

## **B.sc.Mathematics Degree Program**

### **Eligibility:**

- **Candidates for admission to the first year programme leading to the Degree of B.sc.Mathematics will be required to possess.**
- **Pass with 50% of Marks in HSC. In case of SC/ST candidate, merely pass with 40% of Marks in HSC will be sufficient.**

### **Aim:**

**This Programme is a high quality degree program that ensures that students will be able to integrate theory and practice ,recognize the importance of abstraction an appreciate the value of efficient design created to meet clearly developed requirements**

### **Program Educational Objectives:**

- 1. PEO1 - Graduates will develop the skill to write entrance exam conducted by IIT's/Universities to pursue PG and Integrated Ph.D and will shine as great Mathematicians**
- 2. PEO2 - Graduates to develop confidence to appear for SSC (CGL), IBPS, RRB and Civil services exam and will occupy higher posts in administrative level.**
- 3. PEO3 - Graduates will prepare in advance to appear for TRB after completing B.Ed and become a dedicated faculty.**
- 4. PEO4 - Graduates develop teaching skills, Subject knowledge in the course of their study which will help them to shine in various fields including Education, IT, etc.**
- 5. PEO5 - Graduates will use their course as a training ground to develop their positive attitude, skills which will enable them to become a multi facet personality shining in any chosen field.**

### **Programme Outcomes (POs):**

- 1. Graduates are prepared to be creators of new knowledge leading to innovation and entrepreneurship employable in various sectors such as private, government, and research organizations.**
- 2. Graduates are trained to evolve new technologies in their own discipline.**
- 3. Graduates are groomed to engage in lifelong learning process by exploring their knowledge independently.**
- 4. Graduates are framed to design and conduct experiments /demos/create models to analyze and interpret data.**
- 5. Graduates ought to have the ability of effectively communicating the findings of Biological sciences incorporating with existing knowledge.**

### **Programme Specific Outcomes (PSOs):**

- 1. Analytic skills and Critical thinking.**
- 2. Computational and Data Analysis skills.**
- 3. Aptitude skills that will help to take up research in pure and applied mathematics.**
- 4. Reasoning skills required to learn advance mathematics.**
- 5. Probing attitude and a search for deeper knowledge in science.**
- 6. The relevance and applications of Mathematics in scientific phenomenon.**
- 7. Positive approach towards Higher Education in Mathematics.**
- 8. Employability Skills that will enable the students to explore career in Teaching and Research in Mathematics.**

**NATIONAL COLLEGE (Autonomous), TIRUCHIRAPPALLI-1**

**B.Sc. Mathematics-Course structure under CBCS pattern**

**(For the candidates to be admitted from the year 2019 onwards)**

SEMESTER	Course Title	Instruction hours /week	Credit	Exam hours	Marks		Total
					Internal	External	
I	Language Course-1 (Tamil-1/Hindi-1/Sanskrit-1)	6	3	3	25	75	100
	English Language Course-1	6	3	3	25	75	100
	Differential Calculus and Trigonometry	5	5	3	25	75	100
	Integral Calculus and Fourier series	3	-	*	-	-	-
	Allied Physics-1	5	3	3	25	75	100
	Allied Physics-2 Practical	3	-	*	-	-	-
	Environmental Studies	2	2	3	25	75	100
II	Language Course-2 (Tamil-2/Hindi-/Sanskrit-2)	6	3	3	25	75	100
	English Language Course-2	4	2	3	25	75	100
	Communicative English Course-1	2	1	3	25	75	100
	Integral Calculus and Fourier series	3	6	3	25	75	100
	Analytical Geometry(3D) &Vector Calculus	5	5	3	25	75	100
	Allied Physics-2 Practical	3	3	3	25	75	100
	Allied Physics-3	5	3	3	25	75	100
SKILL BASED ELECTIVE:1	2	2	3	25	75	100	
III	Language Course-3 (Tamil-3/Hindi-3/Sanskrit-3)	6	3	3	25	75	100
	English Language Course-3	6	3	3	25	75	100
	Differential Equations	4	4	3	25	75	100
	Classical Algebra	3	-	*	-	-	-
	Mathematical Statistics-	4	3	3	25	75	100
	Mathematical Statistics -2 Practical	3	-	*	-	-	-
	Desktop Publishing	2	2	3	25	75	100
Office Automation &Desktop Publishing	2	2	3	25	75	100	

IV	Language Course-4 (Tamil-4/Hindi-4/Sanskrit-4)	6	3	3	25	75	100
	English Language Course -4	4	2	3	25	75	100
	Communicative English Course-2	2	1	3	25	75	100
	Classical Algebra	3	5	3	25	75	100
	Sequence and Series	4	4	3	25	75	100
	Mathematical Statistics -2 Practical	3	3	3	25	75	100
	Mathematical Statistics -3	5	3	3	25	75	100
	Value Education	1	2	3	25	75	100
	Non major Elective-1	2	2	3	25	75	100
V	Abstract Algebra	5	5	3	25	75	100
	Real Analysis	5	5	3	25	75	100
	Statics	6	5	3	25	75	100
	Operation Research (Or) Automata Theory	5	4	3	25	75	100
	Astronomy (OR) Discrete Mathematics	5	4	3	25	75	100
	Non Major Elective -2	2	2	3	25	75	100
	Soft-Skills	2	2	3	25	75	100
VI	Theory of Transforms	6	6	3	25	75	100
	Complex Analysis	6	6	3	25	75	100
	Dynamics	6	6	3	25	75	100
	Numerical Methods	6	6	3	25	75	100
	Graph theory(Or) Stochastic Process	5	4	3	25	75	100
	Gender Studies	1	1	3	25	75	100
	Extra-Curricular Activity	-	1	-	-	-	-

தேசியக்கல்லூரி (தன்னாட்சி), திருச்சிராப்பள்ளி - 620 001.  
தமிழாய்வுத்துறை

இளநிலை - தமிழ் - முதற் பருவம்  
தாள்: மொழிப்பாடம்-1 செய்யுள் (கவிதை), உரைநடை, சிறுகதை,  
இலக்கிய வரலாறு, இலக்கணம்

U19T1

கற்பிக்கும் காலம்: 6 மணி  
கற்பித்தலின் நோக்கங்கள்

தரப்புள்ளிகள்: 3

1. இக்கால மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, உரைநடைக்கட்டுரைகளை அறிமுகம் செய்தல்.
2. நாட்டுப்புறப்பாடல்களைப் புலப்படுத்துதல்.
3. எழுத்துக்களின் வேறுபாட்டால் பொருள் மாறுபடலை எடுத்துரைத்தல்.

அலகு - 1: மரபுக்கவிதை

பாரதியார்	- கண்ணன் என் சேவகன், கண்ணன் என் விளையாட்டுப் பிள்ளை.
பாரதிதாசன்	- அழகின் சிரிப்பு
கவிமணி	- வாழ்க்கைத் தத்துவங்கள், இயற்கை வாழ்வு
பட்டுக்கோட்டையார்	- படிப்பும் உழைப்பும், நேர்மை வளையுது
நாமக்கல்லார்	- படிப்பினை
கண்ணதாசன்	- காலக்கணிதம், ஒரு கந்தல் துணியின் கதை
சுரதா	- நீர்

அலகு - 2: புதுக்கவிதை, நாட்டுப்புறப்பாடல்கள்,

வாலி	- ஒரு கௌதமன் வாரானோ!, புன்னகை மன்னன்
மு.மேத்தா	- ஒரு கிராமத்தின் கதையல்ல
அப்துல் ரகுமான்	- சிறகுகள், சுயப்பிரசவம்
ஈரோடு தமிழன்பன்	- மின்மினிக்காடு
அறிவுச்செல்வன்	- நமக்குத் தொழில் மனிதம்
விக்ரமாதியன்	- நிகழ்வுகள்
பொன்மணி வைரமுத்து	- வாழ்க்கை தொடங்குகிறது

நாட்டுப்புறப் பாடல்கள்:

- (1) தாலாட்டு
- (2) கும்மிப்பாடல்
- (3) வேளாண்மை

அலகு - 3: உரைநடைக் கட்டுரைகள்

1. டிங்கினானே - உ.வே.சாமிநாத ஐயர்
2. கடற்கரையிலே - சிதம்பரனார் - ரா.பி.சேதுப்பிள்ளை
3. கம்பரும் நாடகப் பண்பும் - ரசிகமணி டி.கே.சிதம்பரநாத முதலியார்
4. முடத்தெங்கு - கி.ஆ.பெ. விசுவநாதம்
5. இராமன் எத்தனை இராமனடி - முனைவர் சோ.சத்தியசீலன்
6. உரைநடையின் அணிநலன்கள் - முனைவர் மா.இராமலிங்கம்
7. திருவள்ளுவர் குறிப்பிடும் மென்திறன்கள் - முனைவர் ம.திருமலை

#### அலகு - 4: சிறுகதைகள்

- |                  |                        |
|------------------|------------------------|
| 1. கவர்னர் வண்டி | - கல்கி                |
| 2. நினைவுப்பாதை  | - புதுமைப்பித்தன்      |
| 3. சோற்றுச்சுமை  | - ஜெயகாந்தன்           |
| 4. முள்முடி      | - தி.ஜானகிராமன்        |
| 5. காற்று        | - கு.அழகிரிசாமி        |
| 6. ஆயுள்         | - பிரபஞ்சன்            |
| 7. அசலும் நகலும் | - இந்திரா பார்த்தசாரதி |
| 8. மாத்திரை      | - ஆண்டாள் பிரியதர்ினி  |

#### அலகு - 5: இலக்கிய வரலாறு, இலக்கணம்

இலக்கிய வரலாறு. (மரபுக்கவிதை, புதுக்கவிதை, உரைநடை, சிறுகதை மட்டும்) - மயங்கொலிச்சொற்கள், ல,ள,ழ, ர,ற, ன,ண,ந வேறுபாடுகளால் பொருள் மாறுபடுதல்.

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

#### பாடநூல்

1. தமிழ் - முதற் பருவம் - தேசியக்கல்லூரி வெளியீடு.
2. இலக்கிய வரலாறு - தேசியக்கல்லூரி வெளியீடு.

#### கற்பித்தலின் பயன்கள்

1. இக்காலத் தமிழை உணர்வர்.
2. கவிதை, சிறுகதை படைக்கும் ஆற்றல்களை வளர்த்துக் கொள்வர்.
3. இலக்கணப் பிழையின்றி எழுத முயற்சிப்பர்.

தேசியக்கல்லூரி (தன்னாட்சி), திருச்சிராப்பள்ளி - 620 001.  
தமிழாய்வுத்துறை  
இளநிலை - தமிழ் - இரண்டாம் பருவம்  
தாள்: மொழிப்பாடம்-2 செய்யுள் (பக்தி இலக்கியம்), புதினம்,  
இலக்கிய வரலாறு

U19T2

கற்பிக்கும் காலம்: 6 மணி  
கற்பித்தலின் நோக்கங்கள்

தரப்புள்ளிகள்: 3

1. பல்வேறு சமய நெறிமுறைகளை உணர்த்துதல்.
2. பக்தி இலக்கிய மாண்பினைப் புலப்படுத்துதல்.
3. புதின இலக்கிய வகையை அறிமுகம் செய்தல்.

அலகு - 1: சைவ இலக்கியம்

திருஞானசம்பந்தர் - திருச்சிராப்பள்ளி - நன்றுடையானை தீயதிலானை.  
திருநாவுக்கரசர் - தில்லைப் பெருங்கோயில் - கருநட்ட கண்டனை.  
சுந்தரர் - திருமழபாடி - பொன்னார் மேனியனே  
மாணிக்கவாசகர் - திருச்சாழல் - பூசுவதும் வெண்ணீறு.

அலகு - 2: வைணவ இலக்கியம்

திருப்பாணாழ்வார் - அமலனாதிபிரான் - அமலனாதிபிரான் அடியார்க்கு  
தொண்டரடிப்பொடியாழ்வார் - திருமாலை - பச்சைமாமலை போல் மேனி  
ஆண்டாள் - நாச்சியார் திருமொழி - வாரணம் ஆயிரம் சூழ  
நம்மாழ்வார் - திருவாய்மொழி - உயர்வற உயர்நலம்

அலகு - 3: பிற சமய இலக்கியங்கள்

சமண சமயப் பாடல்கள் - 10  
பௌத்த சமயப் பாடல்கள் - 10  
காசீம் புலவர் - முனாஜாத்துப் பதிகம் -10  
ஹெச்.ஏ.கிருஷ்ணபிள்ளை - இரட்சணிய மனோகரம் தோத்திரப்பதிகம் - 10

அலகு - 4: புதினம்

துளசிமாடம் - நா.பார்த்தசாரதி.

அலகு - 5: இலக்கிய வரலாறு, இலக்கணம்

இலக்கிய வரலாறு (சைவம், வைணவம், சமணம், பௌத்தம், இசுலாம், கிறித்தவம்  
மற்றும் புதினம் பற்றியன மட்டும்), வல்லினம் மிகும் இடங்கள், வல்லினம் மிகா இடங்கள்.

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

பாடநூல்

1. தமிழ் - இரண்டாம் பருவம் - தேசியக்கல்லூரி வெளியீடு.
2. இலக்கிய வரலாறு - தேசியக்கல்லூரி வெளியீடு.
3. புதினம் - துளசிமாடம் - நா.பார்த்தசாரதி - தேசியக்கல்லூரி வெளியீடு.

கற்பித்தலின் பயன்கள்

1. வேறுபட்ட சமய வழக்காறுகளை அறிவர்.
2. பிற சமயத்தார்களிடம் அன்பு பாராட்டுவர்.
3. புனைகதை வடிவங்களில் புதினம் பற்றி அறிவர்.

தேசியக்கல்லூரி (தன்னாட்சி), திருச்சிராப்பள்ளி - 620 001.  
தமிழாய்வுத்துறை

இளநிலை - தமிழ் - மூன்றாம் பருவம்  
தாள்: மொழிப்பாடம்-3 செய்யுள் (காப்பியம்), நாடகம்,  
இலக்கிய வரலாறு, பொதுக்கட்டுரை

U19T3

கற்பிக்கும் காலம்: 6 மணி

தரப்புள்ளிகள்: 3

கற்பித்தலின் நோக்கங்கள்

1. காப்பிய இலக்கியத்தின் செழுமையை உணர்த்துதல்.
2. காப்பியங்களின் உட்பொருளையும் கவியழகையும் புகட்டுதல்.
3. நாடகத்தின் மேன்மையை உணரச் செய்தல்.

அலகு - 1:

சிலப்பதிகாரம் - அடைக்கலக்காதை  
மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை.

அலகு - 2:

கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்  
பெரியபுராணம் - மெய்ப்பொருள் நாயனார் புராணம்

அலகு - 3:

தேம்பாவணி - வளன் சனித்த படலம்  
சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்.

