SYLLABUS

B.Sc MATHEMATICS

பொதுத்தமிழ்

பி.ஏ., பி.எஸ்ஸி., பி.காம், பி.பி.ஏ.

(முதலாம் மற்றும் இரண்டாம் ஆண்டிற்கான நான்கு பருவங்களுக்கு)

பாடத்திட்டம்

2023 - 2024

தமிழ்நாடுமாநிலஉயர்கல்விமன்றம்
600 005

பொதுத்தமிழ்-1

தமிழ் இலக்கிய வரலாறு -1

முதலாம் ஆண்டு – முதற் பருவம்

Course Code	Course Name	category	L	T	P	S	Credits	Ins.Hrs	CIA	Externa	Total
	பொதுத்தமிழ் -1 தமிழ் இலக்கிய வரலாறு -1	Supportive	Y	-	-	-	3	6	25	75	100

Pre-Requisite	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்	SV 2023	

Learning Objectives

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ் மொழி இலக்கியங்களை அறிமுகம் செய்தல்
- தமிழ் இலக்கியப் போக்குகளையும், இலக்கணங்களையும் மாணவர் அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

Expected Course Outcomes

On the Sucessful completion of the Course, Students will be able to

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO 1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்	K4
CO 2	அற இலக்கியம் மற்றும் தமிழ் காப்பியங்களின்வழி வாழ்வியல் சிந்தனையைப் பெறுவர்	K5, K6
CO 3	பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினையும், பகுத்தறிவு இலக்கியங்களைக் கற்பதன் வழி நல்லிணக்கத்தையும் தெரிந்து பின்பற்றுவர்	K3
CO 4	மொழியறிவோடு சிந்தனைத்திறனைப் பெறுவர்	K3
CO 5	மொழிப்பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்.	K2

K1 - Remember; K2 - Undestand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

அலகு-1	தமிழ் இலக்கிய, இலக்கண வரலாறு அறிமுகம்.

1. இலக்கணம்;

அ.தொல்காப்பியம், இறையனார் களவியல் உரை , நம்பியகப் பொருள், புறப்பொருள் வெண்பா மாலை, நன்னூல், தண்டியலங்காரம், யாப்பருங்கலக்காரிகை- நூல்கள்

ஆ.மொழிப் பயிற்சி- ஒற்றுப்பிழை தவிர்த்தல்

- வல்லினம் மிகும் இடங்கள்
- வல்லினம் மிகா இடங்கள்
- ஈரொற்று வரும் இடங்கள்
- ஒரு, ஓர் வரும் இடங்கள்
- அது, அஃது வரும் இடங்கள்
- தான், தாம் வரும் இடங்கள்

பயிற்சி : வல்லினம் மிகும் இடங்கள், மிகா இடங்கள் தவறாக வரும்வகையில் ஒரு பத்தி கொடுத்து ஒற்றுப் பிழை திருத்தி எழுதச் செய்தல்.

2. சங்க இலக்கியம் - எட்டுத்தொகை, பத்துப்பாட்டு

3. அற இலக்கியம்-பதினெண்கீழ்கணக்கு நூல்கள்

4. காப்பிய இலக்கியம் - ஐம்பெருங் காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், சமயக் காப்பியங்கள்

5. பக்தி இலக்கியமும் (பன்னிரு திருமுறைகள், நாலாயிர திவ்வியப் பிரபந்தம் -- பகுத்தறிவு இலக்கியமும் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவண காவியம்)

அலகு-2	சங்க இலக்கியம்

எட்டுத்தொகை ;எ

1. நற்றிணை-முதல் பாடல் -நின்ற சொல்லர்

2. குறுந்தொகை 3 ஆம் பாடல் -நிலத்தினும் பெரிதே

3. ஐங்குறுநூறு –நெல் பல பொலிக! பொன் பெரிது சிறக்க!' (முதல் பாடல்)-வேட்கைப் பத்து

4. கலித்தொகை- 51 - சுடர்த்தொடீஇக் கேளாய் -குறிஞ்சிக் கலி

5. புறநானூறு -189 தெண்கடல் வளாகம் பொதுமையின்றி, நாடா கொன்றோ -187

பத்துப்பாட்டு;

1. முல்லைப்பாட்டு (முழுவதும்)

அலகு-3	அற இலக்கியம்

1.திருக்குறள் -அறன் வலியுறுத்தல் அதிகாரம்

2.நாலடியார்-பாடல்: 131 (குஞ்சியழகும்)

3.நான்மணிக்கடிகை-நிலத்துக்கு அணியென்ப

4.பழமொழி நானூறு- தம் நடை நோக்கார்

5.இனியவை நாற்பது- 37. இளமையை மூப்பு என்று

அலகு-4	காப்பிய இலக்கியம்

1. சிலப்பதிகாரம் – வழக்குரைகாதை

2. மணிமேகலை- பாத்திரம் பெற்ற காதை

3. பெரியபுராணம் - பூசலார் நாயனார்புராணம்

4. கம்பராமாயணம்- குகப் படலம்

5. சீறாப்புராணம் – மானுக்குப் பிணை நின்ற படலம்

6. இயேசு காவியம் -ஊதாரிப்பிள்ளை

அலகு-5	பக்தி இலக்கியமும், பகுத்தறிவு இலக்கியமும்

பக்தி இலக்கியம்;

1. திருநாவுக்கரசர் தேவாரம் - நாமார்க்கும் குடியல்லேம் எனத் தொடங்கும் பாடல் மட்டும்

2. மாணிக்கவாசகர் திருவாசகம் - நமச்சிவாய வாஅழ்க நாதன்தாள் வாழ்க முதல் சிரம்குவிவார் ஓங்குவிக்கும் சீரோன் கழல் வெல்க வரை

3. பொய்கையாழ்வார்-வையந் தகளியா வார்கடலே

4. பூதத்தாழ்வார்-அன்பே தகளியா

5. பேயாழ்வார்-திருக்கண்டேன் பொன்மேனி கண்டேன்

6. ஆண்டாள் – திருப்பாவை மார்கழித் திங்கள் (முதல் பாடல்)

பகுத்தறிவு இலக்கியம்;

• திருமூலர் – திருமந்திரம் (270,271, 274, 275 285)

• பட்டினத்தார் -திருவிடை மருதூர் (காடே திரிந்து – எனத் தொடங்கும் பாடல் பா.எண ;.279, 280)

• கடுவெளி சித்தர் - *பாபஞ்செய் யாதிரு மனமே* (பாடல் முழுவதும்)

• இராவண காவியம் – தாய்மொழிப் படலம் - 18.   ஏடுகை யில்லா ரில்லை *முதல்* - 22. செந்தமிழ் வளர்த்தார். வரை

Text books
•   .

Reference Books
• மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காதெமி, புதுடெல்லி.
• மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
• தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
• தமிழ் இலக்கிய வரலாறு –முனைவர்.சிற்பி பாலசுப்ரமணியம், முனைவர்.சொ.சேதுபதி
• புதிய தமிழ் இலக்கிய வரலாறு– முனைவர்.சிற்பி பாலசுப்ரமணியம்,நீல.பத்மநாபன்
• தமிழ் இலக்கிய வரலாறு - டாக்டர்.அ.கா.பெருமாள்
• தமிழ் இலக்கிய வரலாறு –முனைவர். ப.ச.ஏசுதாசன்
• தமிழ் இலக்கிய வரலாறு – ஸ்ரீ குமார்
• வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு–பாக்கியமேரி

| | தமிழ் பயிற்றும் முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம் |

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- https://www.chennailibrary.com/
- https://www.sirukathaigal.com
- https://www.tamilvirtualuniversity.org
- https://www.noolulagam.com
- https://www.katuraitamilblogspot.com

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
CLO1	3	2	3	3	3	2	2	2	3	2	3	2
CLO2	3	3	2	2	2	3	2	3	3	2	2	2
CLO3	3	2	3	3	2	2	2	3	2	3	3	2
CLO4		3	3	2	2	2	3	2	3	2	3	3
CLO5	3	3	2	2	2	3	3	2	2	2	3	3

Strong -3,Medium-2,Low-1

பொதுத்தமிழ் - 2

தமிழ் இலக்கிய வரலாறு -2

முதலாம் ஆண்டு – இரண்டாம் பருவம்

Course Code	Course Name	category	L	T	P	S	Credits	Ins.Hrs	CIA	External	Total
	பொதுத்தமிழ் -2 தமிழ் இலக்கிய வரலாறு -2	Supportive Y	-	-	-	3	6	25	75	100
Pre-Requisite		பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்					SV 2023				

Learning Objectives

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ் மொழி இலக்கியங்களை அறிமுகம் செய்தல்
- தமிழ் இலக்கியப் போக்குகளையும், இலக்கணங்களையும் மாணவர் அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

Expected Course Outcomes

On the Sucessful completion of the Course, Students will be able to

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO 1	சிற்றிலக்கியங்களின்வழி இலக்கியச் சுவையினையும் பண்பாட்டு அறிவினையும் பெறுவர்	K4
CO 2	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்	K5, K6
CO 3	திராவிட இயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழி உணர்வு , இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனைகளைப் பெறுவர்	K3
CO 4	தமிழ்மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கவும் அறிந்து கொள்வர்	K3
CO 5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தினைப் பயன்கொள்ளும் வகையில் பயிற்சி பெறுவர்.	K2

K1 - Remember; K2 - Undestand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

அலகு-1	தமிழ் இலக்கிய வரலாறு அறிமுகம்.

1. சிற்றிலக்கியம்; குறவஞ்சி, கலம்பகம், உலா, பரணி, பள்ளு, பிள்ளைத்தமிழ், தூது, அந்தாதி.
2. தனிப்பாடல் அறிமுகம்
3. இக்கால இலக்கியம் ;கவிதை, சிறுகதை,நாடகம், உரைநடை. , திராவிட இயக்கம் வளர்த்த தமிழ்.

அலகு-2	சிற்றிலக்கியக்கழும்,தனிப்பாடலும்

சிற்றிலக்கியம்;

- கலிங்கத்து பரணி- விருந்தினரும் வறியவரு நெருங்கி யுண்ணரும் - முதல் - கேட்பாரைக் காண்மின் காண்மின் - வரை
- திருக்குற்றாலக் குறவஞ்சி - வானரங்கள் கனிகொடுத்து
- முக்கூடற் பள்ளு - ஆற்று வெள்ளம் நாளை வரத்
- அபிராமி அந்தாதி- கலையாத கல்வியும் குறையாத வயதும் (பதினாறு செல்வங்கள்)
- திருவரங்கக் கலம்பகம் – மறம் -பிள்ளைப் பெருமாள் ஐயங்கார்-பேசவந்த தூத செல்லரித்த ஓலை செல்லுமோ
- தமிழ்விடு தூது முதல் பத்து கண்ணிகள்

தனிப்பாடல்;

- வான்குருவி யின்கூடு -ஒளவையார்
- ஆமணக்குக்கும் யானைக்கும் சிலேடை ;முத்திருக்கும் கொம்பசைக்கும் மூரித்தண் டே - காளமேகப் புலவர்
- இம்பர் வான் எல்லை இராமனையே பாடி -வீரராகவர்
- நாராய் நாராய் -சத்தி முத்தப் புலவர்

அலகு-3	இக்கால இலக்கியம்- 1

1. பாரதியார் பாரத சமுதாயம் வாழ்கவே
2. பாரதிதாசன் - சிறுத்தையே வெளியில் வா
3. நாமக்கல் கவிஞர்-கத்தியின்றி
4. தமிழ் ஒளி – மீன்கள் (அந்தி நிலா பார்க்க வா)
5. ஈரோடு தமிழன்பன் – எட்டாவது சீர் (வணக்கம் வள்ளுவ)

சிறுகதைகள்;_

1. புதுமைப்பித்தன் - கடிதம்
2. ஜெயகாந்தன் -வாய்ச் சொற்கள் (மாலை மயக்கம் தொகுப்பு)
3. ஆர். சூடாமணி - அந்நியர்கள்

உரைநடை ;

1. மு வ கடிதங்கள் - தம்பிக்கு நூலில் முதல் இரண்டு கடிதங்கள்

அலகு-4	இக்கால இலக்கியம்- 2

1. தந்தை பெரியார் – திருக்குறள்(மாநாட்டு) உரை
2. பேரறிஞர் அண்ணா – இரண்டாம் உலகத் தமிழ் மாநாட்டு உரை
3. கலைஞர் மு. கருணாநிதி – தொல்காப்பிய பூங்கா –எழுத்து -முதல் நூற்பா கட்டுரை

நாடகம் / திரைத்தமிழ் :

1. வேலைக்காரி –திரைப்படம்

	2. ராஜா ராணி -சாக்ரடீஸ் -ஓரங்க நாடகம்

இதழியல் தமிழ் ;

முரசொலி கடிதம்

1. செம்மொழி வரலாற்றில் சில செய்பேடுகள்

அலகு-5	மொழிப் பயிற்சி

<u>சொல் வேறுபாடு / பிழை தவிர்த்தல்</u>

- வாசிப்பது – வாசிப்பவர்
- சுவர்- சுவரில்
- வயிறு - வயிற்றில்
- கோயில்- கோவில்
- கறுப்பு – கருப்பு
- இயக்குநர்-இயக்குனர்
- சில்லறை-சில்லரை
- முறித்தல் – முரித்தல்
- மனம்-மனசு- மனது
- அருகில்-அருகாமையில்
- அக்கரை- அக்கறை
- மங்கலம்- மங்களம்.

பயிற்சி :

- பிழையான சொற்களை ஒரு பத்தியில் கொடுத்து அந்தப் பிழையான சொற்களைச் சரியாக எழுதச் செய்தல்
- சிறிய பத்தி ஒன்றை ஆங்கிலத்தில் கொடுத்து அதனைத் தமிழில் மொழிபெயர்க்க வைத்தல்.

Text books
• .

Reference Books
• மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காதெமி, புதுடெல்லி. • மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை. • தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை. • தமிழ் இலக்கிய வரலாறு –முனைவர்.சிற்பி பாலசுப்ரமணியம், முனைவர்.சொ.சேதுபதி • புதிய தமிழ் இலக்கிய வரலாறு– முனைவர்.சிற்பி பாலசுப்ரமணியம்,நீல.பத்மநாபன் • தமிழ் இலக்கிய வரலாறு - டாக்டர்.அ.கா.பெருமாள் • தமிழ் இலக்கிய வரலாறு –முனைவர். ப.ச.ஏசுதாசன் • தமிழ் இலக்கிய வரலாறு - ஶ்ரீ குமார்

•	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு–பாக்கியமேரி		
•	*தமிழ் பயிற்றும் முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம்*		

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- https://www.chennailibrary.com/
- https://www.sirukathaigal.com
- https://www.tamilvirtualuniversity.org
- https://www.noolulagam.com
- https://www.katuraitamilblogspot.com

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
CLO1	3	2	3	3	3	2	2	2	3	2	3	2
CLO2	3	3	2	2	2	3	2	3	3	2	2	2
CLO3	3	2	3	3	2	2	2	3	2	3	3	2
CLO4		3	3	2	2	2	3	2	3	2	3	3
CLO5	3	3	2	2	2	3	3	2	2	2	3	3

2.

Strong -3,Medium-2,Low-1

பொதுத்தமிழ் -3

தமிழக வரலாறும் பண்பாடும்

இரண்டாம் ஆண்டு – மூன்றாம் பருவம்

Course Code	Course Name	category	L	T	P	S	Credits	Ins.Hrs	CIA	External	Total
	பொதுத்தமிழ் -3 தமிழக வரலாறும் பண்பாடும்	Supportive	Y	-	-	-	3	6	25	75	100

Pre-Requisite	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்	SV 2023	

Learning Objectives

- தமிழக வரலாற்றை அறிந்துகொள்ளுதல்.
- தமிழரின் வாழ்வியல் தொன்மையை அறிதல்.
- தமிழரின் பண்பாட்டினை அறிந்துகொள்ளல்.
- தமிழர்மேல் நிகழ்ந்த பிற பண்பாட்டுத் தாக்கங்களை அறிதல்.
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

Expected Course Outcomes

On the Sucessful completion of the Course, Students will be able to

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO 1	தமிழக வரலாற்றை அறிந்துகொள்வர்.	K4
CO 2	தமிழரின் வாழ்வியல் தொன்மையை அறிவர்.	K5, K6
CO 3	தமிழரின் பண்பாட்டுக் கூறுகளை அறிந்துகொள்வர்	K3
CO 4	பிற பண்பாட்டுத் தாக்கம் மற்றும் அணுகுமுறைகளை அறிவர்.	K3
CO 5	மொழிப்பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்.	K2

K1 - Remember; K2 - Undestand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

அலகு-1	தொல் பழங்கால வரலாறும் சங்ககால வரலாறும்

1. தொல் தமிழர்
2. பழைய கற்காலம்
3. புதிய கற்காலம்
4. உலோகக் காலம்
5. அகழ்வாராய்ச்சியில் தமிழும் தமிழரும் (கீழடி வரை)
6. திணை வாழ்வியல் (களவு வாழ்க்கை, கற்பு வாழ்க்கை, உணவு, அணிகலன்கள், வாணிகம்,விளையாட்டுகள்)

7. கல்வியும், கலைகளும்	
8. தமிழ் வளர்த்த சங்கம்	
9. சங்க கால ஆட்சி முறை	
10 . அயல்நாட்டுத் தொடர்புகள்	
அலகு-2	**ஆட்சியர் வரலாறு**
1. மூவேந்தர் வரலாறு	
2. பல்லவர் வரலாறு	
3. நாய்க்கர் ஆட்சி	
4. முகம்மதியர் ஆட்சி	
5. மராட்டியர் ஆட்சி	
அலகு-3	**ஐரோப்பியர் கால வரலாறு**
1. போர்த்துக்கீசியர்	
2. டச்சுக்காரர்கள்	
3. டேனிஸ்காரர்கள்	
4. பிரெஞ்சுக்காரர்கள்	
5. ஆங்கிலேயர்கள்	
6. பாளையக்காரர்கள்	
7. இந்திய விடுதலைப் போராட்டத்தில் தமிழ்நாடு	
அலகு-4	**விடுதலைக்குபின் தமிழ்நாட்டு வரலாறு**
7. மொழிப்போராட்டம்	
8. சமூக மறுமலர்ச்சி	
9. தொழில்நுட்ப வளர்ச்சி	
அலகு-5	**மொழிப்பயிற்சி**
• நிறுத்தக் குறிகள்	
• கலைச்சொற்கள்	
• மொழிபெயர்ப்பு	
பயிற்சி :ஆங்கிலக் கலைச் சொற்களைக் கொடுத்து அவற்றைத் தமிழில் மொழிபெயர்க்கச் செய்தல்.	
Text books	
• தமிழக வரலாறும் பண்பாடும் - கே.கே. பிள்ளை, உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை,	
• தமிழர் நாகரிகமும் பண்பாடும் - அ. தட்சிணாமூர்த்தி, யாழ் வெளியீடு, சென்னை,.	
• தமிழக வரலாறும் பண்பாடும் - வே.தி. செல்லம், மணிவாசகர் பதிப்பகம், சென்னை,	
• ஆதிச்சநல்லூர் முதல் கீழடி வரை நுவேதா லூயிஸ், கிழக்குப் பதிப்பகம், சென்னை.	
• பண்பாட்டு மானிடவியல் - பக்தவத்சல பாரதி, அடையாளம் பதிப்பகம், திருச்சி.	
• .தமிழர் மேல் நிகழ்ந்த பண்பாட்டுப் படையெடுப்புகள், க.ப. அறவாணன், தமிழ்க்கோட்டம், சென்னை.	

