crucial moments in Women’s history

Unit I - Physical Health

Woman’s Structural Organisation – Levels of organisation – Body image - Reproductive health – Hormonal Cycle and its Psycho-somatic implications – Child birth – lactation – Nutritional status of women.

Unit II – Psychological Health

Examining factors determining psychological conditions of women – Depression, anxiety, stress, hysteria – Socio – cultural and familial conditioning of women’s minds – Self Image, Discrimination against women.

Unit III – Women and Legal Awareness

Women specific – centered legislations – legal issues – laws to prevent gender based violence National / State Pro-women schemes – educational and Employment schemes. Laws for protection of Women – Women’s rights to property – Women’s Rights in the Indian Constitution – Maternity benefit act.

Unit IV – Women and Finance

Manager of domestic finance – Budgeting basics – Create a family budget - Set financial goals – Plan for financial emergencies – Budget for travel – Saving strategies – Investment options

Unit V – Women’s Empowerment in Various Domain

Introduction - Women created history in sports and music – P. T. Usha, M. S. Subbulakshmi - Women who crossed hurdles in Social Service – Mother Theresa, Muthulakshmi Reddy, Medha Patkar - Role of Women in Indian independence movement and Politics – Indira Gandhi, Aruna Asaf Ali.

Books for Reference:

1. Devi K. Uma. *Women's Equality in India: a Myth or Reality*. New Delhi: Discovery Publishing House, 2000. Print.
2. Forbes, Geraldine. *The New Cambridge History of India: Women in Modern India*. Cambridge: Cambridge University Press, 2007. Print
3. Gonsalves, Lina. *Women and Human Rights*. New Delhi: APH Publishing House, 2011. Print
4. Jeyaraj, Nirmala. (Ed.). *Women and Society*. Delhi, Madurai: ISPCK & Lady Doak College, 2005. Print.
5. Tripathi, Prof. Madhusoodan. *Women Rights in India*. New Delhi: Omega Publications, 2011. Print.

Semester – III			
Part III Core Skill Based Numerical Aptitude and Arithmetic Ability			
Code :18UMAS31	Hrs/week : 4	Hrs/ Semester : 60	Credits :4

Vision:

To bring out the mental ability and skill of the students

Mission:

To train the students for competitive and professional examinations

Course outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	acquire the ability to understand and analyze the problem	2	Un
CO-2	develop their calculating and computing skills.	5	Ap
CO-3	solve mathematical problems using shortcut methods.	4	Cr
CO-4	build confidence to face the competitive examinations.	5	Cr
CO-5	solve the questions with accuracy and within the given time limit.	3	Cr
CO-6	enhance logical skills, arithmetic skills and aptitude skills.	5	Ap
CO-7	simplify and evaluate algebraic expressions.	3	Ev
CO-8	use mathematical concepts in real world situations.	4, 8	Ap

Semester – III			
Part III Core Skill Based Numerical Aptitude and Arithmetic Ability			
Code :18UMAS31	Hrs/week :4	Hrs/ Semester :60	Credits :4

Unit I

Percentage– Time and Work – Time and Distance

(Chapters 10,15,17, pages 179-218, 309-330, 343-360)

Unit II

True discount and Banker’s discount – Ratio and Proportion

(Chapters 26, 27, 12, Pages 485-489, 490-493, 248-276)

Unit III

Average – Chain rule - Calendar – Trains – Boats and Streams

(Chapters 6,14,18,19, Pages 123-142, 291-308, 361-370)

Unit IV

Simplification – profit and loss

(Chapters 4,11, Pages 68-95, 219-247).

Unit V

Line Graphs-Pie charts - Bar Diagrams

(Chapters 33,34,35, Pages 525-536, 537-542, 543-549)

Text Book

1. Aggarwal R.S., Arithmetic Subjective and Objective for Competitive Examinations, S.Chand and Company Ltd. , Ram Nagar, New Delhi - 55. Revised Edition 2014

Books for Reference

1. Aggarwal R.S., Quantitative Aptitude , S.Chand and Company Ltd. , Ram Nagar, New Delhi.
2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Tata McGraw-Hill Publishing Company Ltd., New Delhi.

Semester III	
Self Study Course	Foundation of Mathematics
Code: 18UMASS1	Credits: +2

Vision

To equip the students with a foundation for lifelong learning, critical thinking and collaborative, technical problem solving in professional and business context.

Mission

To inspire the students to learn foundation of mathematics and creative approaches to addressing mathematical problem and make them to become competent users of mathematics and mathematical application.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	gain enriched understanding of concepts of mathematical sets, theory of sets, equivalent sets and cardinal number.	1	Un
CO-2	describe and explain the concepts of axiomatic method and euclidean geometry.	3	Un
CO-3	obtain a basic outline of a paradoxes in set theory, cantor's paradox and russell's paradox.	1	Un
CO-4	differentiate advantages and disadvantages of the axiomatic method and genetic method.	3	An
CO-5	discuss the method of truth table and the predicate calculus.	3	Cr
CO-6	understand and analyze the concepts of axiomatic method and the completeness of an axiom system.	6	Un
CO-7	construct geometry according to euclid, euclid's postulates and non-euclidean geometry	8	Cr
CO-8	analyze the notion of axiomatic method and formal axiomatic method.	2	An

Semester III	
Self Study Course	Foundation of Mathematics
Code: 18UMASS1	Credits: 2

Unit I

The Axiomatic method – Geometry according to Euclid – Euclid’s postulates – Non Euclidean Geometry. **(Chapter: 1, pages: 1 - 6)**

Unit II

The formal axiomatic method - Description of formal axiomatic method –Analysis of axiomatic method – Consistency of axiomatic method - Completeness of an axiom system – Advantages and Disadvantages of the axiomatic method **(Chapter: 1, pages:6 - 18)**

Unit III

The Genetic method - The theory of sets – Equivalent sets – Cardinal numbers **(Chapter: 1, pages: 18 - 25)**

Unit IV

Paradoxes in set theory –Cantor’s Paradox – Russell’s Paradox – Axiomatic set theory – The three schools of thought. **(Chapter: 1, pages: 25 - 40)**

Unit V

Truth tables method – The Predicate Calculus **(Chapter: 1, pages: 40 - 44)**

Text Book

K.S. Narayanan and K. Narasimhan, A History of Mathematics ,Taj printers, First Edition Reprint 1985.

SEMESTER – IV			
Part III	Core VI	Real Analysis	
Code :18UMAC41	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Vision

To inculcate knowledge on Real numbers and their properties & proofs.

Mission

To develop the application of the concepts.

Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	interpret real number system and its properties.	1	Un
CO-2	define and recognize the continuity of real functions	1	Re
CO-3	define and recognize the real functions and its limits	1	Re
CO-4	interpret mathematical ideas via extended written presentation.	2	Un
CO-5	develop a broad understanding encompassing logical reasoning, generalization, abstraction, and formal proof.	5	An
CO-6	formulate proofs and structure mathematical arguments.	6	An
CO-5	determine the continuity, differentiability and integrability of functions defined on subsets of the real line	3	Ev
CO-7	apply the Mean Value Theorem and the Fundamental theorem of Calculus to problems in the context of real analysis	5	Ap
CO-8	describe fundamental properties of the real numbers that lead to the formal development of real analysis.	3	An

SEMESTER – IV			
Part III	Core VI	Real Analysis	
Code :18UMAC41	Hrs / Week: 6	Hrs / Semester: 90	Credits: 4

Unit I

Algebra of the Real Number System – Upper and Lower bounds – L.U.B property and its applications-Absolute value and Triangle inequality.

(Chapter 1, Sec 1.1- 1.4, pages 1-20).

Unit II

Continuous functions - $\varepsilon - \delta$ Definition of Continuity -Intermediate value theorem- Extreme value theorem - Monotone functions.

(Chapter 3, Sec 3.1- 3.5, pages 63-90).

Unit III

Limits - Uniform continuity - Differentiability of function - Mean value theorem - L'Hospital's Rules.

(Chapter 3, Sec 3.6 - 3.7, Chapter 4, Sec 4.1- 4.3, pages 90-103, 110 -134).

Unit IV

Higher order Derivatives - Taylor's Theorem - Darboux integrability - Properties of the integral - Fundamental theorem of Calculus.

(Chapter 4, Sec 4.4-4.5, Chapter 6, Sec 6.1-6.3, pages 134-144,175-199).

Unit V

Mean value theorem for integrals - Riemann's Original definition -Sum of an infinite series as an integral - Improper Riemann integrals.

(Chapter 6, Sec 6.4, 6.6, 6.7, 6.9, pages 199-203, 205-212, 214-219).

Text Book

1. Ajit Kumar and S.Kumaresan, Real Analysis, Crc Press, 2015.

Books for Reference

1. Richard R. Goldberg Methods of Real Analysis, Oxford & IBH Publishing Co, New Delhi. Reprint 1973.
2. Robert G. Bartle and Donald R. Sherbert Introduction to Real Analysis Fourth Edition Wiley India Edition, Reprint 2017.

Semester - IV			
Part III	Allied V	Statistics II	
Code : 18UMMA41	Hrs/week :3	Hrs/ Semester :45	Credits : 3

Vision:

Aims to create awareness about the uses of basic statistical concepts in their day-to-day life problems.

Mission

The students understand different distributions and their applications.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the difference between the discrete distribution and continuous distribution.	1, 2	Un
CO-2	calculate the mean, mode and median for different distributions.	7	Ap
CO-3	find approximate solutions to problems	4, 8	Cr, Un
CO-4	apply concepts and theorems in solving problems.	4	Ap
CO-5	demonstrate problem solving skills	3	An
CO-6	evaluate recurrence relation of p.d.f for various distribution.	3	An
CO-7	fit binomial, poisson and normal distribution.	8	Ap
CO-8	compare moment generating function and cumulant generating function	2, 7	Ev

Semester – IV			
Part III	Allied V	Statistics II	
Code :18UMMA41	Hrs/week : 3	Hrs/ Semester :45	Credits : 3

Unit I

Random variables - Discrete random variables - continuous random variables –Mathematical expectations.

(Text Book 1: Chapter12, Sec 12.1 - 12.4, pages: 304 -328)

Unit II

Moment generating function - Characteristic function.

(Text Book 1: Chapter12, Sec 12.5 - 12.6, pages: 331-342)

Unit III

Binomial distribution - Poisson distribution.

(Text Book 1: Chapter13, Sec 13.1 - 13.2, pages: 343 -369)

Unit IV

Normal distribution.

(Text Book 1: Chapter13, Sec 13.3, pages: 371 -389)

Unit V

Continuous probability distributions - Beta1, Beta2 & Gamma distributions,

(Text Book 2: Chapter 9, Sec 9.5 - 9.7, pages: 9.38 - 9.50)

Text Books

1. S. Arumugam and A. Thangapandi Issac; Statistics, New Gamma Publishing House, Palayamkottai, 2011.
2. S.C. Gupta and V.K. Kapoor; Fundamentals of Mathematical Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi, Eleventh edition, 2014.

Books for Reference

1. S.C. Gupta and V.K. Kapoor; Fundamentals of Mathematical Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi, Eleventh edition, 2014.
2. Sancheti D.C and Kapoor V.K; Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi, Eleventh edition, 2014.

Semester –IV			
Part III	Allied VI	Discrete Mathematics	
Code :18UMMA42	Hrs/week :3	Hrs/ Semester:45	Credits :3

Vision

To provide students with the basic knowledge, both theoretical and empirical, necessary to understand, analyze and solve discrete mathematical problems arising throughout their higher education and professional future.

Mission

To familiarize the students with the basic concepts, results, methods, vocabulary and notation associated with Discrete Mathematics.

Course Outcome

CO No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand logic and mathematical reasoning to count or enumerate objects in a systematic way.	1	Un
CO-2	use truth tables for expressions involving the logical connectives .	8	Ap
CO-3	develop capacity in knowing what constitutes a valid argument, and in constructing valid arguments or proofs.	3	An
CO-4	apply standard rules of inference.	3	Ap
CO-5	grasp the notions of lattices.	1	Un
CO-6	understand Boolean algebra and truth tables.	1	Un
CO-7	evaluate Boolean functions and simplify expressions using the properties of Boolean Algebra.	5	Ev
CO-8	apply logical reasoning to solve a variety of problems.	4	Ap

Semester – IV			
Part III	Allied VI	Discrete Mathematics	
Code :18UMMA42	Hrs/week :3	Hrs/ Semester :45	Credits :3

Unit I

Tautological Implications and Equivalence of Formulae – Replacement Process

(Chapter IX, Sec 8 - 9, pages 9.30 – 9.40).

Unit II

Functionally Complete sets of Connectives and Duality Law – Normal Forms - Principal Normal Forms

(Chapter IX, Sec 10 - 12, pages 9.40 – 9.56).

Unit III

Lattices – Hasse diagrams - Properties of Lattices – Duality Principle – Lattices through algebraic operations

(Chapter X, Sec 1- 2, pages 10.1– 10.12).

Unit IV

New Lattices – Lattice homomorphisms – Product lattice of two lattices - Modular and Distributive Lattices

(Chapter X, Sec 3 - 4, pages 10.13 – 10.34).

Unit V

Boolean Algebras – Boolean polynomials

(Chapter X, Sec 5 - 6, pages 10.34 – 10.50).

Text Book

1. Discrete Mathematics, M.K. Venkataraman, N. Sridharan and N. Chandrasekaran, The National Publishing Company, Chennai, 2009.

Books for Reference

1. J.P.Trembly, R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata Mc Graw Hill, NewDelhi, Reprint 2010.
2. Discrete Mathematics, Seymour Lipschutz, Marc Lars Lipson, Tata Mc Graw Hill, New Delhi.