அலகு - 4:

நாடகங்கள்:  
1. விசுவநாதன் அல்லது கடமை முரண்.  
2. மௌனதேசிகர் - பண்டித ம.கோபாலகிருணய்யர்

அலகு - 5:

இலக்கிய வரலாறு (காப்பியம், புராணம், நாடகம் பற்றியன மட்டும்),  
பொதுக்கட்டுரை.

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

பாடநூல்கள்

1. தமிழ் - மூன்றாம் பருவம், தேசியக்கல்லூரி வெளியீடு.
2. இலக்கிய வரலாறு - தேசியக்கல்லூரி வெளியீடு.
3. நாடகங்கள் - தேசியக்கல்லூரி வெளியீடு.

கற்பித்தலின் பயன்கள்

1. தமிழ்க் காப்பியப் பரப்பினை அறிவர்.
2. காப்பியங்களின் வழிநின்று புதிய முறையில் கற்பனையாற்றலைப் பெறுவர்.
3. நாடகத்தை உருவாக்கவும் நடிக்கவும் பழகுவர்.



தேசியக்கல்லூரி (தன்னாட்சி), திருச்சிராப்பள்ளி - 620 001.

தமிழாய்வுத்துறை

இளநிலை - தமிழ் - நான்காம் பருவம்  
தாள்: மொழிப்பாடம் - 4 : செய்யுள் (பண்டைய இலக்கியம்),  
இலக்கிய வரலாறு, மொழிபெயர்ப்பு

U19T4

கற்பிக்கும் காலம்: 6 மணி

தரப்புள்ளிகள்: 3

கற்பித்தலின் நோக்கங்கள்

1. அக, புற இலக்கியங்கள் பற்றி விளக்குதல்.
2. சங்கப் புலவர்களின் புலமைச், சிறப்பை எடுத்துரைத்தல்.
3. சங்ககால மக்களின் இல்லற மாண்பினை உணர்த்துதல்.

அலகு - 1:

நற்றிணை (5 பாடல்கள் - 242, 333, 353, 375, 380)

1. இலையில் பிடவம் ஈர்மலர் அரும்பப் - விழிக்கட் பேதைப் பெருங்கண்ணனார் - முல்லை.
2. மழைதொழில் உலந்து மாவிகம்பு கந்தெனக் - கள்ளிக்குடி பூதம் புல்லனார் - பாலை
3. ஆளில் பெண்டிர் தாளின் செய்த - கபிலர் - குறிஞ்சி.
4. நீடுசினைப் புன்னை நறுந்தாது உதிரக் - பொதும்பில் கிழார் - நெய்தல்.
5. நெய்யும் குய்யும் ஆடி மையொடு - கடலூர்ப் பல்கண்ணனார் - மருதம்.

குறுந்தொகை - (5 பாடல்கள் - 3, 27, 38, 135, 186)

1. நிலத்தினும் பெரிதே வானினும் உயர்ந்தன்று - தேவகுலத்தார் - குறிஞ்சி
2. கன்றும் உண்ணாது கலத்தினும் படாது - வெள்ளிவீதியர் - பாலை
3. கான மஞ்சை அறையின் முட்டை - கபிலர் - குறிஞ்சி
4. வினையே ஆடவர்க்குயிரே வானுதல் - பாலை பாடிய பெருங்கடுங்கோ - பாலை
5. ஆர்கலி ஏற்றொடு கார்தலை மணந்த - ஒக்கூர் மாசாத்தியார் - முல்லை

அலகு - 2:

அகநானூறு - (3 பாடல்கள் - 40, 48, 53)

1. கானல் மாலைக் கழிப்பூக் கூம்ப - குன்றியனார் - நெய்தல்
2. அன்னாய்! வாழி! வேண்டு அன்னை! நின்மகள் - தங்கால் முடக்கொற்றனார் - குறிஞ்சி
3. அறியாய், வாழி, தோழி! இருள்அற - சீத்தலைச்சாத்தனார் - பாலை

கலித்தொகை - 2 பாடல்கள்

1. எறிதரு கதிர் தாங்கி ஏந்திய குடை நிழல் - பாலைக்கலி : 8
2. முறம் செவி மறைப் பாய்பு முரண் செய்த புலி செற்று - குறிஞ்சிக்கலி : 16

அலகு - 3:

புறநானூறு (5 பாடல்கள் - 9, 45, 74, 101, 112,)

1. ஆவும் ஆனியற் பார்ப்பன மாக்களும் - நெட்டிமையார்
2. இரும்பனை வெண்தோடு மலைந்தோன் அல்லன் - கோவூர்க்கிழார்
3. குழவி இறப்பினும் ஊன்தடி பிறப்பினும் - சேரன் கணைக்காலிரும்பொறை
4. ஒருநாள் செல்லலம் இருநாள் செல்லலம் - ஓளவையார்
5. அற்றைத் திங்கள் அவ்வெண் நிலவில் - பாரி மகளிர்

திருக்குறள் - 3 அதிகாரங்கள் - 1. கல்வி, 2. ஈகை, 3. அன்புடைமை.

நாலடியார் (5 பாடல்கள் - 8, 19, 21, 36, 65)

1. செல்வம் நிலையாமை - செல்வர்யாம் என்றுதாம் செல்வுழி எண்ணாத
2. இளமை நிலையாமை - மற்றறிவாம் நல்வினை யாம்இளையம் என்னாது
3. யாக்கை நிலையாமை - மலைமிசைத் தோன்றும் மதியம்போல் யானை
4. அறன் வலியுறுத்தல் - இன்றுகொல் அன்றுகொல் என்றுகொல் என்னாது
5. சினமின்மை - இளையான் அடக்கம் அடக்கம் கிளைபொருள்

அலகு - 4:

நெடுநல்வாடை (முழுவதும்).

அலகு - 5:

இலக்கிய வரலாறு - எட்டுத்தொகை, பத்துப்பாட்டு நூல்கள், பதினெண் கீழ்க்கணக்கு நூல்கள், மொழிபெயர்ப்பு.

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

பகுதி 'அ, ஆ'வில் இலக்கிய வரலாறும், பகுதி 'இ'யில் 5-வது வினா மொழிபெயர்ப்புப் பகுதியினைத் தந்து எழுதக் கூறுதல் வேண்டும்.

(வினாத்தாளில் பகுதி 'இ'யில் கட்டாயம் மொழிபெயர்ப்புப் பகுதி இடம்பெறல் வேண்டும்.)

பகுதி அ -  $20 \times 1 = 20$

பகுதி ஆ -  $5 - 5 \times 5 = 25$

பகுதி இ -  $5 - 3 \times 10 = 30$  (5-ஆவது வினாவில் மொழிபெயர்ப்புப்பகுதி வினாவாகக் கேட்கப்பெறல் வேண்டும்.)

பாடநூல்

1. தமிழ் - நான்காம் பருவம் - தேசியக்கல்லூரி வெளியீடு.
2. இலக்கிய வரலாறு - தேசியக்கல்லூரி வெளியீடு.

கற்பித்தலின் பயன்கள்

1. ஐவகை நில அமைப்புகளைப் பற்றிய அறிவினைப் பெறுவர்.
2. சங்க கால மக்களின் வாழ்வியல் பற்றி அறிவர்.
3. மன்னர்களின் ஆட்சிச்சிறப்பு, கொடைச்சிறப்பு, வீரம் பற்றி உணர்வர்.

**COURSE OBJECTIVES**

The Learner will be able to

- a. communicate effectively and appropriately in real life situation;
- b. use English effectively for study purpose across the curriculum;
- c. develop interest in and appreciation of Literature;
- d. develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;
- e. revise and reinforce structure already learnt.

**UNIT I:**

1. At the College
2. On the Campus
3. Outside the Class
4. At the Post office
5. For Business and Pleasure
6. Review

**UNIT II:**

7. Are you Smart ?
8. Are You Creative?
9. Is it too hard to improve?
10. How to win ?
11. View Points
12. Snakes and Ladders
13. Yourself

**UNIT III:**

1. Birbal story- The loyal gardener
2. Hindu mythological story- The origin of coconut tree
3. A chinese story: The generous student
4. An African Story ; The Three Runners

**UNIT IV:**

5. The Golden place
6. The one – hundredth prince
7. The mouse Merchant

**UNIT V:**

8. When wishes come true – Rabindranath Tagore
9. The World and after
10. Julius Caesar

**Text Books:** 1. A Collection of Short stories, Department of English, National College, Trichy.  
2. Creative English for Communication (2nd edition) by Krishnasamy and Sriraman. Published by Macmillan

**Course objectives:**

**The learner will be able to**

1. develop interest in and appreciation of Literature;
2. develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;
3. integrate the skill of Reading a variety of texts.
4. use English effectively for study purpose across the curriculum

**UNIT I**

Excitement : Mack R. Douglas

Tight Corners : E.V. Lucas

**UNIT II**

Water – The Elixir of Life : C.V. Raman

Tree Speaks : C. Rajagopalachari

**UNIT III**

The Art of Telling Tales : April Hersey

A Job Well Done : Ruskin Bond

**UNIT IV**

The Panorama of India's Past : Jawaharlal Nehru

The Origin of Grammar : Margaret Bryant & Janet

**UNIT V**

Dangers of Drug Abuse : Hardin B. Jones

Crime and Punishment : R.K. Narayan

**Text Book** : Dr. Ananthan , R. Effective Communication. Ed. Chennai : Anu Chithra Pub.2010.

**Semester : II**  
**Instruction Hours/ Week : 2**

**Communicative English Course : I**  
**Credit : 1**

**COURSE OBJECTIVES:**

**The Learner will be able to**

1. communicate, to define, classify, and understand the methods of communication,
2. improve their LSRW skills,
3. enable them to practice those skills in their daily life by identifying instances of communication in the circumstances of their own.

**UNIT I**

Writing Stories

Grammar Components : Articles, Prepositions and Tenses

**UNIT II**

Precis Writing

Grammar Components : Non- Finite Verbs and Phrasal Verbs

**UNIT III**

Writing Letters

Grammar Components : Conjunctions and Interjections and Punctuation

**UNIT IV**

Reporting

Grammar Components : Reported Speech and Transformation of Sentences

**UNIT V**

Writing an Essay

Grammar Components : Sentence structure (S/V/O/C/A) and Simple, Compound and Complex Sentences

**Text book** : Pillai, Radhakrishna G. English Grammar & Composition Ed. Chennai : Emerald Pub.2016

**ENGLISH FOR COMPETITIVE EXAMINATIONS – U19E3**

**SEMESTER : III**

**ENGLISH LANGUAGE COURSE : III**

**INSTRUCTION HOURS/WEEK : 6**

**CREDIT : 3**

**COURSE OBJECTIVES:**

The Learner will be able to

1. have a knowledge in basic grammatical units of English
2. have a depth of knowledge in Concord, reconstructing passages and précis writing.
3. comprehend the given passage and understand it.
4. gain a good knowledge and understanding in vocabulary
5. write on his/her own on a given topic and gain a good skill in letter/report writing.

**UNIT I:**

Basics of English( Revision)

- (a)Parts of speech and Articles
- (b)Active and passive voice
- (c)Framing Questions
- (d)Tag questions
- (e)Indirect speech
- (f)Tenses

**UNIT II:**

- (a)Errors and how to avoid them
- (b)Spotting errors
- (c)Reconstructing passages
- (d)Précis writing

**UNIT III:**

Reading comprehension

**UNIT IV:**

- (a)Sentence completion,
- (b) Spelling
- (c)Vocabulary – Words often confused or Misused, Synonyms, Antonyms.

**UNIT V:**

Letter writing , Report writing ,Paragraph writing, Essay writing

**Text book : English for Competitive Examinations** by R.P.Bhatnagar&Rajul Bhargava  
macmillanIndia ltd. Delhi.

**COURSE OBJECTIVE:**

The Learner will be able to

- a. appreciate a piece of poem and analyze it
- b. appreciate and interpret an one act play.
- c. use English effectively for study purpose across the curriculum;
- d. develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;
- e. revise and reinforce structure already learnt.

**POETRY:**

**UNIT I :** John Milton : On His Blindness

Oliver Goldsmith : The Village School Master

William Wordsworth : The Solitary Reaper

**UNIT II :** P.B.Shelly : Ozymandias

John Keats : La Belle Dame Sans Merci

Robert Browning : Incident of the French camp

**UNIT III :** John Masefield : Laugh and Be Merry

Robert Frost : Stopping by Woods On a Snowy Evening

John Drinkwater : The Vagabond

**DRAMA:**

**UNIT IV:** Anton Chekov : A Marriage Proposal

Lady Gregory : The Rising of the Moon

**UNIT V:** W.St. John Tayleur : Reunion

William Shakespeare : Othello, The Moor of Venice – Act V

**Text Books :** 1)An Introduction to Poetry edited by A.G.Xavier; [Macmillan]

2)A Book Plays: A Group of Editors, Published by Orient Blackswan

## COMMUNICATIVE ENGLISH II – U19CE2

**SEMESTER : IV**

**INSTRUCTION HOURS/WEEK : 2**

**COMMUNICATIVE ENGLISH COURSE : II**

**CREDIT : 1**

### **The learner will be able to**

1. develop interest in and appreciation of Literature;
2. develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;
3. integrate the skill of Reading a variety of texts.
4. use English effectively for study purpose across the curriculum

### **UNIT I:**

Enriching Vocabulary – Register Development; who is who; Synonyms, Proverbs

### **UNIT II:**

Tense Forms with emphasis on differences between Present and Present Continuous; Past and Present Perfect , Framing questions, Auxiliaries, if clauses; conjunctions and linkers; Prepositions

### **UNIT III**

Pronunciation, Good Pronunciation habits, Phonetic Transcription, Greetings, Farewells commands etc.,

### **UNIT IV:**

Conversational Skills – Affirmative or Negative Language – idiomatic expressions, Phrases, Dialogue Writing,

### **UNIT V:**

- Writing Skills – Note- taking, note- making, e-mail, Describing an object, narrating a story.
- Circulars
- Notes - reminders, warnings, farewells, apology.
- Draft invitations – marriage, annual day, inaugural functions of associations, valediction, seminar, workshop.
- Draft Short messages- compliments, birthday wishes, notifications
- Draft Posters- Slogans, Announcements
- Draft Advertisements
- Dialogue writing

### **Text Book**

1. Communicative English by Department of English, National College( Autonomous), Trichy.



# **SYLLABUS**

## **UG Part I – Hindi**

### **Semester – 1**

**U19HI : Functional Hindi-1, Prose, Grammar And Translation – 1**

#### **Objectives :**

**Unit I : The Objective of teaching functional Hindi is to encourage the students to learn the functional words.**

**Unit II : The Objective of teaching grammar is to teach the basic grammatical structures.**

**Unit III : The Objective of teaching prose is to develop their language ability.**

**Unit IV : The Objective of teaching translation is to convey the original tone and meaning.**

**Unit V : The Objective of teaching short stories is to enhance their creative writing and spoken skills through story telling/story writing and story reading mode.**