Reference Books
• தமிழக சமுதாய பண்பாட்டு கலை வரலாறு - கு. சேதுராமன், என்.சி.பி.எச், சென்னை,

• தமிழர் கலையும் பண்பாடும் - அ.கா. பெருமாள், என்.சி.பி.எச், சென்னை.

• ஒரு பண்பாட்டின் பயணம்: சிந்து முதல் வைகை வரை - ஆர். பாலகிருஷ்ணன், ரோஜா முத்தையா ஆராய்ச்சி நூலகம், சென்னை.

• தமிழும் பிற பண்பாடும் - தெ.பொ. மீனாட்சி சுந்தரனார், நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை

• தமிழர் வரலாறும் பண்பாடும் - நீலகண்ட சாஸ்திரி, ஸ்ரீசெண்பகா பதிப்பகம், சென்னை

• தமிழர் வரலாறும் தமிழர் பண்பாடும் - மா.இராசமாணிக்கனார்

• தமிழர் நாகரிக வரலாறு - க.த.திருநாவுக்கரசு, தொல்காப்பியர் நூலகம், சென்னை.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

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• https://www.tamilvirtualuniversity.org

• https://www.noolulagam.com

• https://www.katuraitamilblogspot.com

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
CLO 1	3	2	3	2	2	3	2	2	2	2	3	3
CLO 2	2	2	2	3	3	2	2	3	3	2	2	2
CLO 3	3	3	3	2	2	3	3	2	3	3	3	3
CLO 4	3	2	3	3	3	3	2	2	2	2	3	2
CLO 5	2	2	3	3	2	2	3	3	2	3	3	2

Strong -3,Medium-2,Low-1

பொதுத்தமிழ் -4

தமிழும் அறிவியலும்

இரண்டாம் ஆண்டு – நான்காம் பருவம்

Course Code	Course Name	category	L	T	P	S	Credits	Ins.Hrs	CIA	External	Total
	பொதுத்தமிழ் -4 தமிழும் அறிவியலும்	Supportive Y		-	-	-	3	6	25	75	100

Pre-Requisite	பன்னிரெண்டாம் வகுப்பில் தமிழை ஒரு பாடமாகப் பயின்றிருக்க வேண்டும்	SV 2023	

Learning Objectives

- தாய்மொழி வழியாக அறிவியல் பற்றிய சிந்தனைகளை வளர்த்தல்.
- அறிவியல் கலைச் சொல்லாக்கம் பற்றிப் பயிற்றுவித்தல்.
- மாணவர்களுக்கு அறிவியல் பார்வையை ஏற்படுத்துதல்.
- தமிழில் அறிவியல் படைப்பிலக்கியங்களை உருவாக்கத் தூண்டுதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

Expected Course Outcomes

On the Sucessful completion of the Course, Students will be able to

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO 1	தாய்மொழி வழியாக அறிவியல் பற்றிச் சிந்திக்கும் திறன் பெற்றிருப்பர்.	K4
CO 2	அறிவியல் கலைச் சொல்லாக்கம் பற்றிய விதிகள், நுணுக்கங்களைத் தெரிந்திருப்பர்.	K5, K6
CO 3	அறிவியல் தமிழ் வளர்ச்சியில் மொழிபெயர்ப்பின் பங்கு குறித்து அறிந்திருப்பர்.	K3
CO 4	மொழியறிவோடு சிந்தனைத்திறனைப் பெறுவர்	K3
CO 5	மொழிப்பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்.	K2

K1 - Remember; K2 - Undestand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

அலகு-1	தமிழரின் அறிவியல் சிந்தனைகள்

- அறிவியலும் மனித வாழ்வும்
- ஐந்திணைப் பகுப்பும் சூழலியலும்
- தொழில்நுட்ப மேலாண்மை
- நீர் நில மேலாண்மை

அலகு-2	பழந்தமிழ் இலக்கியங்களில் அறிவியல் சிந்தனைகள்

1. நிலவியல்
2. உலோகவியல்

	3. வானவியல்
	4. உயிரியல்
	5. உளவியல்
அலகு-3	இடைக்கால இலக்கியங்களில் அறிவியல் சிந்தனைகள்
	1. காப்பியங்களில் அறிவியல்
	2. சிற்றிலக்கியங்களில் அறிவியல்
	3. உரைநூல்களில் அறிவியல்
அலகு-4	இணையத் தமிழ்
	1. இணையத் தமிழ் பயன்பாடு - அறிமுகம்
	2. இணையத்தமிழ்க் கல்விக்கழகம்
	3. இணைய நூலகம்
	4. செயற்கை நுண்ணறிவியல்
	5. தமிழ்நாட்டு அறிவியல் ஆளுமைகள்
அலகு-5	கடிதம் எழுதுதலும் கட்டுரை எழுதுதலும்

- உறவு முறைக் கடிதப் பயிற்சி
- அலுவலகக் கடிதப் பயிற்சி
- விண்ணப்பப் படிவம் எழுதும் பயிற்சி
- தன் விவரப் படிவம் எழுதும் பயிற்சி
- கருத்து விளக்கக் கட்டுரைகள் எழுதும் பயிற்சி
- பத்திரிகைகளுக்குக் கட்டுரை எழுதும் பயிற்சி

Text books

- அறிவியல் தமிழ் இன்றைய நிலை - இராதா செல்லப்பன், உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை.
- மணவை முஸ்தபா, தமிழில் அறிவியல் படைப்பிலக்கியம், மணவை பப்ளிகேஷன், சென்னை.
- கலைச்சொல்லாக்கம் - மங்கை, ரங்கராசபுரம், சென்னை .
-

Reference Books

1.தமிழர் வேளாண்மை மரபுகள் - இல).செ.கந்தசாமி

- 2. சங்க இலக்கியத்தில் வேளாண் சமுதாயம், பெ.மாதையன், நியூ செஞ்சுரி புக் ஹவுஸ்

  3. தமிழில் அறிவியல் இதழ்கள்சாமுவேல்- ரா.பார்வேந்தன் ஃபிஷ்கிறீன் பதிப்பகம், கோவை

4. அறிவியல் தமிழ் - பதிப்பாசிரியர் இராதா செல்லப்பன்,பாரதிதாசன் பல்கலைக்கழகம், திருச்சிராப்பள்ளி.

5. இணையத் தமிழ் வரலாறு, மு.பொன்னவைக்கோ, பாரதிதாசன் பல்கலைக்கழகம்

6. இணையத் தமிழ், சந்திரிகா சுப்பிரமணியம் - சந்திரோதயம் பதிப்பகம்

7. இணையமும் இனிய தமிழும் - துரை. மணியரசன், இசை பதிப்பகம்

8. கணினித் தமிழ், இல. சுந்தரம் - விகடன் பிரசுரம்

9. மாண்புமிகு மண், பாமயன், வம்சி புக்ஸ்

10. தமிழ் இலக்கியத்தில் அறிவியல் சிந்தனைகள் வானதி பதிப்பகம், சென்னை

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

Web Sources

- https://www.chennailibrary.com/
- https://www.sirukathaigal.com
- https://www.tamilvirtualuniversity.org
- https://www.noolulagam.com
- https://www.katuraitamilblogspot.com

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2	
CLO1	3	2	3	3	3	2	2	2	3	2	3	2	
CLO2	3	3	2	2	2	3	2	3	3	2	2	2	
CLO3	3	2	3	3	2	2	2	3	2	3	3	2	
CLO4		3	3	2	2	2	3	2	3	2	3	3	
CLO5	3	3	2	2	2	3	3	2	2	2	3	3	

3.

Strong -3,Medium-2,Low-

PART – II
ENGLISH
FOR B.A., B.SC., B.COM., B.B.A., PROGRAMMES

MODEL SYLLABUS

FROM THE ACADEMIC YEAR
2023 – 2024

TAMILNADU STATE COUNCIL FOR HIGHER

EDUCATION, CHENNAI – 600 005

Under Graduate Programme

Programme Outcomes:

PO1: Disciplinary Knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO2: Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO3: Problem Solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's earning to real life situations.

PO4: Analytical Reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints.

PO5: Scientific Reasoning: Ability to analyze, interpret and draw conclusions from quantitative / qualitative data; and critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.

PO6: Self-directed & Lifelong Learning: Ability to work independently, identify and manage a project. Ability to acquire knowledge and skills, including "learning how to learn", through self-placed and self-directed learning aimed at personal development, meeting economic, social and cultural objectives.

PO7:Reflective Thing: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society

PO8:Reading & Projects: Document their reading and interpretive practices in assignments, translation works, and independent projects.

PO9:Confidence & Effectiveness: Confidently and effectively articulate their literary and textual experiences.

PO10: **Social Skills & Empathetic Approach**: Reorganize a professional and reflective approach to leadership, responsibility, personal integrity, empathy, care and respect for others, accountability and self regulation.

PAPER II –GENERAL ENGLISH

Programme Specific Outcomes:

PSO1: Identify words, grammar items and structures in English to use them in specific contexts.

PSO2: Recognise, explore and use a range of vocabulary to formulate sentences, paragraphs, letters and other forms of narratives.

PSO3: List, distinguish and practice different ways of sharing ideas in spoken and written forms.

PSO4: Prepare written composition in real life contexts and engage in a range of interactions in the real world

FIRST YEAR - SEMESTER I

PAPER II –GENERAL ENGLISH

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
	Part II	Y	Y	-	-	3	6	25	75	100
Learning Objectives										
LO1	To enable learners to acquireself awareness and positive thinking required in various life situations.									
LO2	To help them acquire the attribute of empathy									
LO3	To assist them in acquiring creative and critical thinking abilities									
LO4	To enable them to learn the basic grammar									
LO5	To assist them in developing LSRW skills									
Unit No.	**Unit Title & Text**							**No. of Periods for the Unit**		
I	**SELF-AWARENESS(WHO)&POSITIVE THINKING(UNICEF)** **Life Story** 1.1 Chapter 1 from MalalaYousafzai, I am Malala 1.2 An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 & 3) M.K.Gandhi **Poem** 1.3 Where the Mind is Without Fear – Gitanjali 35 – Rabindranath Tagore							20		

	1.4 Love Cycle – Chinua Achebe	
II	**EMPATHY** **Poem** 2.1 Nine Gold Medals – David Roth 2.2 Alice Fell or poverty – William Wordsworth **Short Story** 2.3 The School for Sympathy – E.V. Lucas 2.4 Barn Burning – William Faulkner	20
III	**CRITICAL & CREATIVE THINKING** **Poem** 3.1 The Things That Haven't Been Done Before – Edgar Guest 3.2 Stopping by the Woods on a Snowy Evening – Robert Frost **Readers Theatre** 3.3 The Magic Brocade – A Tale of China 3.4 Stories on Stage – Aaron Shepard (Three Sideway Stories from Wayside School" by Louis Sachar)	20
IV	**Part of Speech** 4.1 Articles 4.2 Noun 4.3 Pronoun 4.4 Verb 4.5 Adverb 4.6 Adjective 4.7 Preposition	15
V	**Paragraph and Essay Writing** 5.1 Descriptive 5.2 Expository 5.3 Persuasive 5.4 Narrative **Reading Comprehension**	15

Course Outcomes		
Course Outcomes	On completion of this course,students will:	
CO1	Acquire self awareness and positive thinking required in various life situations	PO1,PO7
CO2	Acquire the attribute of empathy.	PO1,PO2,PO10
CO3	Acquire creative and critical thinking abilities.	PO4,PO6,PO9
CO4	Learn basic grammar	PO4,PO5,PO6
CO5	Development and integrate the use of four language skills i.e., listening, speaking, readingand writing.	PO3,PO8

	Text books (Latest Editions)
1.	MalalaYousafzai. I am Malala, Little, Brown and Company, 2013.
2.	M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter – I), Rupa Publications, 2011.
3.	Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original Bengali. MacMillan, 1913.
4.	N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.
5.	Aaron Shepard. Stories on Stage, ShepardPublications, 2017.
6.	J.C. Nesfield. English Grammar Composition and Usage, Macmillan, 2019.

	Web Resources
1	MalalaYousafzai. I am Malala (Chapter 1) https://archive.org/details/i-am-malala
2	M.K Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter-1)- Rupa Publication, 2011 https://www.indiastudychannel.com/resources/146521-Book-Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx
3	Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings)https://www.poetryfoundation.org/poems/45668/gitanjali-35
4	Aaron Shepard.Stories on Stage, Shepard Publications, 2017 https://amzn.eu/d/9rVzlNv
5	J C Nesfield. Manual of English Grammar and Composition. https://archive.org/details/in.ernet.dli.2015.44179

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
CO5	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to POS	3.0	3.0	3.0	3.0

3 – Strong, 2 – Medium, 1 - Low

FIRST YEAR - SEMESTER II
PAPER II –GENERAL ENGLISH

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
	Part II	Y	Y	-	-	3	6	25	75	100
							Learning Objectives			
LO1		To make students realize the importance of resilience								
LO2		To enable them to become good decision makers								
LO3		To enable them to imbibe problem-solving skills								
LO4		To enable them to use tenses appropriately								
LO5		To help them use English effectively at the work place.								

Unit No.	Unit Title & Text	No. of Periods for the Unit
I	**RESILIENCE** **Poem** 1.1 Don't Quit – Edgar A. Guest 1.2 Still Here – Langston Hughes **Short Story** 1.3 Engine Trouble – R.K. Narayan 1.4 Rip Van Winkle – Washington Irving	20
II	**DECISION MAKING** **Short Story** 2.1 The Scribe – Kristin Hunter 2.2 The Lady or the Tiger - Frank Stockton **Poem** 2.3 The Road not Taken – Robert Frost 2.4 Snake – D. H Lawrence	20
III	**PROBLEM SOLVING** **Prose life Story** 3.1 How I taught My Grandmother to Read – Sudha Murthy **Autobiography** 3.3 How frog Went to Heaven – A Tale of Angolo 3.4 Wings of Fire (Chapters 1,2,3) by A.P.J Abdul Kalam	20

IV	**Tenses** 4.1 Present 4.2 Past 4.3 Future 4.4 Concord	15
V	**English in the Workplace** 5.1 E-mail – Invitation, Enquiry, Seeking Clarification 5.2 Circular 5.3 Memo 5.4 Minutes of the Meeting	15

Course Outcomes		
Course Outcomes	On completion of this course, students will;	
CO1	Realize the importarice of resilience	PO1,PO7
CO2	Become good decision-makers	PO1,PO2,PO10
CO3	Imbibe problem-solving skills	PO4,PO6,PO9
CO4	Use tenses appropriately	PO4, PO5,PO6
CO5	Use English effectively at the work place.	PO3,PO8

TextBooks (LatestEditions)

ReferencesBooks	
1	Martin Hewings. Advanced English Grammar. Cambridge University Press, 2000
2	SP Bakshi, Richa Sharma. Descriptive English.Arihant Publications (India) Ltd., 2019.
3.	Sheena Cameron, Louise Dempsey. The Reading Book: A Complete Guide to Teaching Reading. S & L. Publishing, 2019.
4	Barbara Sherman. Skimming and Scanning Techniques, Liberty University Press, 2014.
5.	Phil Chambers. Brilliant Speed Reading: Whatever you need to read, however. Pearson, 2013.
6.	Communication Skills : Practical Approach Ed.ShaikhMoula

	Ramendra Kumar. Stories of Resilience, Blue Rose Publications, 2020.