SEMESTER- IV			
Ability Enhancement Course: Yoga and Meditation			
Code: 18UAYM41	Hrs/Week : 2	Hrs/Semester : 30	Credits: 2

Course Outcome:

- To learn and practice various meditation, yoga methods to transform the ordinary life into a healthy, harmonious life leading to holistic wellbeing,
- To create an eco-friendly, loving and compassionate world.
- Acquire knowledge and skill in yoga for youth empowerment.
- Increase their power of concentration
- Learn the causes and ways to overcome fear and sadness.
- Create a ecofriendly, loving and compassionate world

Unit I: Meditation

(6 Hrs)

Meditation – Purposes of meditation– Major types of meditations: Zazen, Mindfulness, Vipasana, Yoga, Self-inquiry, Listening, Qi Gong, Taoist, Tantra– Health benefits of meditation: physical, psychological, spiritual–Meditation and Silence:Silence of the body, mind, heart,and beyond – General methodology of meditation – Tips for better meditation

Exercises: Practicing Zazen meditation – Self-enquiry meditation exercises

Unit II: Self-Awareness

(6 Hrs)

Awareness – Self-awareness – Importance of self-awareness – Shades of self-awareness – Difference between Awareness and Concentration – Power of concentration – Levels of concentration – How to increase concentration? – Beauty of living here and now – Ways to develop your presence – Self-awareness and Ecology: interconnectedness

Exercises: Body Scan exercise – Self-Witnessing exercise – Eating Raisin with full awareness

Unit III: Yoga

(6 Hrs)

Meaning and importance of yoga – Yoga and human physical system – Principles of Yoga – Different types of yoga – Yoga and balanced diet – Yoga and energy balance – Pranayama – Surya namaskaram– Basic asanas for healthy life – Therapeutic benefits of simple yogasanas – Naturopathy for common ailments.

Exercises: Practicing basic Asanas – Doing Sun Salutation

Unit IV: Mindfulness

(6 Hrs)

Definition of mindfulness – Three components of mindfulness– Benefits of mindfulness – Mindfulness and Brainwave patterns – Myths about mindfulness – Scientific Facts about mindfulness – Formal method to practice mindfulness – Qualities of Mindfulness – Obstacles for mindfulness – informal ways of practicing mindfulness – Mindfulness to get rid of addictions

Exercises: Practice Mindful Walking –Practice Mindful Talking

Unit V: Heartfulness

(6 Hrs)

Attitude to life – Power of positive attitude – Techniques to develop positive attitude – Positive vs negative people – Forms of negative attitude – Heartfulness – Managing fear: Basic 5 fears, Ways to overcome fear–Handling anger: Anger styles, Tips to tame anger – Coping with sadness: Causes and ways to overcome sadness, dealing with depression – Ultimacy of compassion: Compassion to oneself, towards others: Forgiveness, to nature: Seeing God in all

Exercises: Practice Loving-Kindness meditation– Doing compassionate actions

Text Book:

- 1) Thamburaj Francis. *Meditation and Yoga for Holistic Wellbeing*. Trichy:Grace Publication. 2019.

Books References:

- 1) Osho. *Meditation the Only Way*. New Delhi: Full Circle Publication, 2009.
- 2) Thamburaj Francis. *Journey from Excellence to Godliness: Zen Meditation for Transformation*. Grace Publication, Trichy, 2017.
- 3) Osho. *Awareness: The Key to Living in Balance*. New York: St.Martin's Griffin Publication, 2001.
- 4) Tolle Eckart. *The Power of Now: A Guide to Spiritual enlightenment*. New World Library, 2004.
- 5) Swami Gnaneswarananda. *Yoga for Beginners*. Calcutta: Sri Ramakrishna Math, 2010.
- 6) HanhThichNhat. *The Miracle of Mindfulness: An Introduction to the Practice of Meditation*. Beacon Press, 2016.
- 7) Kamlesh D. Patel and Joshua Pollock. *The Heartfulness Way: Heart-Based Meditations for Spiritual Transformation*. Westland Publications, 2018.

Semester – IV			
Part III Core Skill Based Math Type using LaTeX			
Code :18UMAS41	Hrs/week :4	Hrs/ Semester:60	Credits :4

Vision

We give a deep knowledge of the LaTeX for Mathematical documentation

Mission

To train the students to use LaTeX skills in documenting and preparing for publications

Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	know the difference between MS Word and LaTeX	3	Un
CO-2	understand the uses of LaTeX	2	Un
CO-3	apply LaTeX in their typing work	1	Un
CO-4	handle math symbols and tables	3	An
CO-5	create documents and make small presentations.	3	Ap
CO-6	become proficient in the use of software applications as used in an office environment.	3, 8	Ap
CO-7	manipulate with the real life needs in preparing documents	3	Ap
CO-8	prepare projects in updating with the new updates and versions	8	Cr

Semester – IV			
Part III Core Skill Based Math Type using LaTeX			
Code :18UMAS41	Hrs/week :4	Hrs/ Semester :60	Credits :4

Unit I

Typing text : Words, sentences, and paragraphs - Symbols not on the keyboard - Comments and footnotes - Changing font characteristics - Lines, paragraphs, and pages – Spaces - Boxes

(Chapter 5, Sec 5.1 - 5.9, pages 61 - 115)

Unit II

Text environments: Some general rules for displayed text environments - List environments - Style and size environments -Proclamations (theorem-like structures) - Proof environments - Tabular environments - Tabbing environments - Miscellaneous displayed text environments

(Chapter 6, Sec 6.1 to 6.8, pages 117 - 149)

Unit III

Typing math: Math environments - Spacing rules - Equations - Basic constructs - Arithmetic operations - Delimiters - Operators - Math accents -Stretchable horizontal lines - Formula Gallery

(Chapter 7, Sec 7.1 to 7.9, pages 151 - 186)

Unit IV

More math: Spacing of symbols Building new symbols - Math alphabets and symbols - Vertical spacing - Tagging and grouping - Generalized fractions - Boxed formulas

(Chapter 8, Sec 8.1 to 8.6, pages 187 - 206)

Unit V

LaTeX documents: The structure of a document - The preamble - Abstract - Sectioning - Cross-referencing - Bibliographies.

(Chapter 10, Sec 10.1 to 10.6, pages 245 - 270)

Text Book:

1. George Gratzer, More Math into LaTeX, 4th Edition, Springer, 2007

Books for Reference:

1. Helmut Kopka and Patrick W. Daly, A guide to LaTeX, Fourth Edition, Addison-Wesley.
2. David R. Wilkins, Getting started with LaTeX, Second Edition.