#### **Program Outcome :**

**The learners will acquire the knowledge of basic letters and functional hindi words. They understand the grammatical structures and able to translate the sentences from source to target language. The learners can read and understand the prose and stories.**

# SEMESTER – I

**COURSE CODE : U19H1**

**6hrs/wk**

## **Paper I – FUNCTIONAL HINDI-1, PROSE, GRAMMAR AND TRANSLATION – 1**

### **Unit – 1 Functional Hindi**

1. Directions, Seasons, Days, Colours
2. Fruits, Vegetables, Flowers, Numbers
3. Groceries, Grains, Taste, Cardinals
4. Domestic Animals, Wild Animals, Relatives, English Month
5. Occupation, Parts of Body, Numbers and Tamil Months

### **Unit – II Grammar**

1. Noun
2. Verb
3. Pronoun
4. Vachan
5. Gender

### **Unit – III Prose**

1. Challis karod kurta kaha se....
2. Bhojan Aur Vigyan
3. Dr. Abdul Kalam

### **Unit – IV Translation**

1. (Hindi to English Lesson -1 to 5 )

### **Unit – V Story**

4. Raja Ka Chunaav – Ashok Kumar Kantha Bhatiya
5. Poos Ki Raat – Premchand

## **DEPARTMENT OF HINDI**

For Candidates admitted from the Academic Year 2019 onwards

### **SEMESTER – 1**

Course Code U19H1

Credits – 3

## **Paper I – FUNCTIONAL HINDI-1, PROSE, GRAMMAR AND TRANSLATION – 1**

### **PROSE**

#### **Prescribed Text Book**

**Bharat – Madhyama Patya Samgiri**

**O.No.1619 Hindi Prachar Pushtakmala, Madras.**

#### **Prescribed Lessons**

1. Challis karod kurta kaha se....
2. Bhojan Aur Vigyan
3. Dr. Abdul Kalam

### **STORY**

**Vaani Hindi Patmala – Ashok kumar , kanta Bhatya**

**Oxford University Press ISBN-10:0-19-9469687**

1. Raja Ka Chunaav – Ashok Kumar Kantha Bhatiya

**Poos Ki Raat – Premchand**

### **Grammar**

#### **Reference Book**

**Sugam Hindi Vyakaran - Prof.Vanshi Dhar and Dharmapal Shastri**

**Siksha Bharathi, New Delhi**

**ISBN-10:81-7483-037-5**

#### **Prescribed Portion**

**Noun, Verb, Pronoun, Vachan, Gender**

### **Functional Hindi**

**Hindi Vataayan – Dr. K.M.Chandra Mohan**

**ISBN : 81-7124-223-5, Vishwa Vidhyalay Prakashan, Varanasi**

## Semester – II

**U19H2 : Comprehension, Grammar – 2, Drama And Hindi Literature-1**

### **Objectives :**

- Unit I :** The Objective of teaching comprehension is to incorporate self-reading and understanding.
- Unit II :** The Objective of teaching grammar is to acknowledge the basic rules of the grammatical structures.
- Unit III :** The Objective of teaching Literature is to acquire the knowledge of the origin of Hindi in literature.
- Unit IV :** The Objective of teaching one act play is to help the learners to understand the method of acting and writing a play.
- Unit V :** The Objective of teaching Drama is to acknowledge the basic dramatic structures.

### **Program Outcome :**

The Learners will be able to comprehend on their own and to improve their reading skills. The learners will be able to communicate accurately free of grammatical errors. The learners will get a widen knowledge of Hindi literature. The learners will understand various geners of literary works. The learners will get deep and broad vision of drama.

## **SEMESTER - II**

**COURSE CODE : U19H2**

**6hrs/wk**

### **PAPER II – COMPREHENSION, GRAMMAR – 2, DRAMA AND HINDI LITERATURE-1**

#### **Unit – 1 Comprehension**

1. Discipline
2. Humanity
3. Coeducation
4. Student Life
5. Importance of Hard work

#### **Unit – II Grammar**

1. Adjective
2. Adverb
3. Conjunction
4. Tense

#### **Unit – III Hindi Literature**

1. Aadi kaal ( Introduction, Specialities, Famous Poets)

#### **Unit – IV One act play**

1. Reed ki Hadhi ( Jagdeesh Chandra Mathur )
2. Andheri Nagari ( Bharathendu Harischandra )

#### **Unit – V Drama**

1. Swarg ke Jalak ( Upendranath Ashak )

## **DEPARTMENT OF HINDI**

For Candidates admitted from the Academic Year 2019 onwards

U19H2

### **SEMESTER – II**

## **PAPER II – COMPREHENSION, GRAMMAR – 2, DRAMA AND HINDI LITERATURE-1**

### **Comprehension**

#### **Prescribed Text Book**

**Adhunik Hindi Nibandhavali - Praveshika Book**

**Hindi Prachar Pushtakmala, Madras.**

#### **Prescribed Lessons**

1. Discipline
2. Humanity
3. Coeducation
4. Student Life
5. Importance of Hard work

### **One Act Play**

**Hindi Sahith Rastrabhasha patya saamgri**

**O.No.1636 Hindi Prachar Pushtakmala, Pushpa-507**

1. Andheri Nagari – Bharatendu Harishchandra
2. Reed ki Haddi – Jagdish Chandra Mathur

### **Drama**

**Swarg ki Jalak – Upendranath Ashk**

### **Grammar**

**Sugam Hindi Vyakaran - Prof.Vanshi Dhar and Dharmapal Shastri**

Siksha Bharathi, New Delhi

ISBN-10:81-7483-037-5

#### **Prescribed Portion**

Adjective, Adverb, Conjunction, Tense

### **Hindi Literature**

Aadi kaal ( Introduction, Specialities, Famous Poets)

#### **Prescribed Book**

1. **Hindi Sahithya ki Pravirthiya – Dr. Jaykisan Prasad**

## Semester – III

**U19H3 : Dialogue Writing, Poetry, Translation -2 Hindi Literature-2**

### Objectives :

- Unit I :** The Objective of teaching couplet will give learners confidence and energetic.
- Unit II :** The Objective of teaching dialogue writing is to teach the learners about appropriate words and style in appropriate place.
- Unit III :** The Objective of teaching Bhakthi Literature is to acquire the knowledge of the origin of Bhakthi and its movement in Hindi literature.
- Unit IV :** The Objective of teaching Poetry is to make the learners to acquire the knowledge of the poets and their writings.
- Unit V :** The Objective of teaching Translation to the learners to get knowledge of translation from the source to target language. They also gain the knowledge of homonyms and synonyms in Hindi.

### Program Outcome :

The Learners will understand the couplets and poetry by the prescribed units. The learners will come to know about the dialogue delivery and their usage in their daily life also they can translate from source to target language. They can understand the Bhakthi movement through Hindi Literature.

## SEMESTER - III

**COURSE CODE : U19H3**

**6hrs/wk**

**PAPER – III DIALOGUE WRITING, POETRY, TRANSLATION -2 HINDI  
LITERATURE-2**

### **Unit – I Couplets**

1. Couplets of Kabir
2. Couplets of Tulshi
3. Couplets of Rahim

### **Unit –II Dialogue Writing**

1. Mother and Daughter
2. Teacher and Student
3. Between Two Friends
4. Brother and Sister
5. Customer and Shopkeeper

### **Unit – III Hindi Literature**

1. Bhakthi Kaal (Introduction, Specialities, Famous Poets)

### **Unit – IV Poetry**

1. Baghavan ke Dakiye (Ramdhari singh Dinakar)
2. Tera Sneh na kovoona (Sumitranandan Pant)
3. Kilona (Chiyaram Saran Gupta)

### **Unit – V Translation**

1. English to Hindi (Lesson 1 to 5 )
2. Homonyms
3. Synonyms



## **DEPARTMENT OF HINDI**

For Candidates admitted from the Academic Year 2019 onwards

**U19H3**

### **SEMESTER – III**

#### **PAPER – III DIALOGUE WRITING, POETRY, TRANSLATION -2 HINDI LITERATURE-2**

##### **Couplets**

###### **Prescribed Text Book**

**Kavya Sourab - Hindi Prachar Pushtakmala, Pushpa- 437**

**O.No. 1242, Dakshin Hindi Prachar Sabha, Madras.**

###### **Prescribed couplet**

- 1. Kabir – 5 dohas**
- 2. Tulsi – 5 dohas**
- 3. Rahim – 5 dohas**

##### **Poetry**

###### **Prescribed Book**

**Vasanth III**

**Subodh Hindi Patmala – 3, Hindi Prachar Pushtakmala, Pushpa – 507, O.No.1636**

###### **Prescribed Poem**

- 4. Baghavan ke Dakiye - Ramdhari singh Dinakar**
- 5. Tera Sneh na kovoon - Sumitranandan Pant**
- 6. Kilouna - Chiyaram Saran Gupta**

##### **Dialogue Writing**

**Hindi Vataayan – Dr. K.M.Chandra Mohan**

**ISBN : 81-7124-223-5, Vishwa Vidhyalay Prakashan, Varanasi**

##### **Hindi Literature**

**Bhakthi Kaal (Introduction, Specialities, Famous Poets)**

###### **Prescribed Book**

**Hindi Sahithya ki Pravirthiya – Dr. Jaykisan Prasad**

##### **Translation**

**Subodh Hindi Patmala – 1**

**Hindi Prachar Sabha, Madras.**

###### **Prescribed Lessons**

**Lesson 6 to 10**

##### **Homonyms**

##### **Synonyms**

## Semester – IV

**U19H4 : Letter Writing, General Essay, Hindi Literature-3**

### Objectives :

- Unit I :** The Objective of teaching letter writing is to improve their communication skills through writing letters in formal and informal way.
- Unit II :** The Objective of teaching Modern Era in Hindi literature to acquire the knowledge of various subjects which was used in pre independence and post independence and also in recent years.
- Unit III :** The Objective of teaching Street play is to introduce theatre arts and the origin of today's theatre.
- Unit IV :** The Objective of teaching Technical words and phrases is to develop their writing skill. Writing essay will develop their creativity. The learners were encouraged to summarise a passage through precise writing.
- s Unit V :** The Objective of teaching Fiction is to acquire knowledge of a long story and their characteristics.

### Program Outcome :

The Learners will able to draft and structure letters on their own. They come to know about the modern era in Hindi literature. They understand the role of street play in recent times. They can be aware of using technical words and phrases. Now they can understand the role of fiction by reading and get the knowledge of authors vision.

## IV SEMESTER

Course Code: U19H4

6hrs/wk

### **PAPER IV- LETTER WRITING, GENERAL ESSAY,HINDI LITERATURE-3**

#### **Unit – I Letter Writing**

1. Leave Letter
2. Placing Order for Books
3. Complaint Letter

#### **Unit – II Hindi Literature**

1. Modern Era (Introduction, Specialities, Famous Poets)

#### **Unit – III Street Play**

1. Aurat

#### **Unit – IV**

1. Technical Words
2. Technical Phrases
3. General Essay
4. General Essay
5. Precise Writing

#### **Unit – V Novel**

1. Kadiyan ( Bhishma Sahani )

## **DEPARTMENT OF HINDI**

For Candidates admitted from the Academic Year 2019 onwards

**U19H4**

### **SEMESTER – IV**

#### **PAPER IV- LETTER WRITING, GENERAL ESSAY, HINDI LITERATURE-3**

##### **Letter Writing**

###### **Prescribed Letters**

6. Leave Letter
7. Placing Order for Books
8. Complaint Letter

##### **Street Play**

###### **Prescribed Book**

Indra Gandhi Rashtriya Mukta Vishva Vidhyalay, New Delhi.

ISBN – 81-7605-844-0

###### **Prescribed Play**

**Aurat**

##### **Hindi Literature**

Modern Era (Introduction, Specialities, Famous Poets)

###### **Prescribed Book**

**Hindi Sahithya ki Pravirthiya – Dr. Jaykisan Prasad**

###### **Prescribed Book**

**Hindi Vataayan – Dr. K.M.Chandra Mohan**

ISBN : 81-7124-223-5, Vishwa Vidhyalay Prakashan, Varanasi

###### **Prescribed Portion**

4. Technical Words
5. Technical Phrases
6. General Essay
9. General Essay
10. Precise Writing



NATIONAL COLLEGE (AUTONOMOUS)  
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(For the candidates admitted from June 2019 onwards)

SYLLABUS

SUBJECT CODE:U19S1

Unit I

संस्कृतभाषा देवनागरीलिपि: च - परिचयः  
कर्तृपद-परिचयः

- १। संस्कृत भाषा - प्रास्ताविकम्
- २। अक्षराभ्यासः, वर्णाः,
- ३। स्वराः, व्यञ्जननि, संयुक्ताक्षराणि, लेखनप्रकारः च
- ४। अकारन्त-शब्दाः
- ५। लिङ्गत्रयम्
- ६। वचनत्रयम्
- ७। विभक्तयः
- ८। अनुवाद-अभ्यासः
- ९। आङ्गल/तमिल् भाषायां संस्कृतात्
- १०। संस्कृते आङ्गल/तमिल् भाषातः

Unit II

क्रियापदानि (परिचयः)

1. वर्तमानकाले (लट्) धातवः

- १। अन्यपुरुष/प्रथमपुरुष;मध्यमपुरुष;उत्तमपुरुषः च
- २। एकवचनम्, बहवचनं च
- ३। क्रियापदानि - गम् (गच्छ), पिब्,पठ्, क्रीड्, वद्

2. पुल्लिङ्ग-कर्तृपदानि  
सर्वनामपदानि च

- १। बालकः, शिक्षकः, अध्यापकः, नृपः, देवः, मनुष्यः,  
हस्तः अलसः कुशलः, अहम् ,त्वं, सः।

3. नपुंसक-लिङ्ग-कर्तृपदानि

- १। पुस्तकम्, फलम्, दुग्धम्, घृतम्, उद्यानम्, पुष्पम्,  
जलम्, मधुरम्, कन्दुकम्, भोजनम्।

4. अव्ययानि

- १। तत्र, कुत्र, यत्र, अत्र, न, तदा, कदा, यदा-तदा,  
शीघ्रं, द्रुतम्, सत्त्वरम्, पश्चात्, अपि, सह, अतः  
साकम्, सार्धम्, समं, एव, तावत्, तु, यदि-तर्हि,  
सदा।