<div align="center">Web Sources</div>

1	Langston Hughes. Still Here https://poetryace.com/im-still-here
2	R. K. Narayan. Engine Trouble http://www.sbioaschooltrichy.org/work/Work/images/new/8e.pdf
3	Washington Irving. Rip Van Winkle https://www.gutenberg.org/files/60976/60976-h/60976-h.htm
4	Frank Stockton. The Lady or the Tigerhttps://www.gutenberg.org/ebooks/396

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
CO5	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution toPos	3.0	3.0	3.0	3.0

SECOND YEAR - SEMESTER III
PAPER II –GENERAL ENGLISH

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
	Part II	Y	Y	-	-	3	6	25	75	100

	Learning Objectives
LO1	To make them active listeners
LO2	To enhance the interpersonal relationship skills
LO3	To embolden them to cope with stress
LO4	To master grammar skills
LO5	To help them to use English effectively in a business environment

Unit No.	Unit Title & Text	No. of Periods for the Unit
I	**ACTIVE LISTENING** **Short Story** 1.1 In a Grove – AkutagawaRyunosuke Translated from Japanese by Takashi Kojima 1.2 The Gift of the Magi – O' Henry **Prose** 1.3 Listening – Robin Sharma 1.4 Nobel Prize Acceptance Speech – WangariMaathai	20
II	**INTERPERSONAL RELATIONSHIPS** **Prose** 2.1 Telephone Conversation – Wole Soyinka 2.2 Of Friendship – Francis Bacon **Song on (Motivational/ Narrative)** 2.3 Ulysses – Alfred Lord Tennyson 2.4 And Still I Rise – Maya Angelou	20
III	**COPING WITH STRESS** **Poem** 3.1 Leisure – W.H. Davies 3.2 Anxiety Monster – RhonaMcFerran **Readers Theatre** 3.3 The Forty Fortunes: A Tale of Iran 3.4 Where there is a Will – Mahesh Dattani	20
IV	**Grammar** 4.1 Phrasal Verbs & Idioms 4.2 Modals and Auxiliaries 4.3 Verb Phrases – Gerund, Participle, Infinitive	15
V	**Composition/ Writing Skills** 5.1 Official Correspondence – Leave Letter , Letter of Application, Permission Letter 5.2 Drafting Invitations 5.3 Brochures for Programmes and Events	15

Course Outcomes		
Course Outcomes	On completion of this course, students will;	
CO1	Listen actively	PO1,PO7
CO2	Develop interpersonal relationship skills	PO1,PO2,PO10
CO3	Acquire self-confidence to cope with stress	PO4,PO6,PO9
CO4	Master grammar skills	PO4,PO5,PO6
CO5	Carry out business communication effectively	PO3,PO8

Text Books (Latest Editions)

1	WangariMaathai – Nobel Lecture. Nobel Prize Outreach AB 2023. Jul 2023.
2	Mahesh Dattani, Where there is a Will. Penguin, 2013.
3	Martin Hewings, Advanced English Grammar, Cambridge University Press, 2000
4	EssentialEnglish Grammar by Raymond Murphy

Web Resources

1	WangariMaathai – Nobel Lecture. Nobel Prize Outreach AB 2023. Mon. 17 Jul 2023. https://www.nobelprize.org/prizes/peace/2004/maathai/lecture/
2	Telephone Conversation - Wole Soyinka https://www.k-state.edu/english/westmank/spring_00/SOYINKA.html
3	Anxiety Monster- RhonaMcFerran- www.poetrysoup.com

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
CO5	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0

SECOND YEAR - SEMESTER IV
PAPER II –GENERAL ENGLISH

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	**External**	**Total**
	Part II	Y	Y	-	-	3	6	25	75	100
	Learning Objectives									
LO1	To help learners imbibe goal-setting attitude.									
LO2	To enable them to understand the value of integrity.									
LO3	To help them deal with emotions.									
LO4	To teach the learners to frame sentences using tenses.									
LO5	To enhance reporting skills.									

Unit No.	Unit Title & Text	No. of Periods for the Unit
I	**GOAL SETTING (UNICEF)** **Life Story** 1.1 From Chinese Cinderella – Adeline Yen Mah 1.2 Why I Write - George Orwell **Short Essay** 1.3 On Personal Mastery – Robin Sharma 1.4 On the Love of Life – William Hazlitt	20

II	**INTEGRITY** **Short Story** 2.1The Taxi Driver – K.S. Duggal 2.2 Kabuliwala - Rabindranath Tagore 2.3 A Retrieved Reformation – O Henry **Extract from a play** 2.4 The Quality of Mercy (Trial Scene from the Merchant of Venice - Shakespeare)	20
III	**COPING WITH EMOTIONS** **Poem** 3.1 Pride – Dahlia Ravikovitch 3.2 Phenomenal Woman – Maya Angelou **Reader's Theatre** 3.3 The Giant's Wife A Tall Tale of Ireland – William Carleton 3.4 The Princess and the God : A Tale of Ancient India	20
IV	**Language Competency Sentences** 4.1 Simple Sentences 4.2 Compound Sentences 4.3 Complex Sentences **Direct and Indirect Speech**	15
V	**Report Writing** 5.1 Narrative Report 5.2 Newspaper Report **Drafting Speeches** 5.3 Welcome Address 5.4 Vote of Thanks	15

Course Outcomes

Course Outcomes	On completion of this course, students will	
CO1	Determine their goals	PO1,PO7
CO2	Identify the value of integrity.	PO1,PO2,PO10
CO3	Deal with emotions.	PO4,PO6,PO9
CO4	Frame grammatically correct sentences	PO4,PO5,PO6
CO5	Write cohesive reports.	PO3,PO8

Text Books (Latest Editions)

1	Oxford Practice Grammar , John Eastwood, Oxford University Press
2	Cambridge Grammar of English , Ronald Carter and Michael McCarthy
3.	George Orwell Essays, Penguin Classics

Web Resources

1	http:/www.gradesaver.com/George-orwell-essays/study/summary
2	O' Henry. A Retrieved Reformation. https://americanenglish.state.gov/files/ae/resource_files/a-retrieved-reformation.pdf
	Maya Angelou. Phenomenal Woman. https://www.poetryfoundation.org/poems/48985/phenomenal-woman
3	The Quality of Mercy, https://poemana1ysis.com
4	https://www'.oxfordscho1ar1yeditions.coin/disp1ay/10.1093/actrade/9780199235742.book.1/actrade-9780199235742-div1-106- William Hazilitt

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 – Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
CO5	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0

BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024.**

B.Sc. MATHEMATICS

CHOICE BASED CREDIT SYSTEM –

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Sem.	Part	Course	Title	Ins. Hrs	Credit	Exam Hours	Marks Int.	Ext.	Total
I	I	Language Course – I (LC) Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - I (ELC)		6	3	3	25	75	100
	III	Core Course – I (CC)	Differential Calculus and Trigonometry	5	5	3	25	75	100
		Core Course – II (CC)	Integral Calculus and Fourier Series	5	4	3	25	75	100
		First Allied Course – I (AC)	Computer Science / Physics / Financial Accounting	4	4	3	25	75	100
		First Allied Practical (AP)	Physics / Computer Science	2	-	-	-	-	-
		First Allied Course – II (AC)	Financial Accounting						
	IV	Value Education		2	2	3	25	75	100
		TOTAL		**30**	**21**	**-**	**-**	**-**	**600**
II	I	Language Course - II (LC) Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course - II (ELC)		4	3	3	25	75	100
	III	Core Course – III (CC)	Differential Equations	5	5	3	25	75	100
		Core Course – IV (CC)	Analytical Geometry 3D	5	4	3	25	75	100
		First Allied Practical (AP)	Computer Science / Physics	2	2	3	40	60	100
		First Allied Course – II (AC)	Financial Accounting			3	25	75	
		First Allied Course – II (AC)	Computer Science / Physics	4	4	3	25	75	100
		First Allied Course – III (AC)	Financial Accounting						
		Add on Course – I ##	Professional English- I	*6	4	3	25	75	100
	IV	Environmental Studies		2	2	3	25	75	100
	VI	Naan Mudhalvan Scheme (NMS) @@	Language Proficiency for Employability - Effective English	-	2	3	25	75	100
		TOTAL		**30**	**29**	**-**	**-**	**-**	**900**

Sem	Part	Course	Title	Hours	Credit	Exam	CIA	ESE	Total
III	III	Language Course – III (LC) Tamil $ / Other Languages + #		6	3	3	25	75	100
		English Course – III (ELC)		6	3	3	25	75	100
		Core Course – V (CC)	Classical Algebra and Theory of Numbers	5	5	3	25	75	100
		Core Course – VI (CC)	Sequence and Series	5	4	3	25	75	100
		Second Allied Course – I (AC)	Chemistry / Mathematical Statistics / Management Accounting	4	4	3	25	75	100
		Second Allied Practical (AP)	Chemistry / Mathematical Statistics	2	-	-	-	-	-
		Second Allied Course – II (AC)	Management Accounting						
		Add on Course – II ##	Professional English - II	6*	4	3	25	75	100
	IV	Non-Major Elective I @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level **or** b) Special Tamil if Tamil language was studied upto 10th & 12th std.	Quantitative Aptitude I	2	2	3	25	75	100
		TOTAL		**30**	**25**	**-**	**-**	**-**	**700**
IV	I	Language Course –IV (LC) Tamil $ / Other Languages + #		6	3	3	25	75	100
	II	English Course – IV (ELC)		6	3	3	25	75	100
	III	Core Course - VII (CC)	Vector Calculus and Laplace Transforms	5	5	3	25	75	100
		Core Course – VIII (CC)	Abstract Algebra	5	4	3	25	75	100
		Second Allied Practical (AP)	Chemistry / Mathematical Statistics	2	2	3	40	60	100
		Second Allied Course – II (AC)	Management Accounting			3	25	75	
		Second Allied Course – II (AC)	Chemistry / Mathematical Statistics	4	4	3	25	75	100
		Second Allied Course – III (AC)	Management Accounting	4	4	3	25	75	100
	IV	Non-Major Elective II @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either Basic Tamil if Tamil language was not studied in school level **or** Special Tamil if Tamil language was studied upto 10th & 12th std.	Quantitative Aptitude II	2	2	3	25	75	100
	VI	Naan Mudhalvan Scheme (NMS) @@	Digital Skills for Employability	-	2	3	25	75	100
		TOTAL		**30**	**29**	**-**	**-**	**-**	**800**

V	III	Core Course -IX (CC)	Numerical Methods and MATLAB	5	5	3	25	75	100
		Core Course – X (CC)	Real Analysis	5	5	3	25	75	100
		Core Course – XI (CC)	Statics	5	5	3	25	75	100
		Core Practical – I (CP)	MATLAB Programming Lab	5	4	3	40	60	100
		Major Based Elective – I (Any one from Group - A)		5	4	3	25	75	100
	IV	Skill Based Elective I	Introduction to Latex	3	2	3	25	75	100
		Soft Skills Development		2	2	3	25	75	100
		TOTAL		**30**	**27**	**-**	**-**	**-**	**700**
VI	III	Core Course - XII (CC)	Linear Algebra	5	5	3	25	75	100
		Core Course - XIII (CC)	Complex Analysis	5	5	3	25	75	100
		Core Course - XIV (CC)	Dynamics	5	4	3	25	75	100
		Major Based Elective II (Any one from Group - B)		5	4	3	25	75	100
		Major Based Elective III (Any one from Group - C)		5	3	-	25	75	100
	IV	Skill Based Elective – II	Mathematics for Competitive Examinations	3	2	3	25	75	100
	V	Gender Studies		2	1	3	25	75	100
		Extension Activities **		-	1	-	-	-	-
	VI	Naan Mudhalvan Scheme (NMS) @@		-	2	3	25	75	100
		TOTAL		**30**	**27**	**-**	**-**	**-**	**800**
		GRAND TOTAL		**180**	**154**	**-**	**-**	**-**	**4500**

LIST OF ALLIED COURSES:

First Allied Course (Any one)

1. Computer Science
2. Physics
3. Financial Accounting

Second Allied Course (Any one)

1. Chemistry
2. Mathematical Statistics
3. Management Accounting

LIST OF MAJOR BASED ELECTIVE COURSES:

Group A (Any one)

1. Operations Research
2. Stochastic Processes

Group B (Any one)

1. Graph Theory
2. Introduction to Python Programming

Group C (Any one)

1. Astronomy
2. Number Theory

SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES

Sl. No.	Part	Types of the Course	No. of Courses	No. of Credits	Marks
1.	I	Language Courses	4	12	400
2.	II	English Courses	4	12	400
3.		Core Courses	14	70	1400
4.		Core Practical	1	4	100
5.	III	Allied Courses I & II	4	16	400
6.		Allied Practical	2	4	200
7.		Major Based Elective Courses	3	6	300
8.		Add –on Course (Professional English I & II)	2	8	200
9.		Non Major Elective Courses	2	4	200
10.		Skill Based Elective Courses	2	4	200
11.	IV	Soft Skill Development	1	2	100
12.		Value Education	1	2	100
13.		Environmental Studies	1	2	100
14.	V	Gender Studies	1	1	100
15.		Extension Activities	1	1	0
16.	VI	Naan Mudhalvan Scheme	3	6	300
		Total	**46**	**154**	**4500**

PROGRAMME LEARNING OBJECTIVES:

- To have a comprehension of the instruments required to have the option to quantitatively examine and comprehend the common and social world,
- To be able to take care of issues, think scientifically, and reason quantitatively.
- To be able to get to and convey Mathematical data.
- To take an interest effectively in Mathematics related occasions in particular Conferences/Seminars/Workshops and Quiz programs.

PROGRAMME OUTCOMES:

Area information: Demonstrate information on essential ideas, standards and uses of the particular science discipline.

Logical and Technical Skills: Ability to deal with/utilize suitable apparatuses/strategies/gear with a comprehension of the standard working methods, wellbeing perspectives/impediments.

Basic reasoning and Problem settling: Identify and basically break down appropriate issues in the important order utilizing proper instruments and strategies just as ways to deal with coming to feasible end results/arrangements.

Individual and collaboration: Exhibit the possibility to successfully achieve assignments freely and as a part or pioneer in various groups, and in multidisciplinary settings.

Powerful Communication: Communicate successfully in spoken and composed structure just as through electronic media with mainstream researchers just as with society on the loose.

Society: Analyse the effect of logical and innovative advances on nature and society and the requirement for reasonable improvement.

Morals: Commitment to proficient morals and duties.

Deep-rooted learning: Ability to participate in long-lasting learning with regard to the fast advancements in the control.

PROGRAMME SPECIFIC OUTCOMES:

- Explicate the concepts of pure and applied Mathematics by demonstrating the knowledge and understanding of the mathematical principles in multidisciplinary environments.
- Demonstrate a computational ability in solving a wide array of mathematical problems.
- Utilize mathematical skills of the logical and scientific approach.
- Appreciate the beauty of Mathematics with the attainment of proficiency in problem solving, computational skills, critical thinking, technical and quantitative reasoning.

*****

First Year   **CORE COURSE I**   **Semester I**
                          DIFFERENTIAL CALCULUS AND
                          TRIGONOMETRY
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To inculcate what a derivative is in terms of the idea of a tangent line to the graph of a function, how a derivative can be used to describe the rate of change of one quantity with respect to another, and how to relate the geometric ideas to the analytic ideas.
- To understand intuitive explanation of the process of taking a limit, to compute basic limits of functions and understand the importance of limits to the process of differentiation and be able to compute the derivative of a simple function.
- To know continuity as related to functions and able to relate an intuitive notion of continuity to the mathematical definition of continuity, to compare and contrast the ideas of continuity and differentiability.
- To recognize and use the vocabulary of angles (including standard position, initial and terminal sides, quadrantal angles, acute, right, and obtuse angles)
- To know the usage of right triangles to evaluate the six trigonometric functions
- To compute the six trigonometric functions of any angle and use the unit circle to define the six trigonometric functions for all real numbers.

UNIT – I:

Functions and Limits: Constants and variables – Functions – Classification of functions - Limits.

UNIT – II:

Methods of Successive Differentiation – Leibnitz's Theorem and its applications-Increasing & Decreasing functions –Maxima and Minima of functions of two variables.

UNIT – III:

Curvature – Radius of curvature in Cartesian and Polar Coordinates – Centre of curvature– Radius of curvature – Evolutes& Involutes

UNIT – IV:

Expansions of $\sin(nx)$, $\cos(nx)$, $\tan(nx)$– Expansions of $\sin^n x$, $\cos^n x$ –Expansions of $\sin(x)$, $\cos(x)$, $\tan(x)$ in powers of x.

UNIT – V:

Hyperbolic functions – Relation between hyperbolic & Circular functions- Inverse hyperbolic functions.

UNIT – VI   CURRENT CONTOUR (For Continuous Internal Assessment Only):

The Double angle formulas and The Half-angles identities.

REFERENCES:

1. S. Narayanan and T.K. Manicavachagam Pillai, **Calculus Volume I**, S. Viswanathan (Printers & Publishers) Pvt. Limited , Chennai -2011.
2. S. Arumugam & others, **Trigonometry and Fourier series**, New Gamma Publications -1999

    UNIT – I   : Chapter I Sections 1 to 10 of [1]
    UNIT – II   : Chapter III Sections 1.1 to 2.2, Chapter IV Section 2.1, 2.2 &
                      Chapter V 1.1 to 1.4 of [1]
    UNIT – III   : Chapter X Sections 2.1 to 2.6 of [1]
    UNIT – IV   : Chapter 1 Section 1.2 to 1.4 of [2]
    UNIT – V   : Chapter 2 Section 2.1 & 2.2 of [2]
3. S. Arumugam and Isaac, Calculus, Volume1, New Gamma Publishing House, 1991.
4. S. Narayanan, T.K. Manichavasagam Pillai, Trigonometry, S. Viswanathan Pvt. Limited, and Vijay Nicole Imprints Pvt. Ltd, 2004.