Practicals:

Typing Text and Tables: Chapter 4.1 - Inserting Figures: Chapter 5.1 - Mathematical Equations: Chapter 6.3- Inserting References: Chapter 7.6 - Preparing an article for mathematical journal

Work Book: iSkills, LaTeX for beginners Workbook, 5th Edition, March 2014

Semester IV	
Self Study Course	Industrial Mathematics
Code: 18UMASS2	Credits:2

Vision

To understand and develop the linkage between mathematics and business.

Mission

To apply mathematics to engineering, science, society and industry and to emphasis on mathematical modeling, computational techniques and statistical reasoning.

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	evaluate range, quartile, mean deviation and standard deviation.	1	Ev
CO-2	apply basic operation to calculate frequencies.	3	Ap
CO-3	make connections of mathematical ideas to other ideas both inside of and outside of mathematics.	4	Ap
CO-4	demonstrate mathematical skills in the area of conditionally probability.	6	Un
CO-5	evaluate the consistency of data from a sample.	7	Ev
CO-6	demonstrate the knowledge of probability and the standard statistical distributions.	7	Un
CO-7	relate mean deviation and standard deviation.	3	Un
CO-8	measure the association between two binary variables with yule's coefficient.	5	Ev

Semester IV	
Self Study Course	Industrial Mathematics
Code: 18UMASS2	Credits: 2

Unit: I

Measures of dispersions: Measures of dispersions - Range - Quartile - Mean deviation - Standard deviation.

(Chapter: 3, Sec: 3.1, Pages: 60-80)

Unit: II

Theory of Attributes: Theory of Attributes – Positive class frequencies – negative class frequencies - Contrary frequencies.

(Chapter: 8, Sec: 8.1, Pages: 196 - 212)

Unit: III

Consistency of data: Consistency of data- Consistent- Inconsistent - Independence and association of data: Two attributes are independence.

(Chapter: 8, Sec: 8.2, 8.3, Pages: 212-228)

Unit: IV

Probability: Probability – random experiment – relative frequency – probability set function

(Chapter: 11, Sec: 11.1, Pages: 274-281& Exercise)

Unit: V

Probability: Conditional probability.

(Chapter: 11, Sec: 11.2, Pages: 281 - 303)

Text Book

1. Dr. S. Arumugam and Mr. A. Thangapandi Issac., Statistics, 2013, New Gamma Publishing House, Palayamkottai.

Semester –V			
Part III Core VII (Common Core) Computer Oriented Numerical Methods			
Code: 18UCCC51	Hrs/Week: 6	Hrs/ Semester : 90	Credits : 4

Vision:

To inspire the students with modern computational methods to carry out the problems.

Mission:

To equip students with the knowledge of algorithms of numerical analysis and execute it efficiently with MATLAB.

Course Outcome:

CO. No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	find numerical solution of a problem in all aspects and apply these methods to practical implementation as reliable and efficient.	3	Re
CO-2	recognize and apply appropriate principles and concept relevant to numerical analysis.	5	Ap
CO-3	discover the most appropriate estimate for the missing data.	1	Cr
CO-4	analyze the errors obtained in the numerical solutions of problems.	6	An
CO-5	use appropriate numerical methods, determine the solutions to given problems.	3	Ap
CO-6	demonstrate the use of the interpolation method to find the solution for the data.	8	Un
CO-7	develop their calculation skills.	1	Cr
CO-8	differentiate gauss jacobi iteration and gauss seidal iteration method.	3	An

Semester –V			
Part III Core VII (Common Core) Computer Oriented Numerical Methods			
Code: 18UCCC51	Hrs/Week: 6	Hrs/Semester: 90	Credits: 4

Unit I

Difference operators-Other difference operators-Newton's interpolation formula-Lagrange's interpolation formulae-Divided difference-Divided difference formula-Inverse interpolation.

(Textbook: 1, Chapter 3, Sec 3.1, 3.2, Chapter 4, Sec 4.1,4.3,4.4,4.5,4.6, pages 3.1 – 3.45, 4.1- 4.16, 4.31- 4.54) (Problems only)

Unit II

Derivatives using Newton's forward difference formula-Derivatives using Newton's backward difference formula-Derivatives using Newton's central difference formula-Maxima and minima of the interpolating Polynomial-Numerical Integration-Newton – Cote's quadrature formula-Trapezoidal Rule-Simpson's one third rule-Simpson's three eighth rule-Weddley's rule.

(Textbook: 1, Chapter 5, Sec 5.1 – 5.4, Chapter 6, Sec 6.1 – 6.4, pages 5.1 – 5. 24, 6.1 – 6.26) (Problems only)

Unit III

Taylor series method-Picard's method- Runge-Kutta method.

(Textbook: 1, Chapter 7, Sec 7.1,7.2,7.4, pages 7.1-7.15, 7.25-7.40) (Problems only)

Unit IV

Introduction to MATLAB: MATLAB environment – Types of files _ platform – search path – Constants, variables and expressions – Vectors and Matrices – Polynomials – Input Output statements – MATLAB Graphics.

(Textbook:2, Chapters:1,2,3,4,5,6)

Unit V

Control Structures- writing programs and functions – ordinary differential equation and symbolic mathematics – MATLAB Applications.

(Textbook: 2, Chapters: 7,8,9,10)

Text Books

- 1.Arumugam S and Thangapandi Isaac A, Numerical Analysis With Programming in C, New Gamma Publishing House, Palayamkottai.
- 2.Raj Kumar Bansal, Ashok Kumar Goel, Manoj Kumar Sharma, MATLAB and its Applications in engineering, Pearsons Publications.

Books for Reference

1. Stormy Attaway, MATLAB- A Practical Introduction to Programming and Problem Solving.
2. Stephen J. Chapman, Essentials of MATLAB Programming, Published November 1st 2007 by Thomson Learning.

Semester – V			
Part III	Core VIII	Modern Algebra	
Code :18UMAC52	Hrs/week :5	Hrs/Semester :75	Credits :4

Vision

To give an introductory knowledge of the basics abstract systems of mathematics

Mission

To train the students to generalize the known concepts and to develop analytical thinking.