5. अन्ये अकारान्त-कर्तृपदानि

- १। सूर्यः, सायंकालः, प्रकाशः, वृद्धः, सत्यं, असत्यं,  
विद्यालयः, गृहम्, जलम्, दुग्धम्, मधुरम्, भोजनम्

## Unit III

1. अनुवाद-अभ्यासः

2. विभक्तीनां परिचयः

3. प्रश्न-निर्माण-पदानि

4. क्रियापदानि(लट्)

5. अनुवाद-अभ्यासः

उपर्युक्त-कर्तृ-क्रियापदानि वाक्येषु उपयोगः,  
अनुवाद-अभ्यासः च।

१। प्रथमा विभक्तिः - संबोधनप्रथमा-विभक्तिपर्यन्तं  
विभक्ति-अन्तानां परिचयः ,

२। विभक्ति-अन्तानां प्रत्ययैः आदेशाः

३। तृतीया विभक्तिः - सह, साकं सार्धम्, समं

४। चतुर्थी विभक्तिः - षष्ठ्याः विभक्तेः कृते प्रत्ययः

५। विना इत्यादीनां अव्ययानां उपयोगः।

किम्, कुत्र, कथं, किमर्थम्, कुतः, कदा।

वर्तमानकाले

भू (भव्) अस्, धाव् , कृ (कर्) अस्, धाव्,

पत्, आ-गम् (गच्छ्)।

आङ्गलात् संस्कृते/ संस्कृतात् आङ्गले

## Unit IV

1. विशेषण-विशेष्यौ

2. संख्यावाचकपदानि

3. सर्वनामपदानि

4. भविष्यत्काले क्रियापदानि (लृट् लकारः)

5. भोज्यपदार्थनामानि

१। रङ्गाः -शुक्ल-नील-पीत-रक्त-हरित-कपिश-  
चित्र-भेदाः। तथा अन्यानि सरलपदानि

२। तेषां विशेषणेषु उपयोगः

१। संस्कृते संख्यावाचकपदानि (0 त। १०  
पर्यन्तम्।

१। तद् शब्दः - पुल्लिङ्ग-स्त्रीलिङ्ग-  
नपुंसकलिङ्गाः

२। अस्मद् - युष्मद् शब्दौ।

३। एतद् शब्दः - त्रिषु लिङ्गेषु

१। गम् (गच्छ्), पठ्, वद, पत्, लिख्, क्रीड्,  
आ-गम्(गच्छ्), भू (भव्), धाव्, पा(पिब्),  
दृश्(पश्य्), कृ (कर्)।

१। तेषां वाक्येषु उपयोगः।

२। अनुवाद-अभ्यासः।

३। वार्तालापः

## Unit V

1. प्रत्ययाः
  - १। क्त-प्रत्ययः
  - २। तुमुन्नन्तः
  - ३। क्त्वा प्रत्ययः
  - १। अट्, भक्ष्, अर्च्, खेल्, चल्, धार्, कथ्, क्षाल्, पाल्, तुल्, मार्, घर्ष्, तोष्, गण्, ।
  - १। कृषीवलः इति पाठः।
  - २। नूतन-क्रियापदानि -क्री, वि-क्री, सिच्, रुह्, वर्ष्, रुह्, रच्, निस्ज्-कस्, वस्, कृष्, मुच् ।
2. क्रियापदानि (लट् लकारे)
3. कृषि-संबन्धीनि पदानि
4. आकारान्त-स्त्रीलिङ्गः
  - १। आकारान्तः स्त्रीलिङ्गः माला शब्दः
  - २। समानान्त-पदानि।
  - ३। पदानां वाक्येषु उपयोगः
  - १। सवर्णदीर्घ-सन्धिः
  - २। गुणसन्धिः
  - ३। वृद्धिसन्धिः
  - ४। सन्धीनां वाक्येषु उपयोगः
  - ५। सन्धीनां अभ्यासः
5. सन्धिः (स्वरः)

Prescribed Book: Saral Sanskrit Sikshak Part I, Bharatiya Vidya Bhavan, Mumbai, 400007.

(Omitted portions: Lesson 1: Passage starting: रामो राजमणिः with the meaning.

Lesson 6,7: Passage for memory (Memorise) at the end.

Lesson 10 and Lesson 12: Full)

References:

Sanskrita Bodhini (Prathama), Sanskrita Bhasha Pracharini Sabha, Chittoor, Andhra Pradesh, 2011।

NATIONAL COLLEGE (AUTONOMOUS)  
LANGUAGE COURSE PART I SANSKRIT SEMESTER II PAPER II SANSKRIT II  
(For the candidates admitted from June 2019 onwards)

SYLLABUS  
SUBJECT CODE: U19S2

Unit I

1. पुनश्चर्या

गतषाणंमासे अभ्यस्तानाम्

2. कर्तृपदानां परिचयः

१। इकारान्तः पुल्लिङ्गः कविशब्दः  
केचन समानान्त-शब्दः च।

२। सर्वनामशब्दः - तद् - स्त्रीलिङ्गे

३। इकारान्तः स्त्रीलिङ्गः मतिशब्दः,  
केचन समानान्त-शब्दाः च।

४। एतेषां वाक्येषु उपयोगः, अनुवाद-अभ्यासः च।

3. क्रियापदानि

वर्तमानकालः (लट्)

१। जप्, चर, रक्ष, हस्, वम्, नम्, दह, तप्, वस्,  
इच्छ, वाञ्छ, शंस्, त्यज्, जल्प, निन्द, क्षिप्।

२। वाक्येषु उपयोगः, अनुवाद-अभ्यासः च।

Unit II

1. भविष्यत्कालः (लृट्) नूतनक्रियापदानि

१। अर्ज्, दण्ड्, चिन्त्, ज्वल्, तर्ज्, तर्क्, तप्,  
नट्।

1. नूतनकर्तृपद-परिचयः

१। इकारान्त पुल्लिङ्गः तथा स्त्रीलिङ्गपदानि  
उपर्युक्त-क्रियापदानि च मिलित्वा वाक्येषु  
उपयोगः

2. आत्मनेपदिनः धातवः (क्रियापदानि)

वर्तमानकाले (लट्)

१। यत्, लभ्, रम्, क्षम्, त्रप् सह, स्वद्, बाध्,  
भाष्, भास्

२। पूर्वोक्त-कर्तृपदानि क्रियापदानि च वाक्येषु  
उपयोगः

३। अनुवाद-अभ्यासः

3. आत्मनेपदिनः धातवः (लट् क्रियापदानि)

१। भाष्, यत्, लभ्, रम्, क्षम्, त्रप्, सह, स्वद्,  
भास्



## Unit III

### 1. भूतकालः (लङ्)

- १। सर्वेऽपि धातवः वर्तमानकाले कृताः।
- २। भूतकालक्रियापदानि वाक्येषु उपयोगः।
- ३। वर्तमानकालं भूतकालं च मिश्रित्य वाक्येषु उपयोगः।
- ४। वाक्येषु उपयोगः अनुवाद-अभ्यासः च।

### 2. प्रेरणार्थकं क्रियापदम् (भविष्यत्) लोट्

- १। सर्वेऽपि धातवः ये वर्तमानकाले तथा भूतकाले कृताः।
- २। प्रेरणार्थकक्रियापदानि च वाक्येषु उपयोगः पूर्ववत् (मध्यमपुरुष-एकवचनमात्रम्)
- ३। अनुवाद-अभ्यासः

## Unit IV

### 1. सन्धिप्रकरणम्

- १। यण् सन्धिः
- २। अयादिसन्धिः

### 2. नूतन-कर्तृपदानि (पुल्लिङ्गः)

- १। उकारान्तः पुल्लिङ्गः गुरु शब्दः
- २। समानान्त-शब्दा केचन।
- ३। उकारान्त-पदानि वाक्येषु उपयोगः
- ४। अनुवाद-अभ्यासः
- ५। संख्यावाचकपदानि १ - २५ संस्कृते।

### ३। नूतन-कर्तृपदानि (स्त्रीलिङ्गः)

- १। उकारान्तः स्त्रीलिङ्गः धेनु शब्दः
- २। समानान्तक-शब्दाः केचन।
- ३। उकारान्त-पदानि स्त्रीलिङ्गे उपयोगः
- ४। अनुवाद-अभ्यासः
- ५। पुल्लिङ्ग-स्त्रीलिङ्ग-पदानि मिश्रित्य वाक्येषु उपयोगः ।

4. कथालेखनम्

१। पाठ्यक्रम-अन्तर्गत-कथा

२। नूतन-कर्तृपदानि (कथा-अन्तर्गतानि)

### Unit V

1. नूतन-प्रत्ययाः

१। क्तवतु प्रत्ययः- क्तप्रत्ययः

२। कर्तरि प्रयोगः कर्मणि प्रयोगः च

३। सन्नन्ताः - इच्छाप्रकृतिः(Desiderative)

2. नूतन-क्रियापदानि

१। प्रथ्, प्री, बन्द्, भूष्, मृज् (मार्ज्), युज्,

रच्, स्निह्, हिंस् (लट् परस्मैपदि, आत्मनेपदि)

२। उपरि अभ्यसित-धातु तथा प्रत्ययान् वाक्येषु  
उपयोगः

३। संभाषणम् - कालिदासकृतं अभिज्ञानशाकुन्तलम्।

Prescribed Book: Sarala Sanskrit Sikshak Part II, Bharatiya Vidya Bhavan,  
Mumbai 400007.

(Omitted portions: 1. Lesson 2: श्लोकाः (pages 14, 15)

2. Lesson 4, श्लोकः (page 23)

3. Lesson 10, सुभाषितानि, संस्कृत-लोकोक्तयः)

References:

1. संस्कृत-व्यवहार-साहस्री, Samskrita Bharati, Bengaluru 560085.

2. संस्कृतबोधिनी, प्रथमा, संस्कृतभाषाप्रचारिणि सभा, चित्तूर, आन्ध्रप्रदेश ५०७५०९  
संवत्सरः - २०११

NATIONAL COLLEGE (AUTONOMOUS)  
LANGUAGE COURSE PART I SANSKRIT SEMESTER III PAPER III SANSKRIT III  
SYLLABUS  
SUBJECT CODE: U19S3

Unit I

- १। पुनश्चर्या
- २। पशु-पक्षि-वृक्ष-वर्ग-शलाटुका-फल-नामानि
- ३। वाणिज्य-उपयोगि-पदानि  
मापनं तोलनं च
- ५। संख्यावाचकपदानि
- ६। संवत्सरनामानि
- ७। सस्यादि नामानि
- ८। धन/धनपत्र/नाणक नामानि
- ९। इदं शब्दः - पुंनपुंस्त्रीषु।
- १०। अनुवाद अभ्यासः

Unit II

- १। क्रियापदानि  
लोट् लकारे परस्मैपदि, आत्मनेपदि च
- २। इतोऽपि अव्ययानि
- ३। कथालेखनप्रकारः
- ४। अनुवादः
- ५। उपसर्गाः
- ६। तेषां वाक्येषु उपयोगः

Unit III

- १। ईकारान्त-स्त्रीलिङ्गपदानि  
नदी, अटवी, कौमुदी, वाहिनी, नगरी  
इत्येतानि पदानि, तेषां शब्दरूपानि च
- २। क्रियापदानि, परस्मैपदिनः
- ३। आत्मनेपदिनः
- ४। उभयपदिनः
- ५। शरीर-अङ्गनामानि, भूषण-नामानि
- ६। ऋकारान्तःपुल्लिङ्ग-शब्दाः कर्तृ, पितृ,  
इत्यादयः
- ७। क्रियापदानि
- ८। अनुवाद-अभ्यासः

## Unit IV

- १। कृषिकर्म
- २। कृषिसंबन्धीनि उपकरणानि
- ३। अनुवाद-अभ्यासः
- ४। ल्यबन्ताः
- ५। वाक्येषु उपयोगः
- ७। विधिलिङ् (optative/potential mood)-1
- ८। परस्मैपदि आत्मनेपदि च

## Unit V

- १। नकारान्तः पुल्लिङ्गः राजन् शब्दः
- २। सन्धिप्रकरणम् - पुनश्चर्या
- ३। विसर्गसन्धिः
- ४। नूतन-अव्यय-पदानि
- ५। अनुवाद-अभ्यासः
- ६। विधिलिङ् ( optative/potential mood)-2
- ७। भोजनवेला - संवादः
- ८। नूतन-कर्तृ-क्रिया-अव्यय-विविध-प्रत्यय-पदानि ।
- ९। शब्दरूपाणि, धातुरूपाणि च पुनश्चर्या ।

Prescribed books: 1. Saral Sanskrit Sikshak, Part III, Bharatiya Vidya Bhavan, Mumbai 400007.

Omitted portions: 1. Lesson 9 सीतायाः स्वयंवरः

2. Lesson 11, सुभाषितानि, संस्कृत-लोकोक्तयः

## References:

1. Samskrita-vyavaharasahasri, Samskrita Bharati, Bengaluru 85
2. Anjala-samskrita kosha, Samskrita Bharati, Bengaluru 85.

NATIONAL COLLEGE (AUTONOMOUS)  
LANGUAGE COURSE PART I SANSKRIT SEMESTER IV PAPER IV SANSKRIT IV  
SYLLABUS  
SUBJECT CODE: U19S4

Unit I

- १। प्रथम-षाण्मासिक, द्वितीय-षाण्मासिक, तृतीय-षाण्मासिक-अभ्यस्तानां विषयाणां पुनश्चर्या
- २। सर्व-शब्दः त्रिषु लिङ्गेषु।
- ३। वाच् शब्दः स्त्रीलिङ्गेषु
- ४। अनुवाद-अभ्यासः
- ५। हिमालयः - रचनालेखनम्

Unit II

- १। ओकारान्तः स्त्रीलिङ्गः गो शब्दः
- २। गो-संबन्धीनि पदानि
- ३। गां अधिकृत्य लेखः
- ४। नूतन-कर्तृ-क्रियापदानि - शब्दसंग्रहः
- ५। अनुवाद-अभ्यासः
- ६। पदानां वाक्येषु उपयोगः

Unit III

- १। समासः - उपोद्घातः
- २। तत्पुरुष-समासः
- ३। कर्मधारय-समासः
- ४। बहुव्रीहि-समासः
- ५। द्वन्द्व-समासः
- ६। द्विगु-समासः
- ७। अव्ययीभाव-समासः
- ८। एकशेषसमासः

संस्कृतम् - दैनन्दिनव्यवहारः

1. संस्कृत-व्यवहारः

- १। संख्यावाचकपदानि २५ तः ५० पर्यन्तम्।
- २। बन्धुवर्गनामानि
- ३। गृहे उपयुक्तानां वस्तूनां नामानि
- ४। वासर-तिथि-पक्ष-मास-नामानि
- ५। दैवत-ग्रहाणां नामानि

## UNIT IV

1. रचनात्मकं कार्यम्

- १। पत्रलेखन- उपोद्घातः, उदाहरणानि च
- २। पिता/माता - पुत्राय/पुत्र्यै
- ३। पितरं/मातरं प्रति - पुत्रः/पुत्री
- ४। मित्राय पत्रम्
- ५। पतिः/पत्नी - पत्न्यै/पत्ये

2. अनुच्छेदः

- १। दत्तं अनुच्छेदं पठित्वा उत्तरलेखनम् - प्रकारः
- २। सरल-कथायुक्तम्, सरल-गद्यांशयुक्तम् च।

3. अनुच्छेदलेखनम्

- १। दत्तानि पदानि विचित्य पञ्चवाक्येषु एकम् अनुच्छेद-लेखनम्।
- २। सरलकथा अथवा गद्यांशयुक्तम्।

4. रचनालेखनम् (पाठ्यपुस्तक-अन्तर्गतम्)

- १। सरलकथा
- २। गद्यांशः

## UNIT V

1. श्रेष्ठभाषा द्रविडभाषा - अस्याः ऐतिहासिकं स्थानम्।

- १। भाषायाः स्थापनम्
- २। भाषा-समूहः
- ३। श्रेष्ठभाषायाः गुणानि।
- ४। श्रेष्ठभाषाः
- ५। भारतीय-श्रेष्ठ-भाषे - द्रविड-संस्कृते
- ६। द्रविडभाषायाः पुराणत्वम्।
- ७। द्रविडभाषां श्रेष्ठभाषा-समूहे योजयितुमान्दोलनम्।
- ८। विश्व-श्रेष्ठद्रविडभाषा सम्मेलनम् २०१०

Prescribed Book: Sarala Sanskrit Sikshak Part IV, Bharatiya Vidya Bhavan,  
Mumbai 400007.