COURSE OUTCOME:

After completing this course, the students will be able to;

*   Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.
*   Compare and contrast the ideas of continuity and differentiability.
*   Find maxima, minima, critical points and inflection points of functions and to determine the concavity of curves.
*   Convert angles from degrees to radians and vice versa.
*   Compute the length of a circular arc given the radius and the interior angle.
*   Understand the definitions of the inverse trigonometric functions, compute the domain and range of the hyperbolic and inverse trigonometric functions and to find exact values of composite functions with inverse trigonometric functions.

*****

First Year **CORE COURSE II** **Semester I**
INTEGRAL CALCULUS AND FOURIER SERIES
Code: **(Theory)** **Credit: 4**

COURSE OBJECTIVES:

- To get exposed to the concepts of reduction formulae and Fourier series.
- To apply double and triple integral to find the area and volume.
- To understand the concepts of Beta and Gamma functions and their applications.

UNIT – I:

Definite integrals - Integration by parts and reduction formulae.

UNIT – II:

Geometric Application of Integration-Area under plane curves: Cartesian co-ordinates -Area of a closed curve - Examples - Areas in polar co-ordinates.

UNIT – III:

Double integrals – changing the order of Integration – Triple Integrals.

UNIT – IV:

Beta and Gamma functions and the relation between them –Integration using Beta and Gamma functions.

UNIT – V:

Fourier series- definition - Fourier Series expansion of periodic functions with Period 2π – Use of odd & even functions in Fourier Series. Half-range Fourier Series – Development in Cosine series – Development in Sine series.

UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Chemical, Physical and Biomedical Applications of Fourier series.

REFERENCES:

1. S. Narayanan and T.K. Manicavachagam Pillai, Calculus Volume II, S. Viswanathan (Printers & Publishers) Pvt. Limited, Chennai -2011.
2. S. Narayanan, T.K. Manicavachagam Pillai, Calculus, Vol. III, S. Viswanathan Pvt. Limited, and Vijay Nicole Imprints Pvt. Ltd, 2004.

     UNIT – I   : Chapter 1 section 11, 12 & 13 of [1]
     UNIT – II   : Chapter 2 section 1.1, 1.2, 1.3 & 1.4 of [1]
     UNIT – III   : Chapter 5 section 2.1, 2.2 & 4 of [1]
     UNIT – IV   : Chapter 7 section 2.1 to 2.5 of [1]
     UNIT – V   - Chapter 6 Section 1, 2, 3, 4, 5.1, 5.2 of [2]

REFERENCES:

1. Shanti Narayan, Differential & Integral Calculus.
2. Dr. S. Arumugam and Prof. A. ThangapandiIssac, Fourier series, New Gamma Publishing house.

COURSE OUTCOMES:

After completing this course, the students will be able to:

- Derive reduction formula and thereby evaluate some standard integrals.
- Explain the properties of Beta and Gamma functions and apply it to compute the integral.
- Identify odd and even functions and determine Fourier series expansion of these given functions.
- Apply change of variable method to evaluate double integral.
- Utilize double and triple integral to compute area and volume of a solid.

*****

First Year   **CORE COURSE III**   **Semester II**
                           DIFFERENTIAL EQUATIONS
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To know the order and degree of the ODE's.
- To study DEs and PDEs of first and second order.
- To identify some specific methods and solve them.
- To make difference between ODE and PDE.
- To know some standard methods.

UNIT – I:

Equations of the first order and first degree – Variable separable – Homogeneous, Non-homogeneous, Linear equations – Bernoulli's equation – Exact differential equations: Sufficient condition for exact differential equations – Practical rules for solving exact differential equations.

UNIT – II:

First order, higher degree differential equations– Equations solvable for dy/dx, solvable for y, solvable for x, Clairaut's form – Homogeneous equations in x and y– simple problems.

UNIT – III:

Particular integrals of second order differential equations with constant coefficients - Linear equations with variable coefficients – Method of Variation of Parameters (Omit third & higher order equations)..

UNIT – IV:

Formation of Partial Differential Equation – General, Particular & Complete integrals – Solution of PDE of the standard forms - Lagrange's method - Charpit's method and few standard forms.

UNIT – V:

PDE of second order homogeneous equation with Constant coefficients – Particular integrals of the forms e^{ax+by}, Sin(ax+by), Cos(ax+by), $x^r y^s$ and $e^{ax+by}.f(x,y)$.

UNIT – VI   CURRENT CONTOUR (For Continuous Internal Assessment Only):

Moving Boundary Value Problems

REFERENCES:

1. T.K. Manicavachagam Pillay & S. Narayanan, Differential Equations, S. Viswanathan Publishers Pvt. Ltd., 1996.
2. Arumugam & Isaac, Differential Equations, New Gamma Publishing House, Palayamkottai, 2003.

    UNIT – I   : Chapter II – Sections 1,2,3,4,5,6 of [1]
    UNIT – II   : Chapter IV – Sections 1,2 & 3 of [1]
    UNIT – III   : Chapter V – Sections 1,2,3,4 & 5, Chapter VIII – Section 4 of [1]
    UNIT – IV   : Chapter XII – Sections 1 – 6 of [1]
    UNIT – V   : Chapter V of [2]
3. M.D. Raisinghania , Ordinary and Partial Differential Equations, S. Chand & Co.
4. M.K. Venkatraman, Engineering Mathematics, S.V. Publications, 1985 Revised Edition.

COURSE OUTCOMES:

After completing this course, the students will be able to:

- Solve first-order ordinary differential equations.
- Solve higher order differential equations.
- Solve the Higher order differential equations using methods of variation of parameter.
- Solve partial differential equations using Lagrange's Method.

*****

First Year   **CORE COURSE IV**   **Semester II**
                    ANALYTICAL GEOMETRY 3D
Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To study three dimensional Cartesian Co-ordinates system.
- To enable the students to develop their skill in three dimensions

UNIT – I:

Symmetrical form of equation of a straight line – Equation of a straight line passing through two given points – Condition for a line to be parallel to a plane – Angle between a plane and a line – Condition for two straight lines to be coplanar – Shortest Distance between two given lines.

UNIT – II:

Sphere – Equation of a sphere when the centre and radius are given – Plane section of a sphere – Equation of a circle – Intersection of two spheres – The equation of a tangent plane to a sphere.

UNIT – III:

Equation of a surface – Cone – Right Circular cone – Intersection of a straight line and quadric cone – Tangent plane and normal.

UNIT – IV:

Condition for a plane to touch a quadric cone - angle between lines in which a plane cuts a cone – Condition that a cone has three mutually perpendicular generators.

UNIT – V:

Central quadrics – intersection of a line and a quadric – tangents and tangent planes – condition for a plane to touch a conicoid.

UNIT – VI   CURRENT CONTOUR (For Continuous Internal Assessment Only):

An Introduction to Geo Gebra software.

REFERENCES:

1. T Manickavasagam Pillay, T.K. and Natarajan. T, A Text of Analytical Geometry – Part II – Three dimensions, S. Viswanathan (Printers & Publishers) Pvt. Ltd. 2005,

   UNIT – I   : Chapter III – Sections 1 to 8
   UNIT – II   : Chapter IV – Sections 1 to 8
   UNIT – III   : Chapter V – Sections 1 to 4

UNIT – IV   : Chapter V – Sections 5 to 7
UNIT – V   : Chapter V – Sections 9 to 12
2. Shanthi Narayanan and Mittal P.K, Analytical Solid Geometry, 16thEdition S. Chand & Co., New Delhi.

COURSE OUTCOMES:

After completing this course, the students will be able to:

- Gain knowledge about the regular geometrical figures and their properties.
- Analyze condition of tangency and find the tangent plane to the sphere.
- Examine the condition for the general equation of the cone.
- Understand the concept of quadric cone and its properties.
- Acquire the basic knowledge of tangents and conicoid.

*****

Second Year　　　　　　　　　**CORE COURSE V**　　　　　　　　**Semester III**
　　　　　　　　　CLASSICAL ALGEBRA AND THEORY OF NUMBERS
Code:　　　　　　　　　　　　　　**(Theory)**　　　　　　　　　　**Credit: 5**

COURSE OBJECTIVES:

- To lay a good foundation for the study of Theory of Equations.
- To train the students in operative algebra.

UNIT – I:

Relation between roots & coefficients of Polynomial Equations – Symmetric functions – Sum of the rth Powers of the Roots

UNIT – II:

Newton's theorem on the sum of the power of the roots-Transformations of Equations – Diminishing, Increasing & Multiplying the roots by a constant - Reciprocal equations - To increase or decrease the roots of an equation by a given quantity.

UNIT – III:

Form of the quotient and remainder – Removal of terms – To form an equation whose roots are of any power – Transformation in general – Descarte's rule of sign.

UNIT – IV:

Inequalities – elementary principles – Geometric & Arithmetic means – Weirstrass inequalities – Cauchy inequality – Applications to Maxima & Minima.

UNIT – V:

Theory of Numbers – Prime & Composite numbers – divisors of a given number N – Euler's Function ϕ(N) and its value – The highest Power of a prime P contained in N! – Congruences – Fermat's, Wilson's & Lagrange's Theorems.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Linear Diophantine equation

REFERENCES:

1. T.K. Manickavasagam Pillai & others, Algebra Volume I, S.V. Publications – 1985 Revised Edition.
2. T.K. Manickavasagam Pillai & others, Algebra Volume II, S.V. Publications – 1985 Revised Edition.
   UNIT – I   : Chapter 6 Section 11 to 13 of (1)
   UNIT – II : Chapter 6 Section 14 to 17 of (1)
   UNIT – III : Chapter 6 Section 18- 21 & 24 of (1)
   UNIT – IV : Chapter 4 of (2)
   UNIT – V : Chapter 5 of (2)
3. H.S. Hall and S.R. Knight, Higher Algebra, Prentice Hall of India, New Delhi.

COURSE OUTCOMES: After completing this course, the students will be able to

- Know the foundation of Theory of Equations.
- Applying the skills to solve problems in operative algebra.

*****
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Second Year	CORE COURSE VI	Semester III
	SEQUENCES AND SERIES	
Code:	(Theory)	Credit: 4

COURSE OBJECTIVES:

- Learn to work with infinite sequences and series.
- Learn to work with infinite bounded sequences.
- Learn to work with an infinite monotonic sequences.
- Learn to work with an infinite convergent or divergent sequences.
- Find the sequences of partial sums of an infinite series.
- Determine if a geometric series is convergent or divergent.
- Find the sum of a convergent geometric series.

UNIT – I:

Sequences – Bounded Sequences – Monotonic Sequences – Convergent Sequences – Divergent Sequences – Oscillating sequences

UNIT – II:

Algebra of Limits – Behavior of Monotonic functions

UNIT – III:

Some theorems on limits – subsequences – limit points – Cauchy sequences.

UNIT – IV:

Series – infinite series – Cauchy's general principal of convergence – Comparison – test theorem and test of convergence using comparison test (comparison test statement only, no proof).

UNIT – V:

Test of convergence using dAlembert's ratio test – Cauchy's root test – Alternating Series – Absolute Convergence (Statement only for all tests).

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction Power series.

REFERENCES:

1. Dr. S. Arumugam & Mr. A. Thangapandi Isaac Sequences and Series – New Gamma Publishing House, 2002 Edition.
   UNIT – I : Chapter 3 Sections 3.0 – 3.5 Page No : 39-55
   UNIT – II : Chapter 3 Sections 3.6, 3.7 Page No:56 – 82
   UNIT – III: Chapter 3 Sections 3.8-3.11, Page No:82-102
   UNIT – IV: Chapter 4 Sections (4.1 & 4.2) Page No : 112-128.

UNIT – V : Relevant part of Chapter 4 and Chapter 5: Sec. 5.1 & 5.2 Page No: 157-167.
2. Algebra – Prof. S. Surya Narayan Iyer
3. Algebra – Prof. M.I. Francis Raj

Course Outcomes: After completing this course, the students will be able to

- Determine if an infinite sequence is bounded.
- Determine if an infinite sequence is monotonic.
- Determine if an infinite sequence is convergent or divergent.
- Find the sequence of partial sums of an infinite series.
- Determine if a geometric series is convergent or divergent.
- Find the sum of a convergent geometric series.
- Determine if an infinite series is convergent or divergent by selecting the appropriate test.
- Determine if an infinite series converges absolutely or conditionally.

*****

QUANTITATIVE APTITUDE I

Code: **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To lean the problems solving techniques for aptitude problems
- To enable to students prepare themselves for various competitive examinations

UNIT – I:

Numbers – HCF – LCM – Problems on numbers

UNIT – II:

Decimal Fractions and Simplification

UNIT – III:

Surds and Indices – Percentage – Profit and Loss

UNIT – IV:

Ratio and Proportion – Partnership – Allegation or Mixture

UNIT – V:

Average – Problems on Age

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Theory of sets and puzzles

REFERENCES:

1. Scope and treatment as in "Quantitative Aptitude" by R.S. Aggarwal, S. Chand & Company Ltd., Ram Nagar, New Delhi (2007)
   UNIT – I : (Chapters 1, 2 & 7)
   UNIT – II   : (Chapter 3 & 4)
   UNIT – III   : (Chapters 9, 10 & 11)
   UNIT – IV   : (Chapters 12, 13 & 20)
   UNIT – V   : (Chapters 6 & 8)

COURSE OUTCOMES:

- Remembering the numbers.
- Define surds and indices. Recalling the various areas that is problems on ages, percentage, profit and loss and ratio and proportion.
- Solve the problems on ratio and proportion, partnership and average.

*****

Second Year **CORE COURSE VII** **Semester IV**
VECTOR CALCULUS AND LAPLACE
TRANSFORMS
Code: **(Theory)** **Credit: 5**

COURSE OBJECTIVES:

- Understand the fundamental concepts of vector differentiation.
- Compute line, Surface & volume integral by using Green's, Stokes & Gauss Divergence theorem.
- Apply Laplace Transform to solve differential equations

UNIT – I:

Vector differentiation –velocity & acceleration-Vector & scalar fields –Gradient of a vector- Directional derivative – divergence & curl of a vector solinoidal & irrotational vectors – Laplacian double operator –simple problems.

UNIT – II:

Vector integration –Tangential line integral –Conservative force field –scalar potential-Work done by a force - Normal surface integral- Volume integral – simple problems.

UNIT – III:

Gauss Divergence Theorem – Stoke's Theorem- Green's Theorem – Simple problems and Verification of the theorems for simple problems.

UNIT –IV:

Laplace Transforms – Standard formulae – Laplace transform of Periodic functions – Some general theorems & simple applications.

UNIT – V:

Inverse Laplace Transforms – Use of Laplace Transforms in solving ODE with constant coefficients.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Z Transforms

REFERENCES:

1. M.L. Khanna, Vector Calculus, Jai Prakash Nath and Co., 8th Edition, 1986.
2. S. Narayanan, T.K. Manicavachagam Pillai, Calculus, Vol. III, S. Viswanathan Pvt. Limited, and Vijay Nicole Imprints Pvt. Ltd, 2004.
   UNIT – I : Chapter 1 Section 1 & Chapter 2 Sections 2.3 to 2.6 , 3 , 4 , 5 , 7 of [1]
   UNIT – II   : Chapter 3 Sections 1 , 2 , 4 of [1]

UNIT – III   : Chapter 3 Sections 5 & 6 of [2]
UNIT – IV   : Chapter 5 Section 1,2,3,4,5 of [2]
UNIT – V   : Chapter 5 Section 6,7,8 of [2]

3. P. Duraipandiyan and Lakshmi Duraipandian, Vector Analysis, Emarald Publishers (1986).
4. Dr. S. Arumugam and Prof. A. Thangapandi Issac, Fourier series, New Gamma Publishing House (Nov 12).

COURSE OUTCOMES: After completing this course, the students will be able to

- Learn the basic knowledge of vector differentiation and vector integration
- Solve vector differentiation and integration problems.
- Introduce the basic concepts of Laplace Transforms.
- Solve a differential equation by using Laplace Transforms

*****

COURSE OBJECTIVES:

• To introduce the basic concepts of modern algebra.
• To introduce the concepts of group theory and rings.

UNIT – I:

Groups: Definition and Examples – Elementary Properties of a Group – Equivalent Definitions of a Group.-Permutation Groups.

UNIT – II:

Subgroups – Cyclic Groups – Order of an Element – Cosets and Lagrange's Theorem.

UNIT – III:

Normal Subgroups and Quotient Groups - Isomorphism –Homomorphism.

UNIT – IV:

Rings: Definitions and Examples - Elementary properties of rings –Isomorphism - Types of rings.-Characteristic of a ring – subrings – Ideals - Quotient rings.

UNIT – V:
Maximal and Prime Ideals - Homomorphism of rings – Field of quotient of an integral domain – unique factorization domain – Euclidean domain.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Polynomial rings

REFERENCES:

1. S Arumugam and A. Thangapandi Isaac, Modern Algebra, SciTech Publications, Chennai, 2003.
   UNIT – I : Chapter 3 Sections 3.1-3.4
   UNIT – II   : Chapter 3 Sections 3.5-3.8
   UNIT – III   : Chapter 3 Sections 3.9-3.11
   UNIT – IV   : Chapter 4 Sections 4.1-4.8
   UNIT – V   : Chapter 4 Sections 4.9- 4.11, 4.13-14
2. N. Herstein, Topics in Algebra, John Wiley & Sons, Student 2nd edition, 1975.
3. Vijay, K. Khanna and S.K. Bhambri, A Course in Abstract Algebra, Vikas Publishing House Pvt. Ltd.