Course Outcome

CO No	Upon completion of this course, students will	PSO addressed	CL
CO-1	explain the theory behind relations and functions and how functions may relate dissimilar structures to each other.	3	Cr
CO-2	describe and generate the basic algebraic structures such as Groups, Rings, Fields, Integral Domain, Euclidean Domain, etc., and will identify examples of these specific constructs.	1	Ev
CO-3	have a working knowledge of important mathematical concepts such as order of Group, order of an element, generator of a cyclic group, index of a subgroup, characteristic of a Ring, Maximal and Prime Ideals etc.,	2	Un
CO-4	analyze relationship between abstract algebraic structures with familiar number system such as integers, complex and real numbers	2	An
CO-5	critically analyze and construct mathematical arguments that relate to the study of introductory linear algebra. (Proof and Reasoning).	8	An
CO-6	develop ability to form and evaluate conjectures.	1, 5	Ap
CO-7	produce the group concepts in other science disciplinary	3	Ap
CO-8	illustrate the isomorphic structures	8	An

Semester – V			
Part III	Core VIII	Modern Algebra	
Code :18UMAC52	Hrs/week :5	Hrs/Semester :75	Credits :4

Unit I

Relations and Mappings - Relations - Equivalence Relations - Functions – Binary Operations

(Chapter 2, Sec 2.1 - 2.5, pages 2.1 – 2.18)

Unit II

Permutation groups - Sub groups - Cyclic Groups - Order of an Element - Cosets and Lagrange's theorem - Euler's theorem - Fermat's theorem

(Chapter 3, Sec 3.4 - 3.8, pages 3.12 – 3.31)

Unit III

Normal Subgroups and Quotient Groups - Isomorphism - Cayley's theorem - Homomorphism - Automorphism - Fundamental theorems of Homomorphism

(Chapter 3, Sec 3.9 - 3.11, pages 3.31 – 3.50)

Unit IV

Rings - definition and examples – Elementary properties of rings- Isomorphism – Types of rings - Characteristic of a ring - Sub rings

(Chapter 4, Sec 4.1 - 4.6, pages 4.1 – 4.18)

Unit V

Ideals - Quotient Rings - Maximal and PrimeI – Homomorphism of rings - Unique factorization domain(U.F.D.) – Euclidean domain.

(Chapter 4, Sec 4.7 - 4.10, 4.13- 4.14, pages 4.18 – 4.26, 4.31-4.36)

Text Book

1. Arumugam S. and Thangapandi Isaac A - Modern Algebra, Scitech Publications (India) PVT Ltd. Chennai Edition, 2003

Books for Reference

1. Bhattacharya P.B., Jain S.K., Nagpaul S.R., Basic Abstract Algebra, Second Edition, Cambridge University Press.
2. Santiago M.L., Modern Algebra, Arul Publications, Madras, 1988

Semester – V			
Part III	Core IX	Modern Analysis	
Code :18UMAC53	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision

To introduce the basic concepts in Analysis and to enable the students to understand fundamental ideas and theorems on Metric spaces

Mission

To develop the application of the concepts.

Course Outcome

CO No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	gain knowledge of concepts of modern analysis, such as open sets ,closed sets, completeness, connectedness and compactness in metric spaces	1	Un
CO-2	be able to write simple proofs on their own and study rigorous proofs	5	Ap
CO-3	develop a higher level of mathematical maturity combined with the ability to think analytically	2	Un
CO-4	develop a broad understanding encompassing logical reasoning, generalization, abstraction, and formal proof.	5	Ap
CO-5	formulate proofs and structure mathematical arguments.	6	Ap
CO-6	explain the basic theory of metric spaces and its application to function spaces.	3	Ev
CO-7	follow more advanced treatments of real analysis and study its applications	3	Ap
CO-8	apply the theory to solve mathematical problems including the construction of simple proofs.	2	An

SEMESTER – V			
Part III	Core IX	Modern Analysis	
Code :18UMAC53	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Unit I

Metric spaces - Bounded sets - open ball - open sets - diameter of a set - interior of set

(Chapter 2, Sec 2.1-2.6, pages 17-58)

Unit II

Closed sets - closure - limit point - dense sets

(Chapter 2, Sec 2.7-2.10, pages 59-79)

Unit III

Complete metric space - Cantor's intersection theorem - Baire's Category Theorem

(Chapter 3, Sec 3.1-3.2, pages 80-100)

Unit IV

Connectedness - equivalent conditions - connected subsets of \mathbb{R} - connectedness and continuity - continuous image of a connected set is connected - Intermediate mean value theorem

(Chapter 5, Sec 5.1-5.3, pages 139-150)

Unit V

Compactness - definition of open cover - compact metric space – Heine Borel theorem - compactness and continuity - continuous image of a compact set is compact - uniform continuity – Continuous function on a compact metric space is uniformly continuous – equivalent characterizations of compactness–compactness and continuity.

(Chapter 6, Sec: 6.1-6.4, pages: 150-178)

Text Book

1. Arumugam S. and Issac, Modern Analysis New Gamma Publishing House, Edition 2010.

Books for Reference

1. Richard R Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Co, New Delhi, Reprint 1973.
2. Robert G. Bartle and Donald R. Sherbert, Introduction to Real Analysis Fourth Edition Wiley India Edition, Reprint 2017.

Semester –V			
Part III	Core X	Operations Research	
Code :18UMAC54	Hrs/week : 4	Hrs/Semester :60	Credits : 4

Vision

To solve problems using appropriate techniques, interpret the results obtained and translate solutions into directives for action.

Mission

To familiarize the students with the basic concepts, models and statements of the operations research theory.

Course Outcome:

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	identify optimum solution.	1	Un
CO-2	interpret the mathematical tools that are needed to solve optimization problems.	2	Ap
CO-3	make decision and improve its quality.	3	Ev
CO-4	comprehend the concept of a Transportation Model and develop the initial solution for the same	4	Un
CO-5	apply the Hungarian method for solving assignment problems	5	Ap
CO-6	examine the significant impact of job sequencing system on total elapsed time management	8	An
CO-7	use CPM and PERT techniques, to plan, schedule, and control project activities.	4	Ap
CO-8	apply Mathematical theories to Commerce and Business and Management	3	Ap

Semester – V			
Part III	Core X	Operations Research	
Code :18UMAC54	Hrs/week : 4	Hrs/Semester :60	Credits : 4

Unit I

Transportation problem - Mathematical formulation - North West Corner Rule - Vogel's approximation method (Unit penalty method) - The method of matrix minima - optimality test - Maximization - u - v method.

(Chapter 10, Sec 10.1 10.2 10.8 – 10.13, pages 247, 248, 252 273)

Unit II

Assignment problem - Mathematical formulation - Method of solution - Maximization of the effective matrix

(Chapter 11, Sec 11.1, 1.2, 11.3 &11.4, pages 295 – 315)

Unit III

Sequencing problem - n - jobs and two machines - n - jobs and three machines, two jobs and m – machines

(Chapter 12, Sections 12.1, 12.2, 12.3 12.4 12.5 &12.6, pages 327 – 342)

Unit IV

Network Scheduling – Introduction - Basic Components – Logical Sequencing – Rules of Network Construction – Critical Path Analysis

(Chapter 25, Sec 25.1, 25.2, 25.3, 25.4 25.5,25.6 &12.6, pages 763 – 780)

Unit V

Probability Considerations in PERT - Probability of Meeting the Schedule Time.

(Chapter 25, Sec 25.7, pages 781 – 790)

Text Book

1.GuptaP.K., Kantiswarup and Manmohan, Operations Research, Sultan Chand & Sons, Educational Publishers, New Delhi -2, Reprint 2011.

Books for Reference

1.Prem Kumar Gupta and Hira D.S., Operations Research, Sultan Chand & Sons, Educational Publishers, New Delhi -2 .