(Omitted portions:

Lesson 2: विद्याप्रशंसा, Lesson 7: लङ्कातः यदा हनूमान् प्रतिनिवृत्तः Lesson 8: रामस्य वनगमनम्  
Lesson 12: नलदमयन्ती-वर्णनम् Lesson 13: किङ्करैः पश्य किं कृतम् Lesson 14: रूपाणि  
Lesson 15: सुभाषितानि Lesson 17: लोकोक्तयः।)

References:

1. संस्कृतव्यवहारसाहस्री, संस्कृतभारती, बेङ्गलूरु ५६००८५।

2. संस्कृतबोधिनी (द्वितीया), संस्कृतभाषाप्रचारिणी सभा, चित्तूर, आन्ध्रप्रदेशः ५१७५०१।

# DIFFERENTIAL CALCULUS AND TRIGONOMETRY – U19MS1

**Semester: I**

**Core Course: I**

**Instruction Hours/Week: 5**

**Credit: 5**

## **Course Objectives:**

1. To Study the Knowledge of successive differentiation
2. To Study the logarithmic of Complex number
3. To Understand the Knowledge of Trigonometric functions.

## **UNIT I**

$n$ th derivative of standard functions – Leibnitz's Theorem - Related problems - Maxima and Minima of function of two Variables –Lagrange multipliers (Related problems only).

## **UNIT II**

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

## **UNIT III**

Expansions of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\tan n\theta$ , – Expansions of  $\sin^n\theta, \cos^n\theta, \sin^n\theta\cos^m\theta$  -Expansions of  $\sin\theta, \cos\theta, \tan\theta$  in powers of  $\theta$ .

## **UNIT IV**

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

## **UNIT V**

Logarithm of a complex number –Summation of Trigonometric series –Difference method-Angles in arithmetic progression method –Gregory's Series.

## **TEXT BOOK(S)**

1. T.K.Manickavasagam Pillai & others, Differential Calculus, S.V.Publications, Chennai – 1985 Revised Edition. (Units I & II)
2. S.Arumugam & others, Trigonometry, New Gamma Publications -1985 Revised Edition. (Units III, IV & V).

## **REFERENCE BOOK(S)**

1. Arumugam and Isaac, Calculus, Volume1, New Gamma Publishing House, 1991.
2. S. Narayanan, T.K. Manichavasagam Pillai, Trigonometry, S.Viswanathan Pvt Limited, and Vijay Nicole Imprints Pvt Ltd, 2004.
3. P.Duraipandiyan, Laxmi Duraipandiyan and Jayamala Paramasivam, Trigonometry, Emerald Publishers, Chennai, Reprint 1999.

## **Course Outcomes:**

1. Knowledge of polar equations.
2. Basic knowledge of differentiation, expansion of functions and their applications.
3. Knowledge of curvatures, Evolutes in Cartesian and polar co-ordinates.
4. Application of binomial theorem.
5. Expansion of exponential and logarithmic series.
6. Knowledge of trigonometric functions.
7. Basic Knowledge in Hyperbolic functions.

## INTEGRAL CALCULUS AND FOURIER SERIES

Semester: I & II

SUBJECT CODE:U19MS2

Core Course: II

Instruction Hours/Week: 3&3

Credit: 6

### Course Objectives:

1. To Study the Various techniques of integration.
2. To Know the Applications of improper integrals .
3. To Understand the Knowledge in Fourier series

### UNIT I

Definite integrals - Integration by parts – reduction formula – related problems.

### UNIT II

Double integral in Cartesian and polar coordinates –changing the order of integration – Triple Integral .

### UNIT III

Beta and Gamma functions - relations between them –Evaluation of Integrals using Beta and Gamma functions.

### UNIT IV

Fourier series- definition - Fourier Series expansion of periodic functions with Period  $2\pi$  – Use of odd & even functions in finding Fourier Series- Half-range Fourier Series- Development in sine, cosine series

### UNIT V

Change of interval- Fourier Series Expansion of periodic functions with period  $2l$ -Half range Fourier Series – definition- Combination of series.

### TEXT BOOK(S)

1. S.Narayanan and T.K.Manickavasagam Pillai, Calculus Volume II, S.V Publications, Reprint 2003. (Unit I, II & III).
2. S. Narayanan, T.K. Manicavachagam Pillai, Calculus, Vol. III, S. Viswanathan Pvt Limited, and Vijay Nicole Imprints Pvt Ltd, 2004. (Unit IV & V)

**Unit-1:** Chapter-I: Sections- 11,12,13. ,

**Unit-2:** Chapter-5: Sections- 1 to 6.

**Unit-3:** Chapter-7. ,

**Unit-4:** Chapter-6:Sections- 1 to 5.

**Unit-5:** Chapter-6:Sections- 6 & 7.

### REFERENCE BOOK(S)

1. Shanthi Narayanan, Integral Calculus, S.Chand & Co., 2000.
2. S.Sudha, Calculus, Emerald Publishers, Chennai, 1998 –First Edition.

### Course Outcomes:

1. Various techniques of integration.
2. Applications of definite integrals.
3. Applications of integration.
4. Applications of improper integrals .
5. Techniques of Beta, Gamma integrals.
6. Various integration formulae
7. To Understand the Knowledge in Fourier series



# ANALYTICAL GEOMETRY (3D) & VECTOR CALCULUS

Semester : II  
Instruction Hours/Week: 5

SUBJECT CODE:U19MS3

Core Course: III  
Credit: 5

## Course Objectives:

1. To study the Geometric Interpretation of Spheres and Planes
2. To Understand the Concept of Line Integral, Surface Integral and Volume Integral.

### UNIT I

Skew lines - shortest distance between two skew lines - Equation of the line of shortest distance - Sphere – section of a sphere by a plane - intersection of two spheres – Tangent plane.

### UNIT II

Cone – right circular cone – condition for a plane to touch the quadratic cone – cylinder – right circular cylinder.

### UNIT III

Vector differentiation – velocity and acceleration - Vector and scalar fields – gradient - directional derivative – divergence & curl – Laplacian operator – related problems.

### UNIT IV

Vector integration – Line integral – conservative force field – scalar potential - work done by a force - surface integral - Volume integral – simple problem.]

### UNIT V

Gauss Divergence Theorem – Stoke's Theorem - Green's Theorem (statement only) – simple problems and verification of the theorems for simple problems.

### TEXT BOOK(S)

1. T.K.Manickavasagam Pillai & T.Natarajan, A Text book of Analytical Geometry (Part II – Three Dimension), S.Viswanathan Pvt. Ltd., Reprint 2002.(Units I & II)
2. M.L. Khanna, Vector Calculus, Jai Prakash Nath and Co., 8th Edition, 1986.(Units III, IV&V)

**Unit-1: Chapter-III: Sections- 5 to 8.[1]**

**Chapter-IV: Sections- 1 to 8.[1]**

**Unit-2: Chapter-V: Sections- 1,2,5, & 8.[1]**

**Unit-3: Chapter-I: Sections- 1 to 4[2]**

**Chapter-II: Sections – 7 to 9.[2]**

**Unit-4: Chapter-III: Sections- 1 to 4.[2]**

**Unit-5: Chapter-V: Sections- 5& 6.[2]**

### REFERENCE (S)

1. P.Duraipandiyan, Laxmi Duraipandiyan, D.Muhilan, Analytical Geometry Three dimensional, Emerald Publishers, Chennai, Reprint 2003.

2. Shanthi Narayanan and Mittal P.K., Analytical Solid Geometry, 16th Edition, S.Chand & Co., New Delhi.
3. N.Saran and R.S.Gupta, Analytical Geometry of 3D, Pothishala Pvt. Ltd., Allahabad.
4. P.R.Vittal and V.Malini, Vector Analysis, Margham Publications, Chennai, 2000.
5. S. Shanthi Narayanan, A Text Book of Vector Calculus, S.Chand & Co., New delhi.
6. K.Viswanathan and S.Selvaraj, Vector Analysis, Emerald Publishers, Chennai Reprint 1999.

**Course Outcomes:**

- 1. Introduction of direction cosines of a line, and its properties.**
- 2. Concepts of a plane, its various forms, determination of planes under given conditions .**
- 3. The students are introduced to the concept of a line, sphere and its properties, circles and tangent planes, Cones and Cylinders.**
- 4. Concepts of gradient, divergence curl and their properties.**
- 5. Evaluation of line, surface integrals and volume apply them to verify the Green's, stokes and Gauss divergence theorem.**

# DIFFERENTIAL EQUATIONS

Semester: III            SUBJECT CODE:.....  
Instruction Hours/Week:4

Core Course: IV  
Credit: 4

## Course Objectives:

1. Ordinary differential equations arise as a natural mathematical model of many physical situations and hence the concepts involved in solving them are rudiments and vital for the course. The main objective is to give elementary, thorough, systematic approach for the subject.
2. The existence and uniqueness of solutions for first order differential equations are studied in detail. Qualitative properties of solutions are carried out elaborately.

## UNIT-I

Solving Differential equations of the form  $Mdx + Ndy = 0$  - First order, higher degree  
Differential equations: solvable for  $x$ , solvable for  $y$ , solvable for  $dy/dx$ , Clairaut's- form simple problems.

## UNIT-II

Particular integrals of second order Differential Equations with constant Coefficients –  
Linear equations with variable coefficients – simultaneous differential equations - Method  
of variation of Parameters (Omit third & higher order equations)

## UNIT-III

Formation of Partial Differential Equation-General, Particular & Complete integrals –  
Solution of PDE of the standard non-linear PDE forms – Lagrange's Type - Related problems.

## UNIT-IV

Homogeneous Linear partial Differential equations with constant coefficients.

## UNIT-V

Partial Differential Equations of Second order - Separation of variables - Eigen values and  
eigen functions - one dimensional and two dimensional diffusion equations (Cartesian form).

## TEXT BOOK:

1. M.D. Raisinghania, Ordinary & Partial Differential Equations, S.Chand & Co., 2001 (for Units I & IV)
2. S.Narayanan, & T.K.Manickavasagam Pillai "Differential Equations" S.Viswanathan Publishers 1996 (for Units II, III & V).

**UNIT I - Chapter II: section 6.1-6.4 (page 20-28), Chapter IV: page (60-67) [2]**

**UNIT II - Chapter V: Section 1 to 6 (page 68-96), Chapter VI : section 6 (page 125-130) [2]**

**Chapter VIII: section 4 (page 151-155) [2]**

**UNIT III - Chapter XII : Section 1 to 5 (page 219-242), Chapter VI (page 119-124) [2]**

**UNIT IV - Chapter IV : page (4.1-4.31) (Part III), [1]**

**UNIT V - : Chapter XIII (page 250-265) [2]**

**Reference(s):**

1. Dr.S.Arumugam et al “Differential Equations & Applications”New Gama Publications 2003.
2. M.L.Kanna “Differential Equations” Jaiprakash North 2005

**Course Outcomes**

- 1. Developing the skills of solving DE.**
- 2. Understanding the Concepts of Partial Differential Equations.**
- 3. Solving PDEs of first and second order.**
- 4. Solving DE using Laplace Transforms.**
- 5. Application of PDE on one dimensional and two dimensional Equations.**

## CLASSICAL ALGEBRA

Semester: III & IV

SUBJECT CODE:.....

Core Course: V

Instruction Hours/Week: 3&3

Credit: 5

### Course Objectives:

1. To Study the Relations between the roots and coefficients of equations.
2. To Understand the concepts of Various Inequalities.
3. To Understand the Concepts in Theory of Numbers

### UNIT I

Relation between roots and coefficients of polynomial equations-Symmetric functions-Sum of the  $r^{\text{th}}$  powers of the roots.

### UNIT II

Transformation of equations – Diminishing, Increasing and Multiplying the roots by a constant-Forming equations with the given roots-Reciprocal equations-all types-Descartes' rule of Sign (statement only)-simple problems

### UNIT III

Inequalities-elementary principles-Geometric and Arithmetic means- Weierstrass inequalities-Cauchy inequality-Applications to maxima and minima.

### UNIT IV

Theory of numbers-Prime and Composite numbers-Divisors of a given number  $N$ -Euler's function  $\phi(N)$  and its value-The highest power of a prime  $p$  contained in  $N!$ -Congruence-Fermat, Wilson's and Lagrange's Theorems.

### UNIT V

Rank of a matrix-Consistency-Eigen values, Eigen vectors-Cayley Hamilton's Theorem (statement only)-Symmetric, Skew symmetric, Orthogonal, Hermitian, Skew Hermitian and Unitary matrices-Simple problems only.

### TEXT BOOK(S)

1. T.T.K.Manicavachagam pillay & others, Algebra Vol .I S.V.Publications 2008
2. T.K.Manickavasagam pillay & Others, Algebra Vol.II, S.V.Publications 2008.

**Unit I - Chapter 6 Sections 11 to 14 of (1)**

**Unit II- Chapter 6 Sections 15 to 20 & 24 of (1)**

**Unit III- Chapter 4 of (2)**

**Unit IV – Chapter 5 of (2)**

**Unit V - Chapter 6 sections 1, 6,9,11 & 16 of (2).**

## **REFERENCE(S)**

1. S.Arumugam & A.Thangapandi Issac, Modern Algebra, New Gamma Publishing House,2003
2. H.S.Hall and S.R.Knight, Higher Algebra, Prentice Hall of India, New Delhi.