COURSE OUTCOMES: After completing this course, the students will be able to

- Demonstrate the abstract structures of algebra
- Prove standard theorems of groups and rings
- Check irreducibility of polynomial and verify whether a function is an isomorphism or not
- Determine cosets, automorphism, kernel, maximal and prime ideals
- Develop examples of groups and rings with specific criterions.
- Students will be able to determine whether a given group is abelian by checking the properties.
- Prove that a given subset of a group is a subgroup by applying the properties.
- Describe all elements in a cyclic subgroup by using generators.

*****

Second Year   **NON MAJOR ELECTIVE II**   **Semester IV**
                      QUANTITATIVE APTITUDE II
Code: **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To learn the problems solving techniques for aptitude problems
- To enable to students prepare themselves for various competitive examinations

UNIT – I:

Chain Rule – Time and Work – Pipes and Cisterns

UNIT – II:

Time and Distance –Problems on Trains – Boats and Streams

UNIT – III:

Simple Interest – Compound Interest - Stocks and Shares.

UNIT – IV:

Clocks – Area – Volume and Surface Area.

UNIT – V:

Permutations and Combinations

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Mathematical riddles

REFERENCES:

1. Scope and treatment as in "Quantitative Aptitude" by R.S. Aggarwal, S. Chand & Company Ltd., Ram Nagar, New Delhi - 2015
   UNIT – I : Chapters 14, 15 & 16
   UNIT – II   : Chapters 21, 22 & 29
   UNIT – III   : Chapters 17, 18 & 19
   UNIT – IV   : Chapters 24, 25 & 28
   UNIT – V   : Chapters 30 & 31

COURSE OUTCOMES: After completing this course, the students will be able to

- Solve the problems on time and distance, work and wages, pipes and cisterns.
- Recalling simple interest, compound interest and logarithm.
- Improve the problem solving skill on areas, volumes and data interpretation

*****

Third Year   **CORE COURSE IX**   **Semester V**
NUMERICAL METHODS AND MATLAB
Code: **(Theory)**   **Credit: 5**

COURSE OBJECTIVES:

- To introduce the exciting world of programming to the students through MATLAB.
- To introduce the techniques of Numerical methods.
- To solve numerical problems using MATLAB programming

UNIT – I:

MATLAB Environment: Getting Started – Solving Problems in MATLAB – Saving your works – Predefined MATLAB Functions – Using Predefined Functions – Manipulating Matrices – Computational Limitations-Special Values and Functions.

UNIT – II:

Plotting: Introduction to Two Dimensional Plotting – Three Dimensional Plotting – Editing Plots from the Menu Bar – Creating Plots from the Workshop Window. Programming in MATLAB: Introduction – Problems with Two Variables – Input/Functions – Statement level Control Structures.

UNIT – III:

Numerical Techniques: Introduction – Curve Fitting: Linear and Polynomial Regression – Using the Interactive Fitting Tools – Numerical Integration – Numerical Differentiation.

UNIT – IV:

Curve Fitting – Fitting Linear and parabolic curves by the method of least squares principles Solving algebraic and transcendental equations-Bisection method, false position method and Newton Raphson method – Solving simultaneous algebraic equations – Guass-seidal method – Guass elimination method.

UNIT – V:

Interpolation – Newton's forward and backward difference formulae – Lagrange's interpolation formula – Numerical integrations using Trapezoidal and Simpson's one – third rules – solution of ODE's – Euler method and Runge-Kutta fourth order method.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Error analysis of Numerical Methods

REFERENCES:

1. Delores M. Etter, David C. Kuncicky, Holly Moore. Introduction to MATLAB, Published by Dorling Kindersley (India) Pvt. Ltd., licenses of Pearson Education in South Asia.
2. M.K. Venkatraman, Numerical methods in Science and Engineering, National Publisher Company, Fifth Edition, 2001 (For Units IV and V).
   UNIT – I : Chapter 2&3 of [1]
   UNIT – II   : Chapter 4&5 of [1]
   UNIT – III   : Chapter 8 of [1]
   UNIT – IV   : Chapter 1, Sections 1.7-1.8, Chapter 3, Sections 2, 4 and 5, Chapter 4,   Sections 2, 6 of [2]
   UNIT – V   : Chapter 6, Sections 3 & 4, Chapter 8 Section 4, Chapter 9   Sections 8 & 10, Chapter 11 Sections 10 & 16 of [2].
3. Yashavant. P. Kanetkar, Let us 'C', BPB Publications, 2002.
4. Rajaraman, Computer oriented numerical methods, Prentice-Hall of India, 1971.

COURSE OUTCOMES: After completing this course, the students will be able to

- Understanding the exciting world of programming through MATLAB.
- Know the techniques of Numerical Methods.
- Apply the MATLAB programming to solve numerical problems.

*****

COURSE OBJECTIVES:

- To understand the axioms of the real numbers, supremum, infimum, upper limits.
- To know open and closed sets in $\mathbb{R}$, continuity and differentiability of functions, L'Hôpital's Rule, Taylor's and the Mean Value Theorems and metric spaces.
- To develop in a rigorous and self-contained manner the elements of real variable functions.
- To enable students to learn functions of bounded variation, grasp basic concepts about the connectedness, compact metric spaces.

UNIT – I:

Introduction – Sets and functions – Countable and Uncountable sets – Inequalities of Holder and Minkowski – Metric spaces – Definition and Examples – Bounded sets in a metric space – Open Ball in a Metric space – Open sets.

UNIT – II:

Subspace – Interior of a set – Closed sets – Closure – Limit point – Dense sets – Completeness – Baire's Category theorem.

UNIT – III:

Continuity – Homeomorphism – Uniform Continuity.

UNIT – IV:

Connectedness – Definition and examples – Connected subsets of R – Connectedness & Continuity.

UNIT – V:

Compact Metric spaces – Compact subsets of R – Equivalent Characterization for Compactness – Compactness and Continuity.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Introduction to Basic topology

REFERENCES:

1. Dr. S. Arumugam & Mr. A. Thangapandi Issac, Modern Analysis, New Gamma Publishing House, Palayamkottai, Fourth reprint 2021.
   UNIT – I   : Chapter 1 Sections 1.1 to 1.4, Chapter 2 Sections 2.1 to 2.5
   UNIT – II   : Chapter 2 Sections 2.6 to 2.11 & Chapter 3

UNIT – III   : Chapter 4 Sections 4.1 to 4.4
UNIT – IV   : Chapter 5
UNIT – V   : Chapter 6

2. Ajit Kumar and S. Kumaresan, A Basic Course in Real Analysis, CRC Press, 2014.

COURSE OUTCOMES: After completing this course, the students will be able to

- Explain the concepts such as real valued functions, continuity, connectedness, compactness, etc.
- Prove standard theorems in real analysis
- Distinguish between upper bound and lower bound; continuity and uniform continuity of a function; limit point and interior point; and bounded and totally bounded.
- Characterize structures of connected sets, nowhere dense sets, continuity of a function, compact sets and category of sets.
- Generate sets and functions of required nature.

******

Third Year   CORE COURSE XI   **Semester V**
                                    STATICS
Code: (Theory)   **Credit: 5**

COURSE OBJECTIVES:

- To provide the basic knowledge of equilibrium of a particle.
- To develop a working knowledge to handle practical problems.

UNIT – I:

Introduction – Forces acting at a point: Triangle of forces – Resolving of a force – Condition of equilibrium.

UNIT – II:

Parallel forces and Moments: Resultant of parallel forces – Theorems on Moments – Moment about an axis – couples.

UNIT – III:

Equilibrium of three forces acting on a rigid body: Conditions of equilibrium – Trigonometrical theorems and problems - Coplanar forces: Reduction of Coplanar forces – Equation of Line of action of the resultant **–** Conditions of equilibrium.

UNIT – IV:

Friction: Introduction – Laws of Friction – Definitions – Equilibrium of a particle on a rough inclined plane.

UNIT – V:

Equilibrium of strings: Equation of the Common Catenary -Parabolic Catenary.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Introduction to Virtual work

REFERENCES:

1. M.K. Venkataraman, Statics, Agasthiyar Publications, 17th edition, 2014.
   UNIT – I : Chapter1, Chapter2.
   UNIT – II : Chapter 3, Chapter 4.
   UNIT – III   : Chapter 5 (Section 1-6), Chapter 6 (Section 1-12).
   UNIT – IV   : Chapter 7 (Section 1-13) Pages: 206 – 238.
   UNIT – V : Chapter 9 (Section 1- 8)
2. A.V. Dharmapadham, Statics, S. Viswanathan Publishers Pvt.Ltd, 2006.
3. P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam, Mechanics S. Chand& Company PVT, LTD, 2014.
4. S.L. Lony, Elements of Statics and Dynamics, Part-I, A.I.T.B.S. Publishers, 2007.

COURSE OUTCOMES: After completing this course, the students will be able to

- The course deals the study of internal and external forces in a structure.
- Provide the basic knowledge of Equilibrium of a particle.
- Develop a working knowledge to handle practical problems.

*****

Third Year   **CORE PRACTICAL I**   **Semester V**
MATLAB PROGRAMMING LAB
Code: **(Practical)**   **Credit: 4**

COURSE OBJECTIVES:

- To solve numerical problems using MATLAB programming.

LIST OF PRACTICALS

1. Linear Interpolation
2. Linear Regression
3. Curve Fitting
4. Trapezoidal rule of Integration
5. Simpson's 1/3 rule of Integration
6. Newton – Raphson method of solving equations
7. Gauss Elimination method of solving simultaneous equations
8. Gauss – Seidal method of solving simultaneous equations
9. R-K fourth order method of solving differential equations
10. Lagrange's method of interpolation

COURSE OUTCOMES: After completing this course, the students will be able to

- Experience the programming skills through numerical methods.
- Know basic commands in MATLAB programming.
- Solve numerical problems using MATLAB programming.

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Third Year   **MAJOR BASED ELECTIVE I**   **Semester V**
                        1. OPERATIONS RESEARCH
Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- The course aims at building capabilities in the students for analyzing different situations in the industrial/ business scenario involving limited resources and finding the optimal solution within constraints.
- This module aims to introduce students to use quantitative methods and techniques for effective decision–making; model formulation and applications that are used in solving business decision problems.
- To know Linear Programming (LP) and allocation of resources, LP definition, Linearity requirement
- To know and solve Maximization and Minimization problems.
- To know Graphical LP Minimization solution, Introduction, Simplex method definition, formulating the Simplex model.
- To learn Linear Programming – Simplex Method for Maximizing.

UNIT – I:

Linear programming problem - Mathematical formulation – Illustrations on Mathematical formulation on Linear Programming Problems – Graphical solution method - some exceptional cases - Canonical and standard forms of Linear Programming Problem - Simplex method.

UNIT – II:

Use of Artificial Variables (Big M method - Two phase method) – Duality in Linear Programming - General primal-dual pair - Formulating a Dual problem - Primal-dual pair in matrix form -Dual simplex method.

UNIT – III:

Transportation problem - LP formulation of the TP - Solution of a TP - Finding an initial basic feasible solution (NWCM - LCM -VAM) – Degeneracy in TP - Transportation Algorithm (MODI Method) - Assignment problem - Solution methods of assignment problem – special cases in assignment problem.

UNIT – IV:

Queuing theory - Queuing system - Classification of Queuing models - Poisson Queuing systems Model I (M/M/1)(∞/FIFO) only - Games and Strategies – Two person zero sum - Some basic terms - the maximin-minimax principle -Games without saddle points-Mixed strategies - graphic solution $2 \times n$ and $m \times 2$ games.

UNIT – V:

PERT and CPM – Basic components – logical sequencing - Rules of network construction- Critical path analysis - Probability considerations in PERT.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Applications of OR in Financial Management, Budgeting and Investments

REFERENCES:

1. Kanti Swarup, P.K. Gupta and Man Mohan, Operations Research, 13th edition, Sultan Chand and Sons, 2007.
   UNIT – I: Chapter 2 Sections 2.1 to 2.4, Chapter 3 Sections 3.1 to 3.5, Chapter 4 Sections 4.1 , 4.3
   UNIT – II: Chapter 4 Section 4.4, Chapter 5 Sections 5.1 to 5.4, 5.9
   UNIT – III: Chapter 10 Sections 10.1, 10.2, 10.8, 10.9, 10.12 & 10.13, Chapter 11 Sections 11.1 to 11.4
   UNIT – IV: Chapter 21 Sections 21.1, 21.2, 21.7 to 21.9, Chapter 17 Sec 17.1 to 17.6
   UNIT – V: Chapter 25 Sections 25.1 to 25.4, 25.6, 25.7
2. Sundaresan. V, Ganapathy Subramanian. K.S. and Ganesan. K, Resource Management Techniques, A.R. Publications, 2002.
3. Taha H.A., Operations Research: An introduction, 7th edition, Pearson Prentice Hall, 2002.

COURSE OUTCOMES: After completing this course, the students will be able to

- Demonstrate the basic concepts of LPP, game theory, queuing models and networks
- Make use of different methods to get optimality in LPP, TP, AP and games
- Check the existence of alternate / infeasible / unbounded solutions
- Evaluate the solution of primal using duality, optimal solution by characteristics of queuing system
- Convert possible real life problems into OR model.

*****

COURSE OBJECTIVES:

- To know probability and distribution function
- To understand the concept of Stochastic Processes
- To identify Markov chains, Poisson Process and birth and death Process
- To know the concept of queuing theory with some examples

UNIT – I:

Generating function - Laplace transforms – Laplace transforms of a probability distribution function - Difference equations – Differential difference equations – Matrix analysis.

UNIT – II:

Stochastic Process - Notion – Specification – Stationary Process - Markov Chains – Definition and examples – Higher transition probabilities.

UNIT – III:

Classification of states and chains – Determination of higher transition probabilities – Stability of Markov system – Limiting behaviour.

UNIT – IV:

Poisson Process and related distributions – Generalization of Poisson Process – Birth and death process.

UNIT – V:

Stochastic Process in queuing and reliability – queuing systems – M/M/1 models – Birth and death process in queuing theory – Multi channel models – Bulk Queues.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Branching Processes

REFERENCES:

1. J. Medhi, Stochastic Processes, Chapters 1,2,3 (Omitting 3.6,3.7,3.8), Chapter 4 (Omitting 4.5 and 4.6) and Chapter 10 (Omitting 10.6,10.7).
   UNIT – I : Chapter 1 – Sec 1.1, 1.2, 1.3, Appendix A 1, 2, 3, 4.
   UNIT – II: Chapter 2 – Sec 2.1, 2.2, 2.3 & Chapter 3 – Sec 3.1, 3.2.
   UNIT – III: Chapter 3 – Sec 3.4, 3.5, 3.6.
   UNIT – IV: Chapter 4 – Sec 4.1, 4.2, 4.3, 4.4
   UNIT – V: Chapter 10 – Sec 10.1, 10.2, 10.3, 10.4, 10.5

2. First Course in Stochastic Processes by Samuel Karlin.
3. Stochastic Processes by Srinivasan and Metha (TATA McGraw Hill).
4. Elements of Applied Stochastic Processes by V. Narayan.

COURSE OUTCOMES: After completing this course, the students will be able to

- State the defining properties of various stochastic process models.
- Identify appropriate stochastic process model(s) for a given research or applied problem.
- Provide logical and coherent proofs of important theoretic results.
- Apply the theory to model real phenomena and answer some questions in applied sciences.

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Third Year   **SKILL BASED ELECTIVE I**   **Semester V**
                            INTRODUCTION TO LATEX
Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To make the students learn the art of typing mathematics text on their own.
- To inculcate professional training required to become a scholar in mathematics.

UNIT – I:

Basic Structure of Latex 2e - Input file structure - Layout -Editors - Forward Search - Inverse Search - Compiling - Conversion to various formats.

UNIT – II:

Typesetting simple documents - sectioning - Titles- page layout - listing –enumerating - quote - letter formats.

UNIT – III:

Using package amsmath typing equations labeling and referring.

UNIT – IV:

Figure inclusion - Table inclusion.

UNIT – V:

Bibliography - Index typing - Beamer presentation Styles.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Type a mathematical article using various journal style files

REFERENCES:

1. Leslie Lamport. LATEX: A Document Preparation System, Addison-Wesley, Reading, Massachusetts, second edition, 1994.
2. Tobias Oetiker, Hubert Partl, Irene Hyna and Elisabeth Schlegl., The (Not So) Short Introduction to LATEX2e, Samurai Media Limited (or available online at http://mirrors.ctan.org/info/lshort/english/lshort.pdf)
3. LATEX Tutorials - A Primer, Indian TeX Users Group, available online at https://www.tug.org/twg/mactex/tutorials/ltxprimer-1.0.pdf
4. H. J. Greenberg. A Simplified introduction to LATEX, available online at https://www.ctan.org/tex-archive/info/simplified-

latex/
5. Using Kile - KDE Documentation, https://docs.kde.org/trunk4/en/extragear_office/kile/quick-using.html
6. Amsmath and geometry package available in Ctan.org.

COURSE OUTCOMES: At the end of the course, students will be able to

1. Type their own mathematical article/notes/book/journal paper/project work.
2. Meticulously prepare their own mathematical notes.
3. Understand basic structure of Latex 2e and conversions of them to various formats.
4. Typeset and compile documents with titles, sectioning and enumeration etc.
5. Use various style files and in particular amsmath, amsfonts, amsthm.
6. Understand how to align math equations, matrices etc.
7. Include the figures in various formats into their latex document and compile it successfully.
8. Utilize bibtex feature of including bibliographies and indexes.