2.Billy E Gillet, Introduction to Operations Research, Tata McGraw Hill publishing Company, New Delhi.

Semester –V			
Part III Core Integral I Vector Calculus and Fourier Series			
Code :18UMAI51	Hrs/week :4	Hrs/Semester :60	Credits :4

Vision

To introduce physical application of derivatives of vectors.

Mission

To help the students to study the line integral, surface integral and volume integral and their applications.

Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	differentiate and integrate vector-valued functions and apply calculus to motion problems in two and three dimensional space	2	An
CO-2	compute gradient, curl and divergence of vector fields.	1, 3	C
CO-3	use the gradient to find directional derivatives.	3	Ap
CO-4	solve problems in multiple integration using rectangular, cylindrical, and spherical coordinate systems	8	A
CO-5	select and apply appropriate models and techniques to define and evaluate integrals	3	E
CO-6	apply greens theorem, stokes theorem and gauss divergence theorem to evaluate integrals.	3	A
CO-7	know that any periodic function can be expressed as a fourier series.	6	Cr
CO-8	expand an odd or even function as a half-range cosine or sine fourier series.	1	Un, An

Semester –V			
Part III Core Integral I Vector Calculus and Fourier Series			
Code :18UMAI51	Hrs/week :4	Hrs/Semester :60	Credits :4

Unit I

Vector differentiation –Differentiation of vectors – Gradient

(Text Book 1: Chapter 5, Sec 5.0,5.1,5.2,5.3, Pages 5-1 to 5-18)

Unit II

Divergence and Curl – Solenoidal, Irrotational

(Text Book 1: Chapter 5, Sec 5.4, Pages 5-18 to 5-30)

Unit III

Vector integration - line integrals - surface integrals

(Text Book 1: Chapter 7, Sec 7.1, 7.2, Pages L&S INT 1 to 11)

Unit IV

Vector integration - Gauss, Stokes and Green's theorems (Without proof), problems only

(Text Book 1: Chapter 7, Sec 7.3, Pages L&S INT 11 to 32)

Unit V

Fourier series - Half - range, sine & cosine series

(Text Book 2: Part II Chapter 5, 459-478)

Text Books

1. Arumugam S. and Thangapandi Isaac A, Analytical Geometry of Three Dimensions and Vector Calculus, New Gamma Publishing House, Edition 2014,
2. Arumugam S. and Thangapandi Isaac A, Calculus, New Gamma Publishing House, Edition 2014.

Books for Reference

- 1.DuraiPandian P and Laxmi Duraipandian, Vector Analysis, Emerald Publishers, Edition 1986.
- 2.Piskunov N, Differential and Integral Calculus, Vol II, CBS Publishers and Distributors.

Semester – V			
Part III Core Integral II Statistical Inference			
Code :18UMAI52	Hrs/week :4	Hrs/Semester :60	Credits :4

Vision

It gives the knowledge of statistical quality control techniques and their applications

Mission

To apply the statistical techniques in their work stations

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the uses of statistical quality control.	1	Un
CO-2	compute the upper and lower control limits for different chart	3	Ev
CO-3	analyse the usage of different charts.	8	Cr, Ap
CO-4	know type I and type II error	1	Cr
CO-5	classify the different test static	5	Un, Ap
CO-6	check the difference between small and large samples.	1	Ap
CO-7	evaluate t-test, F-test etc	3, 7	Ap
CO-8	apply the correct test static	4	Ap

Semester – V			
Part III	Core Integral II	Statistical Inference	
Code :18UMAI52	Hrs/week :4	Hrs/Sem :60	Credits :4

Unit I

Statistical Quality Control - Definition, Advantages, Process control - Control chart, Mean chart, Range chart

(Text Book1: Vol.2, Chapter 7, Pages1051-1074)

Unit II

Control chart for standard Deviation, Control chart for C, Control chart for P ,np- chart

(Text Book1: Vol.2, Chapter 7, Pages 1082-1091)

Unit III

Testing of hypothesis - Null and Alternate Hypothesis. Type I and Type II errors - Critical region, level of significance - Test of significance for large samples - Testing a single proportion - Difference of proportions - testing a single mean - Difference of means.

(Text Book1: Vol.2, Chapter 3, Pages 882 – 908)

Unit IV

Tests based on t - distribution - Single mean - Difference of means - Tests based on F distribution - Variance ratio test - Test based on chi square distribution - Independence - Goodness of fit. (excluding the test for correlation)

(Text Book1: Chapter 3- 4, Pages 910 – 920, 954 – 970, 1006-1009)

Unit V

Analysis of Variance - One way and two way classified data - Basis of experimental design - simple problems.

(Text Book2: chapter 17 pages 481 – 506)

Text Books

- 1.Gupta S.P., Statistical Method , 44-th edition Sultan Chand & Sons Publishers-New Delhi.
- 2.Arumugam S. and Issac A., Statistics, New Gamma publishing House. Palayamkottai, 2016.

Books for Reference

1. Gupta S.C., Kapoor V.K., Fundamentals of mathematical Statistics , Eleventh edition, Sultan Chand & Sons, Educational Publishers, New Delhi
2. Sancheti D.C, Kapoor V.K., Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi

Semester V	
Self Study Course (Compulsory)	Astronomy
Code:18UMASS3	Credits:2

Vision

To enhance and share scientific understanding of the universe.

Mission

To introduce the exciting world of astronomy to the students and to help the students to study about the celestial objects.

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	use mathematics to perform calculations on earth or space science problems	4	Ap
CO-2	make observations regarding the earth or space and infer conclusion from them.	3	Ap
CO-3	describe and explain the motion of objects (sun, moon, planets, stars)	4	Un
CO-4	sketch and explain the relationships of objects in solar and lunar eclipse.	8	Cr
CO-5	discuss the contribution of lunar and solar calendar.	6	Cr
CO-6	discuss about stars, meteorites, comets and their masses.	5	Cr
CO-7	describe how stars evolve.	6	Un
CO-8	describe astronomical distance and size scales.	1	Un

Semester - V	
Self Study Course (Compulsory)	Astronomy
Code: 18UMASS3	Credits: 2

Unit I

Solar System - The Sun - Mercury - Venus - Mars

(Chapter: XVII, Sections: 328 - 331)

Unit II

Asteroids - Jupiter - Saturn - Uranus - Neptune - Pluto

(Chapter: XVII, Sections : 332 - 337)

Unit III

Comets – Meteors – Zodiacal Light

(Chapter: XVII, Sections: 338 - 340)

Unit IV

Stellar Universe –The Colour And Size Of Stars-Double And Multiple Stars - Variable Stars - Star Cluster – Milky Way

(Chapter: XVIII, Sections: 349 - 351, 353, 357)

Unit V

The calendar –Lunar and solar calenders - Egyptian calendar -Mayen Calender - Roman calendar – Julian calendar -Gregorian calendar – world calendar –Indian National calendar – Tamil and Malayalam Calenders.