## **Course Outcomes:**

- 1. Foundations for the study of Pure Mathematics.**
- 2. Relations between the roots and coefficients of equations**
- 3. Transformations of equations**
- 4. Formation of equations.**
- 5. Important Methods in finding roots.**
- 6.To Understand the Concepts in Theory of Numbers**
- 7. Knowledge in Operative Algebra**

## SEQUENCES AND SERIES

Semester : IV

SUBJECT CODE:.....

Core Course: VI

Instruction Hours/Week:4

Credit: 4

Course Objectives:

1. To Study the Concepts of Sequences and Series.
2. To Understand the behavior of convergence of series by using tests.

### UNIT I

Sequence (definition)-Bounded sequences-monotonic sequence – Convergence sequences – Divergence & Oscillation sequences – The Algebra of limits – Behavior of monotonic sequences- Simple problems.

### UNIT II

Sub Sequence – Limit points – Cauchy's general principal of convergence – The upper and lower limits of Sequence – Infinite series – simple problems.

### UNIT III

Comparison test – Geometric series - Harmonic series –D'Alembert's ratio test Raabe's test – Gauss's test. Simple problems based on above tests.

### UNIT IV

Cauchy's condensation Test – Cauchy's root test – Alternative series – Leibnitz's test – Absolute convergence – simple problems based on above.

### UNIT V

General summation of series including successive difference and recurring series.

### TEXT BOOK(S)

1. Dr.S.Arumugam, Sequences & Series, New Gamma Publishers, 1999.
2. T.K.Manicavachagam Pillai, T.Natarajan, K.S.Ganapathy, Algebra, Vol I, S.Viswanathan Pvt Ltd., Chennai, 2004.

UNIT I - Chapter 3 Sections 1 to 7 of (1)

UNIT II - Chapter 3 Sections 9 to 12 of (1)

UNIT III - Chapter 4 Sections 4.2, 4.3 of (1)

UNIT IV - Chapter 4 Sections 4.4 & Chapter 5 Sections 5.1, 5.2 of (1)

UNIT V - Chapter 5 Sections 2 to 7 of (2)

### REFERENCE(S)

1. M.k.Singal & Asha Rani Singal, A first course in Real Analysis R.Chand & Co., 1999.

### Course Outcomes:

1. Getting a good foundation for classical analysis.
2. Understanding the behavior of monotonic functions.
3. Knowing limits and Cauchy sequences.
4. Studying the behavior of convergence of series by using tests.
5. Solving the problems related to sequence and series.
6. Behaviour of divergent sequences

# ABSTRACT ALGEBRA

Semester : V

SUBJECT CODE:.....Core Course: VII

Instruction Hours/Week:5

Credit: 5

## Course Objectives:

1. To Study the concepts of Groups.
2. To Understand the concept of Vector Spaces.

## UNIT I

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

## UNIT II

Normal Subgroups and Quotient groups – Isomorphism & Homomorphisms.

## UNIT III

Rings-Definition and Examples –Elementary Properties of Rings- Isomorphism-Types of Rings-Characteristic of a Ring-Sub rings- Ideals-Quotient rings-Maximal & Prime Ideals- Homomorphism of Rings.

## UNIT IV

Vector Spaces-Definition & Examples-Subspaces-Linear Transformation-Span of a set – Linear independence.

## UNIT V

Basis & Dimension – Rank & Nullity- Matrix of a Linear Transformation.

## TEXT BOOK(S)

1. S.Arumugam & A.Thangapandi Isaac, Modern Algebra, Scitech Publication (India) Pvt Limited – August 2003.

**UNIT I - Chapter 3 section 3.5 to 3.8**

**UNIT II - Chapter 3 section 3.9 to 3.11**

**UNIT III - Chapter 4 section 4.1 to 4.9 & 4.10**

**UNIT IV - Chapter 5 section 5.1 to 5.5**

**UNIT V - Chapter 5 section 5.6 to 5.8**

## REFERENCE(S)

1. T.K.Manickavasagam Pillai. T.Natarajan, K.S.Ganapathy, Algebra, Vol.1, S.Viswanathan Pvt Ltd, Chennai, 2004.
2. M.L.Santiago, Modern Algebra, Arul Publication, Madras 1988.
3. M.L.Santiago, Modern Algebra, Tata McGraw Hill, 2003.

## Course Outcomes:

1. Acquiring knowledge of basic abstract systems of Mathematics.
2. Present concepts and properties of various algebraic structures.
3. Develop the ability to form and evaluate conjectures in graphs.
4. Discuss the importance of cyclic groups.
5. Present concepts of the relationships between subgroups and normal subgroups.
6. Demonstrate understanding of the importance of homomorphism and isomorphism in groups.



# REAL ANALYSIS

Semester : V

SUBJECT CODE:.....Core Course: VIII

Instruction Hours/Week:5

Credit: 5

## Course Objectives:

1. To Study the Concepts of Functions and real number system
2. To Understand the Continuous functions in Metric Spaces
3. To Know the Derivatives and their properties

## UNIT I

**Real Numbers:** Field axioms-Order in  $\mathbf{R}$ -Absolute value-Completeness-Some important subsets of  $\mathbf{R}$  Countable and uncountable sets.

## UNIT II

**Neighbourhood and limit points:** Neighbourhood -open sets-Closed sets-Limit point of a set-Closure of a set-Interior of a set - Compactness- Connectedness.

## UNIT III

**Limits and Continuity:** Limits (definitions only)-Continuous functions-Types of discontinuities-Algebra of continuous functions-Boundedness of continuous functions -Intermediate value theorem- Inverse function theorem-Uniform continuity.

## UNIT IV

**Derivatives:** Derivability and continuity- Algebra of derivatives- Inverse function theorem for derivatives-Darboux's theorem.

## UNIT V

**Mean value theorems:** Rolle's theorem-Lagrange's Mean value theorem-Cauchy's Mean value theorem-Taylor's theorem- Taylor's series- Power series expansions of some standard functions.

## Text Book

M.K.Singal & Asha Rani Singal, A first Course in Real Analysis, R.Chand & Co., 2012 edition.

**UNIT I: Chapter 1- Sections 1,2,4-7,10.**

**UNIT II: Chapter 2- Sections 1-9**

**UNIT III: Chapter 5- Sections 1-8.**

**UNIT IV: Chapter 6- Sections 1-5.**

**UNIT V: Chapter 8- Sections 1-6**

## Reference(s):

1. Gold Berge, Richard R, Methods of Real Analysis, Oxford & IBHP Publishing Co., New Delhi, 1970.

## Course Outcomes:

1. Basic Concepts of Functions and real number system
2. Concepts of Limits
3. Concepts of Metric Spaces.
4. Understanding of Continuous functions in Metric Spaces
5. Introduction and Properties of Riemann Integral
6. Derivatives and their properties

# STATICS

Semester: V                      SUBJECT CODE:.....  
Instruction Hours/Week: 6

Core Course: XI  
Credit: 5

## Course Objectives:

1. To Understand Laws of Forces and their properties.
2. To Study the concepts of Friction and Strings.

## UNIT I

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

## UNIT II

Forces on a rigid body-Moment-Equivalent systems of forces-Parallel forces – Varignon's Theorem-Forces along a Triangle-Couples-Resultant of several coplanar forces.

## UNIT III

Friction-Laws of Friction – Coefficient of Friction, Angle & Cone of Friction-Limiting equilibrium of a particle on a rough inclined plane, Tilting of a body – Simple Problems.

## UNIT IV

Virtual work-Principle of Virtual work-Simple Problems.

## UNIT V

Hanging strings-Equilibrium of Strings under gravity-Common Catenary-Suspension bridge.

## TEXT BOOK(S)

P.Duraipandiyan, Mechanics (Vector Treatment), S.Chand & Co., June 1997

**UNIT I - Chapter 2 & Chapter 3 section 3.1**

**UNIT II - Chapter 4 section 4.1, 4.3 to 4.7**

**UNIT III - Chapter 2 section 2.1, Chapter 3 section 3.2, Chapter 5 section 5.2**

**UNIT IV - Chapter 8**

**UNIT V - Chapter 9**

## REFERENCE(S)

1. M.K.Venkataraman, Statics, Agasthiyar Publications, 2002
2. A.V.Dharmapadham, Statics, S.Viswanathan Publishers Pvt Ltd, 1979
3. S.L.Lony, Elements of Statics and Dynamics, Part I, A.I.T.Publishers, 1991.

## Course Outcomes:

1. Laws of Forces and their properties.
2. Concepts of Moments and Couples.
3. Equilibrium of Forces
4. Friction laws and its properties
5. Application to real life problems
6. Catenary and its properties

# THEORY OF TRANSFORMS

Semester : VI

SUBJECT CODE:.....Core Course: XII

Instruction Hours/Week:6

Credit: 6

## Course Objectives:

1. To Understand the Concepts Transforms.
2. To Study Inverse Laplace Transform Solving ODE.

### UNIT I

Laplace Transforms – properties of Laplace Transforms -  $L[f(t)]$  –  $L[f(t)/t]$  Models – Problems using shifting property – Laplace Transform of periodic functions – problems.

### UNIT II

Inverse Laplace Transforms - Solving ODE with constant coefficient by using Laplace Transforms.

### UNIT III

Fourier integral theorem – Fourier Transform Pair-sine and cosine transforms – properties – Transforms of simple functions –convolution theorem – Parse Val's Identity.

### UNIT IV

Z transforms – Definition – Z Transforms of standard functions – shifting theorems I & II – Initial value theorem – final value theorem – shift property – convolution theorem

### UNIT V

Inverse Z transforms – long division method – Partial fraction method - inverse integral method & related problems – differentiation – applications to solve finite difference equations

## TEXT BOOK

1. Calculus - Vol. III - S.Narayanan & T.K.Maicavachagam Pillay, S.Viswanathan Publishers, Delhi-2010.
2. Dr.P.Kandasamy & Dr. K. Thilagavathy – Engineering Mathematics –volume III, S.Chand & Co.,2008.

**UNIT I : Chapter 5 section 1 to 5 of [1]**

**UNIT II : Chapter 5 section 6 to 10 of [1]**

**UNIT III : Chapter 4 of [2]( page 273 to 305)**

**UNIT IV : Chapter 5 of [2]( page 371 to 397)**

**UNIT V : Chapter 5 of [2]( page 398 to 411)**

## Reference(s):

1. Integral Transforms by A.R.Vasishtha and Dr.R.K.Gupta –KRISHNA Prakashan MEDIA (p) Ltd.,
2. Grewel B.S., ‘Higher Engineering Mathematics’ 40th edition, Khanna Publishers, Delhi-2007.
3. M.K.Venkataraman”Engineering Mathematics” ,S.V.Publication Volume 3 Revised Edn.

**Course Outcomes:**

- 1. To Understand the Concepts of Laplace Transforms.**
- 2. Knowledge of Inverse Laplace Transform Solving ODE.**
- 3. To Understand the Concepts of Fourier Transform.**
- 4. To Understand the Concept of Z Transform.**
- 5. To Understand the applications Inverse Z Transform.**



## DYNAMICS

Semester : VI            SUBJECT CODE:.....

Core Course: XIV

Instruction Hours/Week: 6

Credit: 6

Course Outcomes:

1. To Study the Behavior of motion of objects.
2. To Understand the Behaviour of elastic bodies in real life problems.
3. To Understand the Concepts of Moment of Inertia and Its Applications.

### UNIT I

Kinematics Velocity – Relative Velocity - Acceleration – Coplanar Motion -components of Velocity & Acceleration – Newton’s Laws of Motion.

### UNIT II

Projectile – Forces on a projectile-Projectile projected on an inclined plane-Enveloping parabola or bounding parabola.

### UNIT III

Impulsive force – conversion of linear momentum – Impact of a sphere & a plane - Direct & Oblique Impact of two smooth spheres –Kinetic energy and Impulse.

### UNIT IV

General orbits-Central orbit-Conic as a central orbit-Kepler’s laws of planetary motion.

### UNIT V

Moment of Inertia of simple bodies –Theorems of Parallel and Perpendicular axes.

### TEXT BOOK(S)

[1] P.Duraipandiyan, Vector Treatment as in Mechanics, S.Chand & Co. –June 2009 Edition .

UNIT – I -Chapter 1 & Chapter 2 Sections 2.1, 2.1.1

UNIT – II -Chapter 13

UNIT – III -Chapter 14

UNIT –IV -Chapter 16

UNIT – V -Chapter 17

### REFERENCE(S)

[1] M.K.Venkataraman, Dynamics, Agasthiar Book Depot, 1990.

[2] A.V.Dharmapadam, Dynamics, S. Viswanathan Publishers, 1981

Course Outcomes:

1. Behavior of motion of objects.
2. Applications of Projectile in practical problems.
3. Behaviour of elastic bodies in real life problems.
4. Simple Harmonic Motion and its Applications.
5. To Understand the Concepts of Central Orbit.
6. To Understand the Concepts of Moment of Inertia and Its Applications.

## NUMERICAL METHODS

Semester : VI

SUBJECT CODE:.....Core Course: XV

Instruction Hours/Week: 6

Credit: 6

### Course Objectives:

1. To introduce the System of Linear Algebraic equations.
2. To Understand the Problem solving techniques in Numerical methods.

### UNIT I

Different methods to find the solutions of algebraic and transcendental equations-The Bisection method – The Iteration method – The method of False Position – Newton-Raphson method – Generalized Newton's method.

### UNIT II

Finite Differences – Forward differences – Backward differences – central differences – symbolic relations and separation of symbols – Newton's forward and backward difference formula – Lagrange's interpolation formula – Newton's interpolation divided difference formula.

### UNIT III

Numerical Differentiation: Newton's forward and backward difference formula – Numerical Integration: Trapezoidal rule – Simpson's rule (1/3 and 3/8).

### UNIT IV

Solutions to linear systems-direct methods and indirect methods-Gaussian Elimination method-Gauss Method to find the Inverse-Method of factorisation-Iterative Methods.

### UNIT V

Numerical solution of ordinary differential equations-Taylor series method-Picard's method-Euler's method - Euler's modified method – Runge – Kutta method-Adams-Moulton method-Milne's method(Only Problems).

### TEXT BOOK:

S.S.Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Private Limited, 2010.