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Third Year	**CORE COURSE XII**	**Semester VI**
	LINEAR ALGEBRA	
Code:	**(Theory)**	**Credit: 5**

COURSE OBJECTIVES:

To inculcate vector space, linear independence, linear transformations, matrix operations, determinants, Eigen values and Eigen vectors, and applications.

UNIT – I:

Vector spaces: Vector spaces – Definition and examples – Subspaces-linear transformation – Span of a set.

UNIT – II:

Basis and Dimension: Linear Independence – Basis and Dimension –Rank and Nullity.

UNIT – III:

Matrix and Inner product space: Matrix of a linear transformation -Inner product space – Definition and examples – Orthogonality– Gram Schmidt orthogonalisation process – Orthogonal Complement.

UNIT – IV:

Theory of Matrices: Algebra of Matrices - Types of Matrices – The Inverse of a Matrix –Elementary Transformations – Rank of a matrix.

UNIT – V:

Characteristic equation: Characteristic equation and Cayley -Hamilton theorem – Eigen values and Eigen vectors.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

The algebra of polynomials

REFERENCES:

1. Arumugam S and Thangapandi Isaac A, Modern Algebra, SciTech Publications (India) Ltd., Chennai, Edition 2012.
   UNIT – I : Chapter 5, Sec 5.1 to 5.4
   UNIT – II   : Chapter 5, Sec 5.5 to 5.7
   UNIT – III   : Chapter 5,Sec 5.8, Chapter 6, Sec 6.1 to 6.3
   UNIT – IV   : Chapter 7 Sec 7.1 to 7.5
   UNIT – V   : Chapter 7, Sec 7.7, 7.8
2. I.N. Herstein, Topics in Algebra, Second Edition, John Wiley & Sons(Asia), 1975

COURSE OUTCOMES: After completing this course, the students will be able to

- Define basic concepts of vector spaces, linear transformations, inner product spaces.
- Prove standard theorems in Linear Algebra
- Distinguish linear independence and dependence; singular and nonsingular linear transformations; quadratic and diagonal forms.
- Determine basis and dimension of vector space, orthogonal basis, eigen values, eigen vector and posets.
- Construct orthonormal basis from a given basis; to reduce a quadratic form to diagonal form.

*****

COURSE OBJECTIVES:

- To introduce the fundamental ideas of the functions of complex variables and developing a clear understanding of the fundamental concepts of Complex Analysis such as analytic functions.
- Understand the concepts of complex integration and series expansions such as Cauchy's integral formula and its derivative, Taylor's series, Laurent's series and singularities.
- To acquire the knowledge and develop manipulation skills in the use of Rouche's theorem.
- Understand and learn to use Argument Principle and the principal of Analytic Continuation and the concerned results.

UNIT – I:

Functions of a Complex variable –Limits-Theorems on Limits –Continuous functions – Differentiability – Cauchy-Riemann equations – Analytic functions – Harmonic functions.

UNIT – II:

Elementary transformations - Bilinear transformations – Cross ratio – fixed points of Bilinear Transformation – Some special bilinear transformations.

UNIT – III:

Complex integration - definite integral – Cauchy's Theorem –Cauchy's integral formula –Higher derivatives.

UNIT – IV:

Series expansions – Taylor's series – Laurant's Series – Zeroes of an analytic functions – Singularities.

UNIT – V:

Residues – Cauchy's Residue Theorem –Evaluation of definite integrals.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Harmonic Functions

REFERENCES:

1. S. Arumugam, A. Thangapandi Isaac, & A. Somasundaram, Complex Analysis, New Scitech Publications (India) Pvt. Ltd, 2002.

UNIT – I : Chapter 2 section 2.1 to 2.8
UNIT – II   : Chapter 3 Sections 3.1 to 3.5
UNIT – III   : Chapter 6 sections 6.1 to 6.4
UNIT –IV   : Chapter 7 Sections 7.1 to 7.4
UNIT – V   : Chapter 8 Sections 8.1 to 8.3
2. J.N. Sharma, Functions of a Complex variable, Krishna Prakasan Media(P) Ltd, 13th Edition, 1996-97.
3. T.K. Manickavachaagam Pillai, Complex Analysis, S. Viswanathan Publishers Pvt. Ltd, 1994.

COURSE OUTCOMES: After completing this course, the students will be able to

- Becoming familiar with the concepts Complex numbers and their properties and operations with Complex number.
- Finding domain and range of complex functions and sketching their graphs.
- Evaluating limits and checking the continuity of complex function.
- Checking differentiability and Analyticity of functions.
- Evaluate Complex integrals and applying Cauchy integral.

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Third Year　　　　　　　　**CORE COURSE XIV**　　　　　　　**Semester VI**
　　　　　　　　　　　　　　　DYNAMICS
Code:　　　　　　　　　　　**(Theory)**　　　　　　　　　　**Credit: 4**

COURSE OBJECTIVES:

- Understand the fundamental concepts of velocity and acceleration.
- Understand the work done in stretching an elastic string Simple Harmonic motion.
- Study the motion of projectiles, impact of sphere and central orbits.

UNIT – I:

Introduction-Kinematics: Velocity-Relative Velocity-Angular Velocity-Acceleration-Relative Acceleration-Motion in a straight line under uniform acceleration.

UNIT – II:

Projectile: Projectile-Path of a projectile-Characteristics-Horizontal projection-Projectile up/down in an inclined plane.

UNIT – III:

Collision of Elastic Bodies: Introduction-Definitions-Fundamental Laws of impact-Impact of a smooth sphere on a fixed smooth plane-Direct impact of two smooth spheres-Oblique impact of two smooth spheres-Dissipation of energy due to impact-Compression and Restitution-Impact of a particle on a rough plane.

UNIT – IV:

Simple Harmonic Motion: Introduction-S.H.M. in straight line-Compositions of simple harmonic motions of the same period.

UNIT – V:

Motion Under The action Of Central Forces: Velocity and acceleration in polar coordinates-Equiangular spiral-Differential Equation of central orbits-Pedal Equation of the central orbit-Two-fold problems in central orbits.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Impulsive forces

REFERENCES:

1. Dr. M.K. Venkataraman, Dynamics, Agasthiyar Publications, Thirteenth Edition, July 2009.
   UNIT – I : Chapter 2, Chapter 3, Section 3.1-3.22
   UNIT – II : Chapter 6, Sections 6.1-6.16
   UNIT – III　　　: Chapter 8, Sections 8.1-8.11
   UNIT – IV　　　: Chapter 10, Sections 10.1-10.13
   UNIT – V : Chapter 11, Sections 11.1-11.11
2. P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam, Mechanics S. Chand & Company Pvt. Ltd., 2014.
3. A.V. Dharmapadham, Dynamics, S. Viswanathan Publishers Pvt. Ltd. 2006.

COURSE OUTCOMES: After completing this course, the students will be able to

- Acquire knowledge about the basic concepts of kinematics.
- Analyze the motion of Projectiles and their results.
- Critique the concepts of Central Orbits, differential equation of a central orbit.

COURSE OBJECTIVES:

• To introduce the notion of graph theory and its applications.
• To introduce some of the most important notions of Graph Theory and develop their skills and solving basic exercises.

UNIT – I:

Introduction - The Konigsberg Bridge Problem - Graphs and subgraphs: Definition and Examples - Degrees - Subgraphs - Isomorphism – independent sets and coverings.

UNIT – II:

Matrices - Operations on Graphs - Walks, Trails and Paths –Connectedness and Components - Eulerian Graphs.

UNIT – III:

Hamiltonian Graphs (Omit Chavatal Theorem) - Characterization of Trees - Centre of a Tree.

UNIT – IV:

Planarity: Introduction - Definition and Properties - Characterization of Planar Graphs.

UNIT – V:

Directed Graphs: Introduction - Definitions and Basic Properties – Some Applications: Connector Problem - Kruskal's algorithm - Shortest PathProblem – Dijkstra's algorithm.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Independent Sets and Matchings

REFERENCES:

1. S. Arumugam and S. Ramachandran, Invitation to Graph Theory, SciTech Publications (India) Pvt. Ltd., Chennai, 2006.
   UNIT – I : Chapter-1 Sec 1.0, 1.1 and Chapter -2 Sec 2.0, 2.1, 2.2, 2.3, 2.4.2.6
   UNIT – II: Chapter-2 Sec 2.8,2.9 ,Chapter-4 Sec 4.1,4.2 and Chapter-5 Sec 5.0,5.1
   UNIT – III: Chapter-5 Sec 5.2, Chapter-6 Sec 6.0,6.1,6.2.
   UNIT – IV: Chapter-8 Sec 8.0,8.1,8.2.
   UNIT – V: Chapter-10 Sec 10.0, 10.1 Chapter-11 Sec 11.0,11.1,11.2

2. Narsingh Deo, Graph Theory with applications to Engineering and Computer Science, Prentice Hall of India, 2004.
3. Gary Chartrand and Ping Zhang, Introduction to Graph Theory, Tata Mc Graw-Hill Edition, 2004.

COURSE OUTCOMES: After completing this course, the students will be able to

- To understand and apply the fundamental concepts in graph theory.
- To apply graph theory based tools in solving practical problems
- To understand the trees
- The students will be able to know the planarity.
- To explain the Kruskal's algorithm and Dijkstra's algorithm.

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Third Year **MAJOR BASED ELECTIVE II** **Semester VI**
2. INTRODUCTION TO PYTHON PROGRAMMING
Code: **(Theory)** **Credit: 4**

COURSE OBJECTIVES:

1. To learn the basics of scientific computing through Python Programming.
2. To inculcate professional training in algorithmic approach of Problem Solving.

UNIT – I:

Review of Linux commands; File management and permissions; Using VI editor; Introducing a programming language, syntax, basic tools, simple programmes, etc.

UNIT – II:

Basic Tools; First Program file; Handling complex numbers; Functions and loops; Standard math functions; Conditionals; Python keywords and function names; Defining Names.

UNIT – III:

Lists in Python; Defining and accessing lists; Loops with lists; Range function; for loop with lists for sorting; Built-in sort functions; else class in loops; slicing lists; lists as stacks; using lists as queues; new lists from old.

UNIT – IV:

Data types; Numeric Types; Tuples; Accepting tuple inputs; sorting iterables; the lambda function; Sets; Dictionaries; Input and output; Output formatting; Format specifiers; align, sign, width, precision, type; File operations; Functions from Numpy and Scipy libraries.

UNIT – V:

Math problems for practice which includes the following: (a) Finding GCD of two or more integers; (b) Primality checking; Finding primes upto a given integer; (c) Plotting curves; (d) Area of a triangle; (e) Angle between vectors; (f) Convert a number in decimal to a given base n. (g) Transpose of a matrix; Product of two matrices; (h) Finding the mean; median; mode; standard deviation etc., of a given data;

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Inheritance and Encapsulation

REFERENCES:

1. Real Python, A Practical introduction to Python, https://static.realpython.com/python-basics-sample-chapters.pdf
2. Qingkai Kon et all, Python Programming and Numerical Methods - A Guide for Engineers and Scientists, https://pythonnumericalmethods.berkeley.edu/notebooks/Index.html

COURSE OUTCOMES: After completing this course, the students will be able to

- Comprehend Python Programming and basic commands.
- Use basic tools, functions and loops.
- Get expertise in Standard math functions.

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COURSE OBJECTIVES:

* To introduce the exciting world of astronomy to the students.
* To help the students to study spherical trigonometry in the field of astronomy.
* To understand the movements of the celestial objects.

UNIT – I:

Relevant properties of sphere and formulae in spherical trigonometry (no proof, no problems) - Celestial sphere and diurnal motion -Celestial coordinates-sidereal time.

UNIT – II:

Morning and evening stars -circumpolar stars- diagram of the celestial sphere -zones of earth -perpetual day-dip of horizon-twilight.

UNIT – III:

Refraction - laws of refraction -tangent formula-Cassini's formula - horizontal refraction-geocentric parallax -horizontal parallax.

UNIT – IV:

Kepler's laws - verification of 1st and 2nd laws in the case of earth - Anomalies -Kepler's equation - Seasons -causes -kinds of years.

UNIT – V:

Moon-sidereal and synodic months - elongation - phase of moon - eclipses-umbra and penumbra - lunar and solar eclipses - ecliptic limits - maximum and minimum number of eclipses near a node and in a year - Saros.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Introduction to Astrophysics

REFERENCES:

1. Kumaravel, S. and Susheela Kumaravel,   *Astronomy*, 8th Edition, SKV Publications, 2004.
    UNIT – I : Sections 39-79
    UNIT – II : Sections 80-90,106-116
    UNIT – III   : Sections 117-144
    UNIT – IV   : Sections 146-162,173-178
    UNIT – V : Sections 229-241,256-275
2. G V Ramachandran, Text Book of Astronomy, Mission Press, Palayamkottai, 1965.

COURSE OUTCOMES: After completing this course, the students will be able to

* The Learner will acquire basic knowledge about morning, evening stars, circumpolar stars.
* Solve the problems with scientific reasoning and critical thinking skills.
* Calculation to prepare calendar and conservation of time.

2. NUMBER THEORY
Code: **(Theory)**   **Credit: 3**

COURSE OBJECTIVES:

- To highlight the niceties and nuances in the world of numbers.
- To prepare the students for coding through congruences.

UNIT – I:

Euclid's Division Lemma – Divisibility – The Linear Diophantine Equation – The Fundamental Theorem of Arithmetic.

UNIT – II:

Permutations and Combinations – Fermat's Little Theorem – Wilson's Theorem – Generating Functions.

UNIT – III:

Basic Properties of Congruences Residue Systems. Linear Congruences – The Theorems of Fermat and Wilson Revisited.

UNIT – IV:

The Chinese Remainder Theorem – Polynomial Congruences – Combinational Study of F(n).

UNIT – V:

Formulae for d(n) and s(n) – Multiplicative Arithmetic Function – The Mobius Inversion Formula.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Prime number theorem and its applications.

REFERENCES:

1. Number Theory by George E. Andrews, Hindustan Publishing Corporation – 1984, Edition.
   UNIT – I : Chapter - 2 Sec. 2.1 – 2.4 pages 12-29
   UNIT – II: Chapter – 3 Sec. 3.1, 3.4 pages 30-44
   UNIT – III: Chapter – 4Sec. 4.1 – 4.2 Pages 49 – 55, Sec. 5.1- 5.2 Pages 58-65
   UNIT – IV: Chapter – 4 Sec. 5.3 – 5.4 pages 66-74, Sec. 6.1 Pages 75-81
   UNIT – V: Chapter – 5 Sec. 6.2 – 6.3 Pages 82-92
2. Basic Number Theory by S.B. Malik, Vikas Publishing House Pvt. Ltd.,
3. A First Course Theory of Numbers by K.C. Chowdhury. Asian Books Pvt. Ltd., I Edition (2004)

COURSE OUTCOMES: After completing this course, the students will be able to

- Understand the concepts of divisibility and fundamental theorem of arithmetic.
- The students will know about the Fermat's theorem and Wilson theorem.
- Understand the congruences.
- Solve using Chinese remainder theorem.
- Understand the Mobius inversion formula.

Third Year   **SKILL BASED ELECTIVE II**   **Semester VI**
MATHEMATICS FOR COMPETITIVE
EXAMINATIONS
Code: **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To gain quantitative aptitude required in the present scenario.
- To emphasize the right perceptive needed to crack such problems and understand the recurring pattern in those problems.

UNIT – I:

Problems on Numbers- Average-Problems on Ages.

UNIT – II:

Percentage-Profit & Loss-Simple Interest-Compound Interest.

UNIT – III:

Ratio & Proportion-Partnership-Calender-Clocks.

UNIT – IV

Time and work-Pipes & Cistern.

UNIT – V:

Time & Distance-Problems on Trains-Boats and Streams.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Simple problems using sets, functions, group theory etc.

REFERENCES:

1. Dinesh Khattar, The Pearson Guide to Quantitative Aptitude for Competitive Examinations, Pearson Education, 3 edition, 2015.

Course Outcomes: At the end of the course, students will be able to

- Face competitive examinations with confidence.
- Solve a lot of problems on numbers and averages and problems on ages.
- Get a lot of training on percentage, profit and loss.
- Crack problems on calculating simple interest and compound Interest.
- Work on a plenty of problems on time and work.
- Get working knowledge on ratios and proportions.
- Calculate time, distance, speed given the other two and solve lot of problems.
- Acquire problem solving ideas on trains, boats and streams.

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TOUR OPERATIONS

Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

- To know the definition and concepts of tourism
- To understand the types of travel formalities
- To learn the Preparation of Tour Itinerary

UNIT- I   TRANSPORT INDUSTRY:

Introduction to Transport Industry – Road Transport – Rail Transport - Cruise Liners Transportation - Reading of Railway Time Table – Railway Ticket Booking Procedures.

UNIT-II   AIR TRANSPORT:

Development of Air Transport – Formation of IATA – Airline Industry (International and Domestic) - Role of Airlines in Tourism.

UNIT-III   TRAVEL FORMALITIES:

Passport – VISA – Medical Certificates – Insurance – Customs - Foreign Exchange -Baggage allowance.

UNIT-IV   TRAVEL AGENCY:

Evolution of Travel Agency – Departments and Functions of a Travel Agency - Source of income for Travel Agency.

UNIT-V   TOURS OPERATIONS:

Origin of Tour Operations – Organising a Tour Program – Package Tours – Car Rentals – Tourist Guide Service -Preparation of Tour Itinerary – Tour Costing.

UNIT - VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

Railway Ticket Booking Procedures - Baggage allowance - Organizing a Tour Program - Preparation of Tour Itinerary.