(Chapter: XX, Sections: 362 - 370)

Text Book

1. S. Kumaravelu & Susheela Kumaravelu, Astronomy, 2011, A. Baskara Selvan printers, Sivakasi.

Semester –VI			
Part III	Core XI	Complex Analysis	
Code :18UMAC61	Hrs/week :6	Hrs/Semester :90	Credits :4

Vision

To expose students to more complex theories of study

Mission

To sharpen analytical thinking and their problem solving capacity

Course Outcome

CO. No	Upon successful completion of this course students will be able to	PSO addressed	CL
CO-1	compute sums, products, quotients, conjugate, modulus, and argument of complex numbers.	1	An
CO-2	understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.	2	Un
CO-3	evaluate integrals along a path in the complex plane and understand the statement of Cauchy's Theorem.	6	Ev
CO-4	know the condition(s) for a complex variable function to be analytic and/or harmonic.	3	Un
CO-5	compute the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues.	2	An
CO-6	use the Cauchy Residue theorem to evaluate integrals and sum series.	6	Ap
CO-7	demonstrate curve properties for image processing with transformation	6	Ap
CO-8	outline complex number system with intense perception	6	An

Semester –VI			
Part III	Core XI	Complex Analysis	
Code :18UMAC61	Hrs/week :6	Hrs/Semester :90	Credits :4

Unit I

Complex Numbers- Conjugation and modulus – Inequalities –Square Root – Geometrical Representation of Complex Numbers – nth Roots of Complex numbers - Circles and Straight lines – Regions in the Complex Plane - Extended Complex Plane - Continuous functions- Differentiability - The Cauchy - Riemann equations- Analytic Functions.

(Chapter 1 Sec 1.0 – 1.9, Chapter 2 Sec 2.4, 2.5, 2.6 & 2.7, pages 1- 21, 30 - 50)

Unit II

Harmonic functions - Conformal mapping – Elementary Transformations -Bilinear Transformations - Cross ratio –Fixed points of Bilinear Transformations – Some Special Bilinear Transformation.

(Chapter 2 Sec 2.8 - 2.9, Chapter 3, pages 50 - 100)

Unit III

Complex integration- Definite integral - Cauchy's theorem - Cauchy's integral formula - Higher derivatives

(Chapter 6, Sec 6.0 – 6.4, pages 132-172)

Unit IV

Series Expansions - Taylor's series - Laurent's series - Zeros of Analytic Functions – Singularities

(Chapter 7, Sec 7.0 – 7.4, pages 173 - 208)

Unit V

Calculus of Residues Residues - Cauchy's Residue Theorem - Evaluation of Definite Integrals

(Chapter 8, Sec 8.0 – 8.3, pages 209 -255)

Text Book

1. Arumugam S, Thangapandi Issac A, SomasundaramA.,Complex Analysis, SciTech publications(India) Pvt.Ltd, 2014

Books for Reference

1. Narayanan, ManicavachagomPillai, Complex Analysis, S.Viswanathan printers & Publishers Pvt. Ltd
2. P.Duraipandian, Laxmi Duraipandian & D.Muhilan, Complex Analysis, Emerald Publishers, Chennai

Semester –VI			
Part III	Core XII	Linear Algebra	
Code : 18UMAC62	Hrs/week : 6	Hrs/Semester : 90	Credits : 4

Vision

To extend the knowledge in Abstract Algebra and develop analytical thinking.

Mission

To equip the students with the ideas of Linear Algebra to pursue their higher studies.

Course Outcome :

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	know all the definitions in Linear Algebra	1	U
CO-2	analyze and construct mathematical arguments that relate to the study of linear algebra. (proof and reasoning).	2, 3	An
CO-3	solve systems of linear equations.	3	A
CO-4	work within vector spaces and to distill vector space properties	3	An
CO-5	determine whether a system of equations is consistent or not and find its general solution.	6	An
CO-6	compute eigenvalues and eigenvectors of a matrix.	4	A
CO-7	develop analytical thinking	5	An
CO-8	understand the concept of Inner Product Spaces	1	U

Semester –VI			
Part III	Core XII	Linear Algebra	
Code : 18UMAC62	Hrs/week : 6	Hrs/Semester : 90	Credits : 4

Unit I

Vector spaces - Elementary properties - subspaces - Quotient spaces - Direct sum - Linear span of a set - Linear dependence and independence

(Chapter 5, Sec 5.1, 5.2, 5.4, 5.5, Pages 5.1-5.10, 5.14-5.19)

Unit II

Linear transformations - vector space of linear transformations - Basis - Dimension, Any two bases of a finite dimensional vector space have the same number of elements – Theorems on dimension.

(Chapter 5, Sec 5.3, 5.6, Pages 5.10-5.13, 5.19-5.26)

Unit III

Rank and nullity theorem – Matrix of linear transformations – Algebra of matrices - Types of matrices – The inverse of a matrix.

(Chapter 5, Sec 5.7, 5.8, Chapter 7, Sec 7.1, 7.2, 7.3, Pages 5.26-5.30, 7.1-7.15)

Unit IV

Elementary transformations – Rank of a matrix - Characteristic equation of a matrix - Eigen values and eigen vectors - Cayley Hamilton theorem and problems – Solution of simultaneous equations using matrices.

(Chapter 7, Sec 7.4, 7.5, 7.6, 7.7, 7.8, Pages 7.15-7.40)

Unit V

Inner product spaces – Norm – Schwartz inequality – Triangular inequality - Gram Schmidt orthogonalisation process - orthogonal complement.

(Chapter 6, Pages 6.1-6.9)

Text Book

1. Arumugam .S and Thangapandi Issac.A , Modern Algebra , Scitech Publications (India) Pvt. Ltd., Chennai, Reprint 2017.

Books for Reference

1. Bhattacharya P.B., Jain S.K., Nagpaul S.R., Basic Abstract Algebra, Second Edition, Cambridge University Press.
2. Santiago M.L., Modern Algebra, Arul Publications, Madras, 1988

Semester VI			
Part III	Core XIII	Mechanics	
Code :18UMAC63	Hrs/week :6	Hrs/Semester :90	Credits :4

Vision

Getting knowledge to apply mechanical theory

Mission

Using the mechanical knowledge in their day-to -day life

Course Outcome

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the equilibrium of forces	1	Un
CO-2	know the conditions for equilibrium	3	Ev
CO-3	distinguish between parallel and non parallel forces	8	Cr, Ap
CO-4	know the types of friction laws	1	Cr
CO-5	apply friction laws in problems	5	Un, Ap
CO-6	understand the two types of impact	1	Ap
CO-7	understand the simple harmonic motion	3, 7	Ap
CO-8	determine the simple harmonic motion	4	Ap

Semester VI			
Part III	Core XIII	Mechanics	
Code :18UMAC63	Hrs/week :6	Hrs/Semester :90	Credits :4

Unit I

Lami's theorem, Parallel forces and moments - Resultant of Two like and unlike parallel forces, moment of a force - t Varignon's theorem - moment of force about an axis couples.