**UNIT I - Chapter 2: Section 2.1, 2.2, 2.3-2.3.1, 2.4, and 2.5 – 2.5.1**

**UNIT II - Chapter 3: Section 3.3-3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.6, 3.9.1 - 3.10.1**

**UNIT III – Chapter 5: Section 5.1, 5.2, 5.4-5.4.1, 5.4.2, 5.4.3**

**UNIT IV – Chapter 6: Section 6.3-6.3.2, 6.3.3, 6.3.4, 6.4,**

**UNIT V - Chapter 7: Section 7.1, 7.2, 7.3, 7.4-7.4.2, 7.5, 7.6-7.6.1, 7.6.2**

### REFERENCE(S):

1. S.Narayanan & Others, Numerical Analysis, S.Viswanathan Publishers, 1994.
2. A.Singaravelu, Numerical Methods, Meenachi Agency, June 2000.

**Course Outcomes:**

- 1. To study the method of Transcendental and polynomial equations.**
- 2. To introduce the System of Linear Algebraic equations.**
- 3. To study the method of Interpolation and Approximation.**
- 4. Knowledge of Differentiation and Integration through the numerical methods..**
- 5. Problem solving techniques in Numerical methods.**
- 6. To Understand the method to solve the Differential equation through Numerical methods**



# MATHEMATICAL STATISTICS – I

**Semester : III**

**SUBJECT CODE:.....**

**Second Allied Course: I**

**Instruction Hours/Week: 4**

**Credit: 3**

## **Course Objectives:**

- 1. To study the Measure of Dispersion**
- 2. To Understand the basic concepts of Expectation.**
- 3. To Study the Theoretical Distributions.**

## **UNIT I**

Measures of Dispersion: Range –Quartile Deviation –Mean Deviation- Standard Deviation- Coefficients of Dispersion –Coefficients of Skewness and Kurtosis –Problems.

## **UNIT II**

Theory of Probability-Definition of Probability-Sample Space – Probability of an event – Independence of events –Theorems on Probability-Conditional Probability –Baye's Theorem.

## **UNIT III**

chebychev's inequality and weak law of large numbers – Simple form of Central limit theorem for i.i.d random variables.

## **UNIT IV**

Random variables –Distribution function –Discrete and continuous Random variables – Probability mass and density functions –Joint Probability Distribution function –Moments – Expectation –Variance – Covariance –Moment Generating function –Theorems on moment generating function.

## **UNIT V**

Theoretical Distributions: Binomial , Poisson and Geometric Distributions –MGF of these Distributions –Additive properties – Recurrence relations for the moments about origin and mean –Relation between Binomial and Poisson Distributions – Fitting of Binomial and Poisson Distributions.

## **TEXTBOOK(S)**

Gupta S.C and Kapoor V.K, Fundamentals of Mathematical Statistics, Sulthan Chand and Sons, New Delhi – 2002 edition.

**UNIT I - Chapter 2 sections 2.12 to 2.16 (except 2.15)**

**UNIT II - Chapter 3 sections 3.3 to 3.5, 3.8 to 3.15, Chapter 4 section 4.2**

**UNIT III - Chapter 7sections 7.5 to 7.7, Chapter 9 section 9.13**

**UNIT IV - Chapter 5 sections 5.1 to 5.5, Chapter 6 sections 6.2 to 6.6, Chapter 7 section7.1**

**UNIT V - Chapter 8 sections 8.4 ,8.5,8.7**

## **Course Outcomes**

- \* History and Introduction of Probability.**
- \* Concepts of Random Variables and Distributions**
- \* Properties of Mathematical Expectations**
- \* Standard Distributions**
- \* Knowledge of moment generating functions**
- \* Applications to real life problems.**
- \* Basic Concepts of Expectation**
- \* Knowledge of discrete distribution**

## MATHEMATICAL STATISTICS II

Semester : III & IV

SUBJECT CODE:.....Second Allied Course: II

Instruction Hours/Week:3&3

Credit: 3

### Course Objectives:

1. To Study the Quartile, Mean and Standard Deviation.
2. To Understand the Knowledge of Discrete and Continuous Distribution.
3. To Understand the Knowledge of test of Significance.

### UNIT I

Quartile deviation, Mean Deviation, Standard deviation and co-efficient of variation.  
Calculation of moments. and Pearson's and Bowley's co-efficient of Skewness.

### UNIT II

Calculation of mean deviation, standard deviation for discrete probability distributions, marginal and conditional expectations, covariance and correlation for bivariate discrete probability distributions.

### UNIT III

Fitting of binomial, Poission and normal distributions (Area method only).

### UNIT IV

Curve fitting: Linear, quadratic and exponential; correlation and regression lines.

### UNIT V

Internal estimation and tests of significance based on normal and 't' distributions for mean, correlation and proportion, tests of significance based on chisquare and F distribution of variance. Tests for goodness of fit and independence of attributes.

### Text Book

Fundamental of Mathematical Statistics-S.C.Gupta, V.K.Kapoor.

**UNIT I - Chapter 2 : sections 2.13 to 2.14 (except 2.15)**

**UNIT II - Chapter 2**

**UNIT III – Chapter 8: sections 8.4-8.5 , Chapter 9 section 9.2**

**UNIT IV - Chapter 10: sections 10.1 to 10.7**

**UNIT V - Chapter 16: sections 16.1 to 16.7**

### Reference(s):

(Course II & III)

1. Mood A.M.Graybill, F.A. and Boes, O.C.-Introduction to theory of statistics, McGraw Hill (1974)
2. Hogg.R.V. and Craig, A.T-Introduction to Mathematical statistics, Colliar Macmillan, 1978-4th Edition.
3. Raghatgi,U.K-An introduction of probability theory and Mathematical statistics, Wiley Eastern 1984.

**Course Outcomes:**

- 1. To Knowledge the Quartile, Mean and Standard Deviation.**
- 2. To Knowledge the Discrete and Continuous Distribution**
- 3. Basic concepts of Sampling and testing of Hypothesis.**
- 4. Testing of Hypothesis for real life problems.**
- 5. Testing of Hypothesis for small samples**
- 6. Knowledge about various types of Large Samples**
- 7. Concepts of Correlation and rank correlation coefficient**
- 8. Practical Knowledge of Correlation and Rank Correlation Coefficient**

## MATHEMATICAL STATISTICS III

Semester : IV                      SUBJECT CODE:.....  
Instruction Hours/Week:5

Second Allied Course: III  
Credit: 3

### Course Objectives:

1. To study the Basic concepts of Sampling and testing of Hypothesis.
2. To Understand the Practical Knowledge of Correlation and Rank Correlation Coefficient.

### UNIT I

Normal distribution – constant, m.g.f, binomial, poisson, and chisquare distribution tending to normal, statement of central limit theorem. Characteristics functions and its properties. Statement of uniqueness theorem and continuity.

### UNIT II

Continuous distributions – rectangular, Exponential, Beta, Gamma Distributions.

### UNIT III

Sampling distributions, ‘t’, ‘F’ and chisquare distributions.

### UNIT IV

Correlation – Rank Correlation, Karl pearson’s Correlation coefficient and its properties. Linear Regression and its properties.

### UNIT V

Internal Estimation. Test of Hypothesis – Null and alternative hypothesis (concept only) one tail and two tail test, test of significance based on normal and ‘t’ distribution for mean, simple correlation and proportion – Test of significance based on chisquare and F Distribution for variance, test for goodness of fit and independence of attributes.

### TEXTBOOK

Gupta S.C and Kapoor V.K, Fundamentals of Mathematical Statistics, Sulthan Chand and Sons, New Delhi – 2002 edition.

### Reference(s):

1. Mood A.M., Graybill F.A, and Boes O.c. – Introduction to theory of Statistics, McGraw Hill (1974)
2. Hogg R.V. and Craig, A.t. – Introduction of Mathematical Statistics, Colliar Macmillan, 1978 – 4th Edition.
3. Gupta S.C. and Kapoor, V.K. – Fundamentals of Mathematical Statistics, Sultan Chand and Sons.

## **Course Outcomes**

- 1.To Knowledge the Quartile,Mean and Standard Deviation.**
- 2.To Knowledge the Discrete and Continuous Distribution**
- 3.Basic concepts of Sampling and testing of Hypothesis.**
- 4.Testing of Hypothesis for real life problems.**
- 5.Testing of Hypothesis for small samples**
- 6.Knowledge about various types of Large Samples**
- 7.Concepts of Correlation and rank correlation coefficient**
- 8.Practical Knowledge of Correlation and Rank Correlation Coefficient**

# OPERATIONS RESEARCH

**Semester: V**

**SUBJECT CODE:.....**

**Major Based Elective – I**

**Instruction Hours/Week: 5**

**Credit:4**

## **Course Objectives:**

**1.To Study the Basis of Linear Programming problem.**

**2.To Understand the knowledge of Network Problem.**

(In all the Units No Book Work need to be proved – Only applications of the Book works need to be taught)

## **UNIT I**

Introduction to Operations Research – Elementary treatment of Linear Programming – Simplex Method for  $<$ ,  $=$ ,  $>$  constraints.

## **UNIT II**

Application to Transportation problem – Transportation algorithm – Degeneracy algorithm – Degeneracy in Transportation Problem, Unbalanced transportation problem – Assignment algorithm – Unbalanced Assignment problem.

## **UNIT III**

Sequencing : Introduction-Sequence for  $n$  Jobs on 2 machines – Processing  $n$  Jobs on 3 machines – Processing  $n$  Jobs on  $m$  machines. Replacement Models.

## **UNIT IV**

PERT CPM network – Critical & sub Critical jobs – Determining the Critical Path – Network Calculation of PERT networks – Probability of PERT.

## **UNIT V**

Inventory theory – Variables in an inventory problem – Techniques of Inventory Control with known demand.

[1] Purchasing Model with No shortage

[2] Purchasing Model with shortage

[3] Manufacturing Model with No shortage

[4] Manufacturing Model with Shortage

## **TEXT BOOK(S)**

[1] Kanti Swaroop, Gupta.P.K & Manmohan, Operations Research, Sultan Chand & Co.

**UNIT-I - Chapter 0 sections 0.1 to 0.9., Chapter 2 Sections 2.1 to 2.5,  
Chapter 3 Sections 3.1 to 3.4, 3.8**

**UNIT –II - Chapter 9 Sections 9.1 to 9.9 & Chapter 10 Sections 10.1 to 10.3**

**UNIT-III - Chapter 16 Sections 16.1 to 16.4 & Chapter 18 Sections 18.1 to 18.3**

**UNIT –IV - Chapter 20 Sections 20.1 to 20.8**

**UNIT – V - Chapter 17 Sections 17.1, 17.2, 17.4 to 17.6, 17.8, 17.9**

**REFERENCE(S)**

[1] Hamdy A. Taha, Operations Research (7th Edn.), Prentice Hall of India, 2002.

[2] Richard Bronson, Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1982.

**Course Outcomes:**

- 1. Learning Linear Programming Problems.**
- 2. Obtaining Optimal Solutions.**
- 3. Increasing the effectiveness of Management decisions**
- 4. Implementing Long Range Plans to solve problems**
- 5. Quantitative Analysis of decisions**
- 6. Learning Logical Analysis**





**Course Outcomes:**

- 1. Understanding the definition of Automation.**
- 2. Introducing the different types of Grammar.**
- 3. Constructing the Regular Expressions.**
- 4. Trained to know the normal forms.**
- 5. Studying Pumping lemma for regular sets.**
- 6. Simplifying context free grammars.**

# ASTRONOMY

Semester: V      SUBJECT CODE:..... Major Based Elective Course: II  
Instruction Hours/Week:5      Credit: 4

## Course Objectives:

1. To Understand the Knowledge of astronomy to the students.
2. To study the Time , Seasons, Years and Calendar.

## UNIT I

Relevant properties of a sphere & relevant formulae in spherical trigonometry (All with out proof) – Celestial sphere – Diurnal motion.

## UNIT II

Earth-Dip of the horizon – Astronomical refraction – Tangent & Cosine's formula – Properties & Simple problems applying them.

## UNIT III

Geocentric parallax - Kepler's Laws of Planetary motion (statement only) – Three anomalies of the Earth and relation between them

## UNIT IV

Time , Seasons, Years and Calendar & Simple problems – Heliocentric parallax - Aberration of light

## UNIT V

Moon – Motions of Planet - Eclipses

Note: All the units includes worked out problems only, **not exercise problems**

## TEXT BOOK(S)

1. S.Kumaravelu and Prof.Susheela Kumaravelu, Astronomy, SKV Publication, 2004

**UNIT I - Chapters 1 (Statements only), Chapter 2 – sections 39 to 83**

**UNIT II - Chapters 3 Sections 5 & 6 , Chapters 4 sections 117 to 120, 129,130**

**UNIT III - Chapters 5 sections 135 to 137, Chapter 6**

**UNIT IV - Chapters 7 Sections 166 to 170, 172 ,173,175 to 179, Chapter 8 sections 190 to 192, Chapter 9 sections 195 to 197**

**UNIT V – Chapter 12 sections 229 to 241,250, Chapter 13 sections 256 to 270, Chapter 14, sections 285 to 289,292 to 295**

## REFERENCE (S)

1. V.Thiruvengkatacharya, A Text Book of Astronomy, S.Chand and Co., Pvt Ltd., 1972.

## Course Outcomes:

1. Introducing the exciting world of astronomy to the students.
2. Helping the students to study about the celestial objects.
3. Understanding the effects of refractions geocentric parallax.
4. Compiling solar and lunar ellipses.
5. Understanding Kepler's laws of planetary motion.
6. Understanding the variation in duration of day and night in various zones of earth.

# DISCRETE MATHEMATICS

Semester: V

SUBJECT CODE:.....

Major Based Elective : II

Instruction Hours/Week: 5

Credit: 4

## Course Objectives:

1. To Understand the Concepts of Mathematical Logic
2. To Understand the Concepts of Theory of inference and Predicate calculus.

## UNIT I

Mathematical Logic- Introduction- Statements and Notations- Connectives-Normal forms.

## UNIT II

The Theory of inference- Predicate calculus –Inference theory of predicate calculus.

## UNIT III

Set theory – Introduction- Basic concepts of set theory- Operation on sets- Relations and ordering.

## UNIT IV

Functions– Definition and Introduction – Composition of Functions – Inverse functions- Characteristics function of a set- Hashing function.

## UNIT V

Partially Ordered Sets – Lattice – Lattice as Algebraic System –Some Properties of Lattices – Boolean algebra.

## TEXT BOOK(S)

J.P.Trembly and R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill book Co., 1997.

**UNIT I: ChapterI:Sections 1.1 to 1.3**

**UNIT II: ChapterI:Sections 1.4 to 1.6**

**UNIT III: ChapterII: Sections 2.1 to 2.3**

**UNIT IV: ChapterII: Sections 2.4 to 2.6**

**UNIT V: ChapterIV: Sections 4.1 to 4.3**

## REFERENCE(S)

1. J.E.Hopcroft and J.D.Willman, Introduction to Automata Theory, Nicosia publishing House.
2. C.L.Liu, Elements of Discrete Mathematics, McGraw-hill Book Co., 1986.