REFERENCE BOOKS:

1. Burkart and Melik, **Tourism -Past, Present and Future**, London, 1995.
2. R.M. Kaul, **Dynamics of Tourism** – **A Triology**, Vol.I., New Delhi, 1997.
3. Seth Pran Nath, Successful Tourism Practices, Vol.I., New Delhi, 1997.
4. Lonely Planet India, Guidebook, Travel literature

COURSE OUTCOME:

- Successful completion of this course will lead the students to appropriate knowledge in Tour operations.

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CULTURAL TOURISM

Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

1. To gain the knowledge of Cultural Resources.
2. To understand the idea of Cultural Festivals
3. To get the knowledge of Cultural destinations.

UNIT- I   CULTURAL TOURISM:

Definition - Meaning and Scope - Significance – Types of CulturalTourism Attractions - Culinary Traditions: North Indian - South Indian -Continental.

UNIT-II   ARTS AND CRAFTS :

Music: Hindustani   - Carnatic -Classical   Dances: Kuchipudi, Odisi, Kathakali, Manipuri,Kadhak and Bharathanattiyam - Folk Dances.

UNIT-III   CULTURAL RESOURCES OF NORTH INDIA :

Madura- Jaipur-Vaishnavadevi Temple Deccan Region: Konark – Amaravati- Somnathpur Temple -South India : Belur, Helibidu, Gurauvayur, Thiruppati- Madurai- Case studies: Darasuram, Velankanni.

UNIT-IV   FESTIVALS:

Konark Festival in Odisha - Sarang Festival in Kolkata - Music Festival in Chennai- -Dance Festivals in Mamallapuram and Chidambaram - Music Festival in Thiruvaiyaru.

UNIT-V   INDIAN CULTURAL DESTINATION – CULTURAL INSTITUTION IN INDIA:

Cultural Event Management – Preservation and Conservation of Monuments – Role of ASI, ICO, MOS -Mutts in India- Unique features of Tamil Culture: Chastity, Equality, Nobility, Charity , Justice.

UNIT - VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

Hindustani Music - Culinary traditions of South India - Konark Festival–Role of ASI in heritage conservation.

REFERENCES :

1. V.s. Agarwal, the Heritage of Indian Art, Publications Divisions, Govt. of India, New Delhi.
2. A.L. Basham, The Wonder That was India, 3rd edition, London.
3. L. Basham, A Cultural History of India, Oxford University Press, New Delhi.
4. பண்டையநாகரிகங்கள் - எஸ்.எல். வி . மூர்த்தி
5. Art, Culture and Spirituality - Swami Atmaramananda&Dr.M.Sivaramkrishna.
6. The Book of Hindu Festivals and Ceremonies - Om Lata Bahadur.
7. Cultural Tourism In India- Luvkushmishra

COURSE OUTCOME:

- Successful completion of this course will lead the students to appropriate knowledge in Cultural Tourism.

BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-IV ENVIRONMENTAL STUDIES COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

First Year   **PART-IV**   **Semester-II**
                                    ENVIRONMENTAL STUDIES
Code: **(Theory)**   **Credit: 2**

COURSE OBJECTIVES:

- To appreciate the scope of Environmental Studies, Community ecology and the interdisciplinary nature of environmental issues
- To have a basic knowledge of Natural resources its classification, concepts, and natural resources of India.
- The course designed to gain knowledge on values of biodiversity and conservation on global, national, and local scales
- To study about sources and effects of environmental pollution like air, water, soil, thermal, marine, nuclear and noise
- To understand the concerns related to Sustainable Development on environment and health
- To introduce the students in the field of Law and Policies and Acts both at the national and international level relating to environment.

UNIT-1:   The Multidisciplinary nature of environmental studies
            Definition, scope and importance.   (2 lectures)
            Need for public awareness

UNIT-2:   Natural Resources:
            Renewable and non-renewable resources:
            Natural resources and associated problems.

   a)   Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
   b)   Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.

   c)   Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.

f) Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 lectures)

Unit: 3   Ecosystems

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

(6 lectures)

Unit: 4   Biodiversity and its conservation

- Introduction – Definition : Genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Biological Diversity Act 2002/ BD Rules, 2004

(8 lectures)

Unit: 5   Environmental Pollution

2

Definition

Causes, effects and control measures of :
a.   Air Pollution
b.   Water Pollution
c.   Soil Pollution
d.   Marine Pollution
e.   Noise pollution
f.   Thermal Pollution
g.   Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides.
- Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards, Types of Fire, Firework and Safety

(8 lectures)

Unit: 6   Social Issues and the Environment

- From Unsustainable to Sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people; its problems and concerns.
Case studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation
- Public awareness.

(7 lectures)

Unit: 7   Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights - Value Education

- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

Unit: 8   Field Work

- Visit to a local area to document environmental assets-river / forest/ grassland/ hill / mountain

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p

(M) Magazine   (R) Reference   (TB) Textbook

23. http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20

COURSE OUTCOMES:

- Understand the environmental importance including interactions across local to global scales.
- The learners to update and analyze environmental relationships and interactions of environmental components
- The student to gain knowledge on importance of natural resources in a systematic way.

- The course content is introduce the concept of renewable and non-renewable energy resources and its scenario in India and at global level
- The students will know the relationship between biodiversity and ecosystem functions, direct and indirect values of biodiversity resources and their bioprospecting opportunities.
- The learners can gain awareness related on environmental pollution, causes and pollution control with case studies.
- Student to obtain the environmental ethics and gain knowledge about the sustainable development.
- Learners should realize the environmental legislation and policies of national and international regime and know the regulations applicable to industries and other organizations with significant Environmental aspects

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BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-V GENDER STUDIES COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year   <mark>PART-V</mark>   **Semester-<mark>VI</mark>**
GENDER STUDIES

Code: **(Theory)**   **Credit: 2**

OBJECTIVES:

- To make students to aware of Gender constructions and gendering Process
- To explore existing gender biases in the society and to understand the need to work towards the inclusive society
- To inculcate sensitivity and build gender perspectives.
- To use the course to bring attitudinal cum behavioral changestowards gender neutral ambience and promote the humanistic values

UNIT- I   INTRODUCTION TO GENDER STUDIES CONCEPTS

Gender Spectrum.-Sex – Gender distinction – Biological Determinism – Patriarchy – Feminism –Gender Socialization and Stereotyping-Gender Discrimination – Gender Division of labour and roles– Gender Sensitivity and awareness – Gender Equity – Equality – Gender Main streaming and Gender Analysis.

UNIT- II   UGC INITIATIVES ON WOMEN'S STUDIES

Definition of Women's Studies –Gender Studies –UGC Initiatives and guidelines on Women's Studies - Beijing Conference, UN Initiatives – Convention on Elimination of All forms of

Discrimination Against Women (CEDAW)- Sustainable Development Goals on Gender Equality (SDG 5) and targets

UNIT- III   AREAS OF GENDER DISCRIMINATION

Gender Socialization- Sex Ratio– Health and Nutrition– – Literacy and Education - Employment- Governance – participation in decision making- politics- property rights and access to credit- gender based violence- Social institutions –Family, Caste, Class, religion, gender, State. Market – Media – Politics – Judiciary

UNIT -IV   WOMEN DEVELOPMENT AND GENDER EMPOWERMENT

Towards Equality Report of Status of Women in India 1974 – International Women's Decade – International Women's Year –National Policy for Empowerment of Women 2001

UNIT -V   WOMEN'S MOVEMENTS AND SAFEGUARDING MECHANISM :

 In India National /State Commission for Women(NCW) – All Women Police Station – Family Court Legislations safeguarding women –Transgender Policy—Constitutional amendments for women's political participation

UNIT - VI   CURRENT CONTOURS: (for continuous internal assessment only):

Tamil Nadu State Policy for Women 2021- National Policy for Women 2015 – Prevention of Sexual Harassment at Work places Act 2013-
Protection of Children from Sexual Offences Act, 2012 - Analysis of regressive and progressive High court and supreme court judgments- women proactive policies, programmes, interventions

REFERENCE :

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication ,2000
5. பாலியலை புரிந்து கொள்வோம், மதுரை :ஏக்தா,………..
6. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency ,2001
7. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003

8. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002
9. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999
10. அஜிதா, குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005, மதுரை : ஏக்தா 2005
11. பொன்.கிருஷ்ணசாமி,ஜே.பால் பாஸ்கர்&ஆ.ஜான் வின்சென்ட், பெண்களும் உச்ச நீதிமன்றமும், மதுரை :சோக்கோ வாசகர் வட்டம், 2004
12. குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005- கையேடு, திருச்சி: Women's Integrated National Development Trust
13. https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/

COURSE OUTCOMES:

- Students would have gained a perspective and understood the social reality of gender society understood the differences of gender and sex and may resort to building alternative perspectives and critical thinking.
- Gained knowledge on the various social institutions governing gender and the intersectionality.
- Exposed to the kind of initiatives of the State towards gender equality

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PART-V GENDER STUDIES COURSE

**FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)**
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year	**PART-V**	**Semester-VI**
	பாலின சமத்துவம்	
Code:	**(Theory)**	**Credit: 2**

நோக்கம் :

- பாலின கட்டமைப்புகள் மற்றும் பாலினச்செயல்முறைகள் குறித்து மாணவர்களுக்கு விழிப்புணர்வு ஏற்படுத்துதல்
- சமூகத்தில் உள்ளடக்கிய தேவையைப் புரிந்து கொள்வதற்காக வெளியேறும் பாலின பிரச்சனைகள ஆராய்தல்
- பாலின சமத்துவ சமுதாயத்தை உருவாக்குவதற்கான உணர்திறனை உருவாக்குதல்
- பாலின நடுநிலை சூழலை உருவாக்கப் பாலின முன்னோக்கு, அணுகுமுறை, நடத்தை மாற்றங்கள் மற்றும் மனிதநேய மதிப்புகளை மேம்படுத்துதல்

அலகு -I   பாலினம் தொடர்பான கோட்பாடுகள்:

பாலினப்பார்வை -பால் - பாலின வித்தியாசம்   - உடற்கூறுரீதியாக நிர்ணயித்தல் - ஆணாதிக்கம் - பெண்ணியம் - பாலின சமூகமயமாக்கல் மற்றும் ஒருபடித்தானவைகள் - பாலின பாகுபாடு - பாலின வேலைப்பாகுபாடு மற்றும் பங்குகள் - பாலின உணர்வூட்டல் மற்றும் விழிப்புணர்வு- பாலின சமன்நிலை மற்றும் சமத்துவம் - பாலின மைய நீரோட்டமாக்கல் - பாலின பகுப்பாய்வு

அலகு -II   மகளிரியல் ஏள பாலின சமத்துவக்கல்வி:

மகளிரியல் - பாலினவியல் வரையரை- பல்கலைக்கழக மானியக்குழுவின் மகளிரியளுக்கான தலையீடுகள் மற்றும் வழிக்காட்டுதல்கள் - பெய்ஜிங் மாநாடு- ஐக்கிய நாடுகள் சபையின் தலையீடுகள் மற்றும் பெண்களுக்கு எதிரான அனைத்து பாகுபாடுகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை ___ நீடித்த நிலையான வளர்ச்சி இலக்குகளில் பாலின சமத்துவம் (SDG 5) மற்றும் இலக்குகள்

அலகு -III   பாலியல் பாகுபாட்டிற்கான தளங்கள் :

பாலின விகிதாச்சாரம் -___ ஆரோக்கியம் மற்றும் ஊட்டச்சத்து- கல்வியறிவு மற்றும் கல்வி ___ வேலைவாய்ப்பு- ஆளுகை- முடிவெடுத்தல்- அரசியல் -சொத்துரிமை - நிதியை கையாளுதலில் பங்கேற்றல்- பாலின ரீதியாக வன்முறைகள்- சமூக நிறுவனங்கள் - குடும்ப, சாதி, வர்கம், மதம், பாலினம், அரசு,சந்தை, ஊடகம்கள், மற்றும் நீதி துறை

அலகு -IV   பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு

Towards Equality Report of Status of Women in India 1974 - சர்வதேச பெண்களுக்கான தசாப்தம் - சர்வதேச பெண்கள் ஆண்டு ___ பெண்களை அதிகாரப்படுத்துதலுக்கான தேசிய கொள்கை 2001

அலகு-V   பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு வழிமுறைகள்

தேசிய மற்றும் மாநில மகளிர் ஆணையம் - அனைத்து மகளிர் காவல் நிலையங்கள் - குடும்ப நீதி மன்றங்கள் - மாற்றுப்பாலினத்தவர்களுக்கான கொள்கை- பெண்களின் அரசியல் பங்கேற்பிற்கான அரசியல் சாசன சட்டதிருத்தங்கள்

அலகு- VI   தற்போதைய வரையறைகள் - அகமதிப்பீட்டிற்கு மட்டும்:
(Current Contours - For Continuous Internal Assessment Only)

தமிழக அரசின் பெண்களுக்கான கொள்ளை 2021- பெண்களுக்கான தேசிய கொள்கை 2015 - பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான சட்டம் 2013 - பாலியல் குற்றங்களிலிருந்து பெண் குழந்தைகள் பாதுகாக்கும் சட்டம் 2012 ___
உயர் நீதி மன்ற மற்றும் உச்ச நீதி மன்ற தீர்ப்புகள், கொள்கைகள் திட்டங்கள் மற்றும் தலையீடுகளை பகுப்பாய்வு செய்தல்

REFERENCE :

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004

2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004

3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993

4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication ,2000

5. பாலியலை புரிந்து கொள்வோம், மதுரை :ஏக்தா,……….

6. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency ,2001

7. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003

8. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002

9. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999

10. அஜிதா, குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005, மதுரை : ஏக்தா 2005

11. பொன்.கிருஷ்ணசாமி,ஜே.பால் பாஸ்கர்&ஆ.ஜான் வின்சென்ட், பெண்களும் உச்ச நீதிமன்றமும், மதுரை :சோக்கோ வாசகர் வட்டம், 2004

12. குடும்ப வன்முறையிலிருந்து பெண்களை பாதுகாக்கும் சட்டம் 2005- கையேடு, திருச்சி: Women's Integrated National Development Trust

13. https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/

பாடநெறி முடிவுகள் மாணவர்கள் இந்த பாடத்தில் பயின்ற பிறகு:

- மாணவர்கள் சமூகத்தில் காணப்படுகின்ற பால் மற்றும் பாலின ரீதியான வித்தியாசங்களை புரிந்து கொள்வதோடு மாற்றுச்சிந்தனைகள் மற்றும் விமர்சன கண்ணோட்டங்களை பெற இயலும்.

- பாலின மற்றும் பாலின உட்கூறுகளை ஆளுகைக்கு உட்படுத்துகின்ற பல்வேறு சமூக நிறுவனங்களை பற்றிய அறிவை பெறுவார்கள்

- பாலின சமத்துவத்தை அடைவதற்கான அரசின் பல்வேறு தலையீடுகள் பற்றி அறிந்திருப்பார்கள்

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BHARATHIDASAN UNIVERSITY   TIRUCHIRAPPALLI - 620 024

PART-IV VALUE EDUCATION COURSE

**FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)**
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

First Year	**PART-IV**	**Semester-I**
	VALUE EDUCATION	
Code:	**(Theory)**	**Credit: 2**

OBJECTIVES:

* To understand the philosophy of life and values through Thirukural
* To analyse the components of values education to attain the sense of citizenship
* To understand different types of values towards National Integration and international understanding
* To learn yoga as value education to promote mental and emotional health
* To understand human rights, women rights and other rights to promote peace and harmony

UNIT I :   PHILOSOPHY OF LIFE AND SOCIAL VALUES:

Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

UNIT-II – HUMAN VALUES AND CITIZENSHIP

Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education- A P J Kalam's ten points for enlightened citizenship- The role of media in value building

UNIT-III VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT:

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith -Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.

UNIT IV : YOGA AND HEALTH:

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

UNIT V : HUMAN RIGHTS:

Concept of Human Rights: Indian and international perspectives- Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty ad Dignity- Right to equality- Right against exploitation- Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.

UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):

BOOKS FOR REFERENCES:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. திருக்குறள் - ஜி.யு.போப் - ஆங்கில மொழியாக்கத்துடன் உமா நூல், வெளியீட்டகம், தஞ்சாவூர்,
3. Leah Levin, Human Rights, NBT, 1998
4. V.R. Krishna Iyer, Dialetics and Dynamics of Human Rights in India, Tagore Law Lectures.
5. Yogic Thearpy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
6. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedaptti, 1999.
7. Grose. D. N – "A text book of Value Education' New Delhi (2005)
8. Gawande . EN – "Value Oriented Education" – Vision for better living. New Delhi (2002) Saruptsons
9. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

COURSE OUTCOMES: After completion of the course, the student will be able to:

- Apply the values in thirukural to be peaceful, dutiful and responsible in family and society
- Develop character formation and sense of citizenship
- Be secular, self-control, sincere, respectful and moral.
- Master yoga, asana and meditation to promote mental health
- Be attitudinal to follow the constitutional rights

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BHARATHIDASAN UNIVERSITY   **TIRUCHIRAPPALLI - 620 024**

PART-IV SOFT SKILLS DEVELOPMENT COURSE

FOR ALL UG ARTS, SCIENCE, COMMERCE AND MANAGEMENT
CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)
(Applicable to the candidates admitted from the academic year 2022-2023 onwards)

Third Year   **PART-IV**   **Semester-V**
                         SOFT SKILLS DEVELOPMENT
Code: **(Theory)**   **Credit: 2**

OBJECTIVES :

- To Develop communicative competence among the Students.
- To enhance the learner's soft skills by giving adequate exposure in LSRW and sub skills.
- To enable learners to put the life skills into practice with confidence.