(Text Book 1: Chapter 3,4, pages 52-96)

Unit II

Equilibrium of three forces acting on rigid body subjected to any three forces - three coplanar forces theorem, Two Trigonometrical theorems, problems.

(Text Book 1: Chapter5, pages 98-142)

Unit III

Frictions - Laws of friction - angle of friction - cone of friction - Equilibrium of particle on a rough inclined plane under a Force.

(Text Book 1: Chapter7, pages 206-262)

Unit IV

Fundamental laws of impact - impact of a smooth sphere on a fixed smooth plane - direct impact of smooth elastic spheres.

(Text Book2: Chapter 8, pages 215-261)

Unit V

Definition - Geometrical representation of S.H.M.'s –Composition of S.H.M.'s of the same period and in the same line - Composition of S.H.M.'s of the same period and in two perpendicular directions.

(Text Book2: Chapter 10, pages 309-355)

Text Books

1. Venkatraman, M.K. Statics, Agasthiar Book House, Tiruchirapalli, Aug 2011
2. Venkatraman M.K, Dynamics, Agasthiar Book house, Tiruchirapalli, 16th Edition, Jan 2014

Books for Reference

1. Duraipandian P., Mechanics, S.Chand and Company Ltd
2. Bali N.P., Dynamics, Laxmi Publication, Delhi

Semester VI			
Part III	Core Integral III	Graph Theory	
Code :18UMAI61	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Vision

To learn basic concepts in graph theory.

Mission

To translate situations to diagrammatic representations and to develop problem solving skills.

Course Outcome

CO. No	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	interpret the basics of graphs.	1	Un
CO-2	identify induced subgraphs, paths, cycles, independent sets and coverings in graphs	1	Re
CO-3	determine whether graphs are Hamiltonian and/or Eulerian and to solve problems involving vertex and edge connectivity, planarity and crossing numbers	5	An
CO-4	combine theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph theory.	8	Un
CO-5	inspect the applications of graph theory	7	An
CO-6	model and solve real-world problems using graphs both quantitatively and qualitatively.	4	Ap
CO-7	develop an appropriate level of mathematical literacy and competency.	6	Cr
CO-8	formulate problems in terms of graphs, solve graph theoretic problems and apply algorithms.	5	Cr

Semester VI			
Part III	Core Integral III	Graph Theory	
Code :18UMAI61	Hrs / Week: 5	Hrs / Semester: 75	Credits: 4

Unit I

Graphs and sub graphs:

Introduction - Definition and examples - Degrees - Sub graphs –Isomorphism - independent sets and coverings - intersection graphs - Line graphs - Matrices - Operation on graphs

(Chapter 2, Sec 2.1-2.4, 2.6-2.9, pages 5-17, 19-27).

Unit II

Degree Sequences: Introduction –Degree sequences - Graphic Sequence **Connectedness** - introduction-walks - trails and paths - Connectedness and components - blocks - connectivity.

(Chapters 3 and 4 Sec 3.1-3.2, 4.1-4.4, pages 29-47).

Unit III

Eulerian and Hamiltonian graphs:

Introduction - Eulerian graphs - Hamiltonian graphs - Trees – introduction - Characterization of trees - Centre of a tree .

(Chapters 5 and 6, Sec 5.1-5.2, 6.1-6.2, pages 48-65).

Unit IV

Planarity:

Definition and properties, Characterization of planar graphs – thickness, crossing and outer planarity

(Chapter- 8, Sec 8.1-8.3, pages 73-84).

Unit V

Colourability:

Chromatic number and Chromatic index - the five colour theorem –Chromatic polynomials

(Chapter- 9, Sec 9.1-9.4, pages: 85-98).

Text Book

1. S. Arumugam , S. Ramachandran - Invitation to Graph theory, Scitech Publications (India) Pvt. Ltd., (2001) Chennai - 17.

Books for Reference

- 1.Parthasarathy K.R., Basic Graph Theory, Tata McGraw Hill Publishing Company Limited, New Delhi
- 2.John Clark and Derek Allan Holton A First Look at Graph Theory, World Scientific Publishing Co.Pte.Ltd, Singapore, Reprint 2013.

Semester VI			
Core Integral IV		Coding theory	
Code: 18UMAI62	Hrs / Week: 7	Hrs / Semester: 105	Credits: 4

Vision

To obtain the concept of source coding and various coding techniques that are used for practical purposes.

Mission

To generate mathematical ideas and methods that can be used to transmit information more reliably.

Course Outcome

CO. No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	understand the fundamental concepts of coding theory, types of error and control code technique.	1	Un
CO-2	perform with vectors, matrices and projective spaces over finite fields and polynomials.	4	Cr
CO-3	describe the concepts of extended golay code and decode the extended golay code.	3	Ev
CO-4	analyze the theoretical principles of source coding.	6	An
CO-5	analyze the notion of various decoding techniques.	3	An
CO-6	understand and analyze the concepts of error control coding.	2	Un, An
CO-7	prove general facts about different codes and block control coding.	6	Ev
CO-8	apply the knowledge of perfect codes, hamming codes, extended codes and golay codes for error detection and correction.	5	Ap

Semester VI			
Core Integral IV		Coding theory	
Code: 18UMAI62	Hrs / Week: 7	Hrs / Semester: 105	Credits: 4

Unit I

Basic assumptions – Correcting and detecting error patterns – Information rate – Effects of error correction and detection – Finding the most likely code word transmitted.

(Chapter 1, Sections: 1.1 - 1.6)

Unit II

Linear codes – Two important subspaces - Independence – Basis, Dimension – Matrices – Bases for C and C^+ – Generating matrices and Encoding.

(Chapter 2, Sections: 2.1 - 2.6)

Unit III

Parity check matrices – Equivalent codes – Distance of a linear code – Cosets – MLD for linear codes – Reliability of IMLD for linear codes.

(Chapter 2, Sections: 2.7 - 2.12)

Unit IV

Some bounds for codes – Perfect codes – Hamming codes – Extended codes – The Extended Golay code – Decoding the extended Golay code – The Golay code.

(Chapter 3, Sections: 3.1 - 3.7)

Unit V

Polynomials and Words – Introduction to cyclic codes – Polynomial Encoding and Decoding – Finding cyclic codes – Dual cyclic codes.

(Chapter 4, Sections: 4.1 - 4.5)

Text Book

1. D.G. Hoffman, D.A Leonard, C.C. Linder, K.T. Phelps, C.A. Rodger and J.R. Wall, Coding Theory - The Essentials, Marcel Dekker, Inc., 1991, New York.

Books for Reference

1. Ron M. Roth, Introduction to Coding Theory, 2006, Cambridge University Press, Cambridge, UK.
2. Raymond Hill, A first course in coding theory, 2004, Clarendon Press, Oxford.