UNIT- I   KNOW THYSELF / UNDERSTANDING SELF:

Introduction to Soft skills-Self discovery-Developing positive attitude-Improving perceptions- Forming values.

UNIT -II   INTERPERSONAL SKILLS/ UNDERSTANDING OTHERS:

Developing interpersonal relationship-Team building-group dynamics-Net working- Improved work relationship

UNIT -III   COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS:

Art of listening –Art of reading –Art of speaking –Art of writing-Art of writing e-mails e mail etiquette.

UNIT- IV   CORPORATE SKILLS / WORKING WITH OTHERS

Oral Presentation – Memos- Note taking - Note making   and preparing Minutes- Reports, Proposals, Abstracts - Technical Writing.

UNIT -V   SELLING SELF / JOB HUNTING

Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD – Goal setting - Career planning

UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):

REFERENCES:

1. N. Krishnasamy, Manju Dhariwel and Lalitha Krishnasamy(2015). Mastering Communication Skills and Soft Skills – Bloomburg.
2. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors,
3. Meera Banerjee and Krishna Mohan: Developing Communication Skills, Trinity Publishers-(Lakshmi Publications.
4. Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

COURSE OUTCOMES:

*   Develop listening, speaking, reading and writing skills in English.
*   Enhance soft skills and engage in a range of communicative tasks and activities
*   Comprehend a text and identify specific and global information
*   Promote communicative ability in both spoken and written form of the language
*   Develop interpersonal skills to maintain human relationship
*   Develop corporate skills to promote leadership qualities and team spirit.

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BHARATHIDASAN UNIVERSITY,   **TIRUCHIRAPPALLI - 620 024.**

ALLIED MATHEMATICS for

Allied Mathematics for B.Sc. Mathematics Programmes

(Applicable to the candidates admitted from the academic year 2022-23 onwards)

ALLIED COURSE I
MATHEMATICAL STATISTICS I

Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To learn the basic concepts of statistics
- To learn the basic ideas of statistical data

UNIT – I:

Statistical data – Primary data and Secondary data(definitions only), Formation of frequency distribution, various measures of central tendency – mean ,median, mode, geometric mean harmonic mean – simple problems – properties of above measures.

UNIT – II:

Measures of dispersion – Range quartile deviation mean deviation, standard deviation – their coefficients- merits and demerits (simple problems) – Skewness and kutosis Karlpearson's coefficients- Bowley's coefficients- simple problems.

UNIT – III:

Probability- Definition, axiomatic approach to probability - Additive and Multiplicative laws of Probability (two variables only) and Conditional probability – simple problems- Concept of random variables – discrete and continuous random variables - Distribution function, pmf and pdf and their properties- simple problems.

UNIT – IV:

Mathematical Expectation – addition and multiplication theorems (two variables only) – Moment generating and characteristics functions, their properties – Conditional expectation and conditional variance (simple problems).

UNIT – V:

Binomial and Poisson distributions – moments, moment generating function cumulant generating function (Simple problems)- fitting of binomial and poisson distribution.

UNIT – VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction to SPSS software

REFERENCES:

1. Gupta S.C. and Kapoor V.K., Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. S.P. Gupta , Statistical Methods (Revised edition 2001)
      UNIT – I : Chapter I, II Sec 2.1-2.9 of (1)
      UNIT – II   : Chapter III Sec 3.1-3.7, 3.13,3.14 of (1)
      UNIT – III   : Part – II Chapter 1 of (2)
      UNIT – IV   : Chapter VI Sec 6.1-6.4,6.9,6.10,6.12 of (1)
      UNIT – V   : Chapter VII Sec 7.1,7.3
3. Gupta S.C. and Kapoor V.K., Fundamentals of Applied Statistics, Sultan Chand & Sons.
4. R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013)

COURSE OUTCOMES:

After completing this course, the students will be able to

- Understand random variables and probability distributions.
- Know the difference between continuous and random variables.
- Acquire the knowledge by using Binomial and Poisson distribution.

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<div align="center">**ALLIED PRACTICAL**</div>
<div align="center">**MATHEMATICAL STATISTICS**</div>

Code: **(Practical)**   **Credit: 2**

<div align="center">25 marks for records and 75 marks for Practical Examination</div>
<div align="center">Passing minimum for Record – 10 marks (out of 25 marks)</div>
<div align="center">Practical Examination – 30 marks (out of 75 marks)</div>

COURSE OBJECTIVES:

- To train the students in solving statistical problems

UNIT – I:

Moments of central tendency- A.M, median, G.M and H.M- Measures of Dispersion- quartile deviation, standard deviation and co-efficient of variation measures of skewness - calculations of first four moments, Central moments, B_1, B_2.

UNIT – II:

Bivariate discrete probability distribution- marginal distribution and conditional distribution – Calculation of mean, variance, covariance, correlation coefficient, expectation - conditional expectations and conditional variance.

UNIT – III:

Fitting of binomial, poisson and normal distributions (area method only).

UNIT – IV:

Calculation of Karl pearson's coefficient of correlation, Spearman's rank correlation and regression equations.

UNIT – V:

Large sample tests- Test of single mean- Difference between means – single proposion and Difference between proposion. Exact simple test- t' test for single mean, Difference between means, paired t - test - chi square test for goodness of fit and independence of attributes.

UNIT – VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction to R package

REFERENCES:

1.   R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013).
         UNIT – I : Chapter 3, 4 & 5
         UNIT – II   : Chapter 12
         UNIT – III   : Chapter 13

UNIT – IV   : Chapter 6 & 7
UNIT – V   : Chapter 14 & 15

2.   Gupta S.C. and Kapoor V.K., Fundamentals of Mathematical Statistics, Sultan Chand & Sons.

3.   S.P. Gupta, Statistical Methods (Revised edition 2001).

COURSE OUTCOMES:

After completing this course, the students will be able to

- Understand and critically discuss the issues surrounding sampling and significance.
- Check the given data are correlated or not using Karl Pearson's coefficient of correlation or Spearman's rank correlation.

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Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

* To learn the basic concepts of Discrete continuous distributions
* To learn the test of significance

UNIT – I:

Normal distribution – derivation of normal from binomial – chief characteristics – M.G.F & C.G.F of normal distributions – Moments of normal distributions – area property – fitting of normal distributions.

UNIT – II:

Continuous distributions – Rectangular, Gamma, Beta, exponential – distributions - sampling distributions, 't' , 'F' and Chi-square distributions.

UNIT – III:

Correlation – Rank correlation, Karl Pearson's correlation co-efficient and its properties. Linear regression and its properties, concept of multiple and partial correlation for three variables only.

UNIT – IV:

Test of significance – Definition of null hypothesis, alternative hypothesis, sampling distribution, standard error and critical region. Type I and Type II errors, one tailed and two tailed tests. Large sample test for single mean, Difference between means, single proportion and difference between proportions.

UNIT – V:

Small sample tests – 't' test for single mean. Difference between means. Paired 't' test, Chi- square test for goodness of fit and independence of attributes.

UNIT – VI   CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction to Data science.

REFERENCES:

1. Gupta S.C. and Kapoor V.K., Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013).
3. S.P. Gupta, Statistical Methods (Revised edition 2001).

COURSE OUTCOME:

After completing this course, the students will be able to

- Understand the meaning of correlation, regression and its properties.
- Apply the concepts of t, F, z distributions and its applications.
- Apply the concepts of sampling techniques and procedure of testing of hypothesis for large samples.

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BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI - 620 024.

ALLIED COMPUTER SCIENCE FOR B.Sc. PROGRAMMES

(For the candidates admitted from the academic year 2022-23 onwards)

ALLIED COURSE I
PROGRAMMING IN C
Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To express algorithms and draw flowcharts in a language independent manner.
- To teach how to write modular, efficient and readable C programs
- To impart knowledge in creating and using Arrays of the C data types.

UNIT - I:

Algorithms – Flow charts – Developing algorithms and flowcharts for solving simple problems using sequential, selection and iterative programming Structures.

UNIT - II:

History of C and its importance – Structure of a C program – Data Types – Constants and Variables – Operators and Expressions – Control structures – Looping structures.

UNIT - III:

Arrays – Character Arrays and Strings – User defined functions.

UNIT - IV:

Pointers: Introduction – Pointer Expressions – Chain of Pointers –Pointers and Arrays – Array of Pointers – Pointers as function arguments – Functions returning Pointers – Pointers to Functions – Function pointer – Pointers and Structures

UNIT - V:

Structures: Introduction – Defining a structure – Declaration of structure – Accessing Structures members – Array of Structures – Structures within structures – Structures and functions – Structures and Pointers – Union. Files: Opening and closing files – Operations on files.

UNIT – VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. S. Jaiswal, "Information Technology Today", Galgotia Publications, New Delhi, Fourth Edition, 2009.
2. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, New Delhi, Seventh Edition, 2016.
3. E.Horowitz, S.Sahni and Susan Anderson Freed, "Fundamental Data Structures in C", 2ed, Orient BlackSwan Publisher, 2009.
4. Byron S. Gottfried, "Programming with C", Schaum's Outline Series, Tata-McGraw Hill Edition, New Delhi, 1991.
5. E. Karthikeyan, "A Textbook on C Fundamentals, Data Structures and Problem Solving",Prentice-Hall of India Private Limited, New Delhi, 2008.
6. YashavantKanetkar, "Let us C", BPB Publications, Tenth Edition, New Delhi, 2010.
7. Szuhay, Jeff, and Szuhay, Jeff, "Learn C Programming: A Beginner's Guide to Learning C Programming the Easy and Disciplined Way", Packt Publishing, 2020.
8. Jena, Sisir Kumar, and Jena, Sisir Kumar, "C Programming: Learn to Code", CRC Press, 2021.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

• Recall algorithms and flowcharts for computing logic
• Summarize the basic knowledge to develop C programs
• Apply and implement programs for solving real world problems
• Examine and explore the use of memory allocation for application programs
• Design and develop alternate methods of solving variety of problems

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ALLIED PRACTICAL I
PROGRAMMING IN C LAB

Code: (Theory)   Credit: 2

COURSE OBJECTIVES:

* To introduce students to the basic knowledge of programming fundamentals of C language.
* To impart writing skill of C programming to the students and solving problems.
* To impart the concepts like looping, array, functions, pointers, file, structure.

1. Write a Program to convert temperature from degree Centigrade to Fahrenheit.
2. Write a Program to find whether the given number is Even or Odd.
3. Write a Program to find the greatest of Three numbers.
4. Write a Program to use the switch statement to display Monday to Sunday.
5. Write a Program to display first Ten Natural Numbers and their sum.
6. Write a Program to find Multiplication of Two Matrices.
7. Write a Program to find the maximum number in Array using pointer.
8. Write a Program to reverse a number using pointer.
9. Write a Program to solve Quadratic Equation using functions.
10. Write a Program to find factorial of a number using Recursion.
11. Write a Program to show Call by Value and Call by Reference.
12. Write a Program to add two numbers using pointer.
13. Write a Program to create a file containing Student Details.
14. Write a Program to update the details of student's information using various file modes.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

* Relate the ways to solve simple programs
* Understand and trace the execution of programs using arrays
* Develop programs with functions and pointers
* Compare and contrast structures and unions
* Solve data handling problems using files

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PRINCIPLES OF INFORMATION TECHNOLOGY

Code: **(Theory)**   **Credit: 4**

COURSE OBJECTIVES:

- To Provide the Basic Concepts in Information Technology
- To adapt to emerging technologies used in the global marketplace.
- To implement personal and interpersonal skills

UNIT - I:

Introduction to Computer – Classification of Digital Computer System – Computer Architecture – Memory Units – Auxiliary Storage Devices – Input and Output Devices.

UNIT - II:

Introduction to Computer Software – Operating System – Programming Languages – General Software Features and trends.

UNIT - III:

Database Management Systems – Data Processing – Introduction to Database Management System – database design.

UNIT - IV:

Introduction to Telecommunication – Networking – Communication System – Distributed System – Internet – Intranet.

UNIT - V:

Multimedia tools – Virtual Reality – E-Commerce – Data warehousing – Data Mining – Applications; Geographical Information System – Computer in Business, Industry, Home, Education and Training.

UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Fundamentals of Information Technology, Alexis Leon And Mathews Leon, Vikas Publishing House Pvt. Ltd, 2009
2. Henry C.Lucas, Jr., Information Technology for Management – McGraw Hill (Part – III).c,1999
3. Williams, Sawyer, Hutchinson, Using Information Technology – McGraw Hill.1999

4. Stephen Doyle, "Understanding Information Technology", Stanley Thornes, 2000
5. Kathleen M. Austin, Lorraine N. Bergkvist, "Principles of Information Technology", Good heart-Willcox Company, 2015
6. V. Rajaraman, "Introduction To Information Technology", PHI Learning Pvt. Ltd, 2018

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Explore careers in information technology
- Work with the Internet and other technologies for information exchange
- Handle online security and privacy issues
- Analyze the different types of application software, such as word processing, desktop publishing, spreadsheet, and presentation software
- construct the basics of database technology

PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES-I

OBJECTIVES:

- To develop the language skills of students by offering adequate practice in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
- To focus on developing students' knowledge of domain specific registers and the required language skills.
- To develop strategic competence that will help in efficient communication
- To sharpen students' critical thinking skills and make students culturally aware of the target situation.

LEARNING OUTCOMES:

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

  (Outcomes based on guidelines in UGC LOCF – Generic Elective)

UNIT 1: COMMUNICATION

1. **Listening**: Listening to instructions

2. **Speaking**: Telephone etiquette and Official phone conversations

3. **Reading** short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)

5. **Writing:** Letters and Emails in professional context

6. **Grammar in Context:**
   - Wh and yes or no,
   - Q tags
   - Imperatives
7, **Vocabulary in Context:** Word formation - .
   - i)   Creating antonyms using Prefixes
   - ii)   Intensifying prefixes (E. g inflammable)

Changing words using suffixes

A) Noun Endings
B) Adjective Endings
C) Verb Endings

UNIT 2: DESCRIPTION

Listening – Listening to process description

Speaking - Role play
Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication

Reading –Reading passages on products, equipment and gadgets

Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena

Grammar **in Context**: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

UNIT 3: NEGOTIATION STRATEGIES

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject-specific)

Reading – longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)

Grammar in Context: Active voice & Passive voice – If conditional - Collocations –Phrasal verbs

UNIT 4: PRESENTATION SKILLS

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech
- Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.

Writing - Writing Recommendations
Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

UNIT 5: CRITICAL THINKING SKILLS

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions
_____

SUGGESTED ACTIVITIES

UNIT 1

Listening: Links for formal conversation can be given - Gap filling exercises – Multiple Choice questions – Making notes.

Speaking - Role play activity

Reading – Note making. Note-Taking.

Writing: Guided Writing (developing hints)

       Email

Grammar: Vocabulary – Worksheets – Games.

UNIT 2

Listening-
Process Descriptions (Processes of Condensation and Evaporation./Process of Measuring   the thickness of a wire using a Screw -Gauge./process of Exaction of sugar from sugarcane)

Speaking – Role Play

Reading – Multiple choice questions - Evaluative answers – Classifying and labeling

Writing - Picture description – Description of natural phenomena (rainbow, earthquake, volcanic eruption, erosion, natural disasters in 150 to 200 words).

Vocabulary: Expansion of compound nouns

UNIT 3
Listening- Gap fill exercises – Listening comprehension

Speaking -Debates

Reading -Reading comprehension

Writing – Essay Writing

Grammar - Vocabulary, Activities, Worksheets & Games.

UNIT 4

Listening - Note taking (of listening & viewing items) - Filling a table based on the listening item.

Speaking – JAM, Presentations. (PPT-TECHNICAL)

Reading-Reading comprehension

Writing– Difference between recommendations and instructions

Questions/MCQs based on graphs/flow diagrams/charts

Grammar: Vocabulary – Activities, Worksheets & Games.

UNIT 5

Listening – Radio News/ TV-News telecast /

Speaking - Watch or listen to documentaries and ask questions

Reading - Reading motivational stories (success stories in subject area)

Writing - Essay writing.

Grammar -Vocabulary –Activities, Worksheets & Games

<h1 style="text-align: center">Professional English-Semester-II [part-III -add on Course]</h1>

Weightage: 4 Credits   **Duration: 90hrs**

Objectives:

The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges

- Develop their competence in the use of English with particular reference to the workplace situation.

- Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.

- Develop their competence and competitiveness and thereby improve their employability skills.

- Help students with a research bent of mind develop their skills in writing reports and research proposals.

Unit 1- Communicative Competence   **(18 hrs)**

Listening – Listening to two talks/lectures by specialists on selected subject specific topics -(TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages.

Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

Unit 2 - Persuasive Communication   **(18 hrs)**

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

Unit 3- Digital Competence   (18 hrs)

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (usingvideo conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging tonurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

Unit 4 - Creativity and Imagination   (18 hrs)

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. https://www.youtube.com/watch?v=tpvicScuDyo)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating blogs, flyers and brochures (subject based)
- Poster making – writing slogans/captions(subject based)

Unit 5- Workplace Communication& Basics of Academic Writing (18 hrs)

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing

Punctuation(period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case)

Outcomes of the Course.

At the end of the course, learners will be able to,

• Attend interviews with boldness and confidence.

- • Adapt easily into the workplace context, having become communicatively competent.

- • Apply to the Research &Development organisations/ sections in companies and offices with winning proposals.

Instruction to Course Writers:

1. **Acquisition of subject-related vocabulary should not be overlooked**. Textboxes with relevant vocabulary may be strategically placed as a Pre Task or in Summing Up
2. Grammar may be included if the text lends itself to the teaching of a Grammatical item. However, testing and evaluation does not include Grammar.