## Course Outcomes:

- 1.To Understand the Concepts of Mathematical Logic
- 2.To Understand the Concepts of Theory of inference and Predicate calculus.
- 3.To Knowledge the Set theory.
- 4.To Knowledge the Sets on Operations.
5. To Understand the Concepts of Lattices and Boolean Algebra.



**Course Outcomes:**

- 1. Introduction to Graphs.**
- 2. Concept of Eulerian graphs**
- 3. Concept of Hamiltonian graphs**
- 4. To Understand the Concepts of Planar graph.**
- 5. Applications of graph theory.**
- 6. Relation between Matrices and Graph Theory.**

# STOCHASTIC PROCESSES

Semester : VI      SUBJECT CODE:.....  
Instruction Hours/Week:5

Major Based Elective – III  
Credit: 3

## Course Objectives:

1. To motivate matrix analysis and in particular Laplace Transformation are the ones which are widely used as mathematical models of systems and phenomena that appear to vary in a random manner.
2. To study Stochastic processes with discrete and continuous state space, renewal processes in continuous time models.

## 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 behavior.

## 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 – Mutti channel models – Bulk Queues.

## TEXT BOOK:

Scope and treatment as in “Stochastic Process” by J. Medhi, Chapters 1, 2, 3 (omitting 3.6,3.7 & 3.8), 4(omitting 4.5 and 4.6) and Chapter 10 (omitting 10.6, 10.7)

## Reference(s):

1. First course in Stochastic Process by Samuel Kartin.
2. Stochastic Process by Srinivasan and Metha (TATA Mc Graw Hill)
3. Elements of Applied Stochastic Process by V. Narayanan.

## Course Outcomes:

- 1.To Study the Laplace Transforms.
- 2.To Understand Stochastic process & stationary process.
3. To Study the stability of Markov system.
4. To understand Poisson process and related distributions.
5. To understand Stochastic process in queuing model.

## QUANTITATIVE APTITUDE I

**Semester: IV**      **SUBJECT CODE:.....**      **Non Major Elective Course: I**  
**Instruction Hours/Week: 2**      **Credit:2**

### **Course Objectives:**

- 1. To Motivate Problem solving techniques for aptitude problems.**
- 2. To improve and learn basic Mathematics skills.**

### **Unit I**

Numbers-HCF-LCM-Problem on numbers.

### **Unit II**

Decimal Fractions and Simplification (chapter 3 & 4).

### **Unit III**

Surds and Indices - Percentage - Profit and Loss.

### **Unit IV**

Ratio and Proportion – Partnership – Allegation or Mixture (Chapters 12, 13 & 20).

### **Unit V**

Average – Problems on Age (Chapters 6 & 8)

### **Text Book:**

Scope and treatment as in “ Quantitative Aptitude “ by R.S.Aggarwal, S.Chand & Company ltd., Ram Nagar, New Delhi (2007).

### **Course Outcomes:**

- 1. Problem solving techniques for aptitude problems.**
- 2. Prepare themselves for various competitive examinations.**
- 3. Applications of simple formulae**
- 4. Acquaintance to various elementary concepts**
- 5. Acquaintance to shortcut methods**
- 6. To improve and learn basic mathematics skills.**





**ALLIED MATHEMATICS**  
**For Physics, Chemistry, Geology (2016-19)**  
**Algebra, Calculus and Differential Equations – U19AMS1**

**Semester** : I  
**Instruction Hours/Week** : 5

**First Allied Course** : I  
**Credit** : 3

**Unit I**

Characteristic roots of a square matrix - Evaluation of Eigen values and Eigen vectors - Verification of Cayley – Hamilton Theorem.

**Unit II**

Leibnitz's theorem (statement only) for the  $n^{\text{th}}$  derivative of a product of functions – Applications - Curvature and radius of curvature in Cartesian Co-ordinates .

**Unit III**

General properties of definite integrals (without proof) and problems using these properties - Reduction formula for  $\int e^{ax} x^n dx$ ,  $\int \sin^n x dx$ ,  $\int \cos^n x dx$ , where  $n$  is a positive integer- Evaluation of

$$\int_0^{\infty} e^{-ax} x^n dx, \int_0^{\pi/2} \sin^n x dx, \int_0^{\pi/2} \cos^n x dx \text{ where } n \text{ is a positive integer.}$$

**Unit IV**

Equation of First order not of First degree Equation solvable for  $dy/dx$ . Equation solvable for  $y$ - Equation solvable for  $x$ .(Simple problems only)- Clairaut's form (Simple case only).

**Unit V**

Formation of partial Differential equations by elimination of constants and arbitrary function- Definition of general, Particular and complete solution of partial differential equations- singular integral(Geometrical meaning not expected) solution of first order equations in their standard forms.  $F(p_1,q)=0$ ,  $F(x_1p_1q)=0$ ,  $F(y_1p_1q)=0$ ,  $F(z_1p_1q)=0$ ,  $F_1(x_1p)=F_2(y_1q)$ ,  $Z=p_x+q_y+f(p_1q)$ .

**Text Books**

1. T.K. Manickavasagam Pillai, T.Natarajan & K.S.Ganapathy, Algebra ( Vol. II), S. Viswanathan Pvt.Ltd, Reprint, 2004 (Unit I).
2. S. Narayanan & T. K. Manickavasagam Pillay, Calculus (Vol. I), S. Viswanathan printers and publishers , Reprint 2003(Unit II ).
3. S. Narayanan & T. K. Manickavasagam Pillay, Calculus (Vol. II), S. Viswanathan printers and publishers, Reprint 2003(Units III ).
4. S,Narayanan&T.K.Manickavasagam Pillay, Calculus (Vol.III ), S.Viswanathan Pvt.Ltd Reprint, 2004 (Units IV&V).

Unit I Chapter 2 §16

Unit II Chapter 3 § 2.1,2.2 & Chapter 10§ 2.1,2.2,2.3,2.4

Unit III Chapter 1 § 4, 11, 13.1, 13.3, 13.4

Unit IV Chapter 1 § 5, 5.1, 5.2, 5.3, 5.4, 6.2

Unit V Chapter 4 §1, 2, 2.1, 2.2, 3, 5, 5.1, 5.2, 5.3, 5.4

## ALLIED MATHEMATICS

### Vector Calculus & Analytical Geometry of Three Dimensions - U19AMS2

<b>Semester</b>	<b>: I &amp; II</b>	<b>First Allied Course</b>	<b>: II</b>
<b>Instruction Hours/Week</b>	<b>: 3 &amp; 3</b>	<b>Credit</b>	<b>: 3</b>

#### Unit I

Vector Differentiation – Vector differential operator ( $\nabla$ ), Gradient, Directional derivatives unit normal vector to the surface, divergence, solenoidal vector, Curl, irrotational vector, vector identities.

#### Unit II

Vector integration – line integral – surface integral – volume integral

#### Unit III

Gauss divergence theorem (statement only) verification and application – Green's theorem (statement only) and applications - Stoke's theorem (statement only), verification and application.

#### Unit IV

Straight line- equation of a straight line – condition for a straight line to lie on a given plane – condition for coplanarity - shortest distance between two straight lines.

#### Unit V

Sphere – Standard equation – Length of the tangent from any point – Equation of a tangent plane – condition for the plane to touch the sphere- Intersection of a plane and a sphere - Intersection of two spheres – Equation of a sphere passing through a given circle.

#### Text Books

1. K. Viswanathan and S. Selvaraj, Vector Analysis, Emerald Publishers, Chennai, 1999 (Units I, II & III).
2. S.Narayanan, R.Hanumantha Rao, T.K.Manickavasagam Pillay and P.Kandasamy, Ancillary Mathematics, Vol. IV, S.Viswanathan printers and publishers Pvt. Ltd., 1996 (Units IV & V).

Unit I Chapter 2 (except §2.2.5)

Unit II Chapter 3 § 3.2 – 3.7

Unit III Chapter 4 § 4.2 - 4.4

Unit IV Chapter 3 (Pages 70 - 85)

Unit V Chapter 4 (Pages 86 - 99)

**Trigonometry, Laplace Transforms & Fourier Series - U19AMS3**

**Semester : II**  
**Instruction Hours/Week : 5**

**First Allied Course : III**  
**Credit : 3**

**Unit I**

Expansion of  $\cos n\theta$ ,  $\sin n\theta$  and  $\tan n\theta$  ( $n$  is a positive integer) – Related problems – Expansion of  $\cos \theta$ ,  $\sin \theta$  in terms of  $\theta$  - Expansion of  $\cos^n \theta$ ,  $\sin^n \theta$  in a series of sines and cosines of multiples of  $\theta$ , given in radians (proof not required) and simple problems.

**Unit II**

Euler's formula for  $e^{i\theta}$ . Definition of hyperbolic functions – relation between the circular and hyperbolic functions – Formula involving hyperbolic functions – Expansion of  $\sinh x$  and  $\cosh x$  in power of  $x$ . Inverse hyperbolic functions  $\sinh^{-1}x$ ,  $\cosh^{-1}x$  and  $\tanh^{-1}x$  in terms of logarithmic functions separation into real and imaginary parts of  $\sin(x + iy)$ ,  $\cos(x + iy)$ ,  $\tan(x + iy)$ ,  $\sinh(x + iy)$ ,  $\cosh(x + iy)$  and  $\tanh(x + iy)$ ,  $\tan^{-1}(x+iy)$

**Unit III**

Definition – Laplace transform of functions  $e^{at}$ ,  $\cos at$ ,  $\sin at$  and  $t^n$  where  $n$  is a positive integer. First shifting theorem – Laplace transform of  $e^{-at} f(t)$  is  $\phi(s + a)$  – Laplace transform of  $e^{-at} \cos bt$ ,  $e^{-at} \sin bt$  and  $e^{-at} f(t)$  – Laplace transform of  $f'(t)$  and  $f''(t)$ .

**Unit IV**

Inverse Laplace transform relating to the standard forms – Application to the solution of ordinary differential equations with constant coefficients involving the above transformations.

**Unit V :**

Definition of Fourier series – Finding Fourier coefficients for a given periodic function with period  $2\pi$  (odd and even function) – Half range series.

**Text Books**

1. S. Narayanan, T. K. Manickavasagam Pillai, Trigonometry, S. Viswanathan Pvt. Ltd., Reprint 2004, (Units I, II).
2. S. Narayanan, T. K. Manickavasagam Pillai, Calculus Volume III, S.Viswanathan Pvt. Ltd, Reprint 2004, (Units III, IV & V)
  - Unit I Chapter 3 § 1, 2 (pg. 61-68), 4, 4.1, 5
  - Unit II Chapter 4 § 1, 2, 2.1, 2.2, 2.3
  - Unit III Chapter 5 § 1, 2, 4
  - Unit IV Chapter 5 § 6, 7, 8
  - Unit V Chapter 6 § 2, 3, 3.1, 3.2, 4

**Allied-I: Mathematics – I**  
**For candidates admitted from 2019-2020 onwards**  
**(B.Sc Computer Science , IT and B.C.A )**

**Semester : I**  
**Instruction Hours/Week : 5**

**Code : U19AMS1C**  
**Credit : 3**

**UNIT-I**

Algebraic and Transcendental equations: Finding the root of the equation using Bisection method, Newton Raphson method, Iteration method, Method of false position.(problems only)

**UNIT-II**

Finite differences-forward, backward differences-Newton's forward and backward difference interpolation formulae. Lagrange's interpolating polynomial.(problems only)

**UNIT-III**

Measures of Central Tendency - Measures of Dispersion - Moments and Measures of Skewness and Kurtosis.

**UNIT-IV**

Theory of Probability - Definitions of Probability - Sample Space - Probability of an Event - Independence of Events - Theorems on Probability - Conditional Probability - Baye's Theorem.

**UNIT-V**

Correlation and Regression - Properties of Correlation and Regression Coefficients - Numerical Problems for Finding the Correlation and Regression Coefficients.

**Text Books:**

1. Introductory Methods of Numerical Analysis, S.S.Sastry, fourth edition, 2010, PHI(P)Ltd.
2. Business Statistics, P.R.Vittal, 2001, Margham Publication.

**Unit I** : Book 1 : Chapter 2 - Sec 2.1-2.5

**Unit II** : Book 1: Chapter 3 - Sec 3.3.1,3.3.2,3.6,3.9.1

**Unit III** : Book 2: Chapter 5 - Page no.50-84,Chapter - 6,7

**Unit IV** : Book 2: Chapter 14 -Page no.370-408

**Unit V** : Book 2: Chapter 8 -Page no.177-223, Chapter 9 - Page no.224-255

**Allied-II: Mathematics – II**  
**For candidates admitted from 2019-2020 onwards**  
**(B.Sc Computer Science , IT and B.C.A )**

**Semester : I & II**  
**Instruction Hours/Week : 5**

**Code : U19AMS2C**  
**Credit : 3**

**Unit I**

Operations Research: Introduction-Basics of OR-Linear Programming formulations & graphical solution of two variables – Canonical & standard forms of LPP. Simple Method: Simplex Method for  $\leq$  constraints only.

**Unit II**

Transportation problem: Finding the IBFS by North West corner rule, Least cost method, VAM method. Optimal solution by MODI method – Degeneracy in Transportation Problem, Unbalanced transportation problem and Maximization problem.

**Unit III**

Assignment algorithm – Balanced assignment problem- Unbalanced assignment problem, travelling salesman problem. Game theory – introduction- saddle point (with and without)-mixed Strategy.

**Unit IV**

Sequencing problem: Processing of n jobs through two machines – Processing of n jobs through 3 machines- processing of two jobs through m machines.

**Unit V**

Networks: Network – Fulkerson's rule – measure of activity – PERT computation – CPM computation- Resource scheduling.

**TEXT BOOK(S)**

1. Man Mohan & Gupta , Operations Research, Sultan Chand Publishers, New Delhi

**Unit I** : Chapter 2 - Sec 2.1,2.2 ,Chapter 3 - Sec 3.1-3.5 ,Chapter 4 - Sec 4.3

**Unit II** : Chapter 5 - Sec 5.1-5.3,5.7,5.9 ,Chapter 10 - Sec10.1-10.3,10.9,10.12,10.14

**Unit III** : Chapter 11 - Sec 11.1-11.4,11.6 ,Chapter 17 - Sec 17.1-17.5

**Unit IV** : Chapter 21 - Sec 21.1,21.7

**Unit V** : Chapter 12 - Sec12.1-12.6

**REFERENCE(S)**

1. Prem Kumar Gupta and D.S. Hira, Operations Research: An Introduction, S.Chand and Co., Ltd. New Delhi,
2. Hamdy A.Taha, Operations Research (7<sup>th</sup>Edn.),McMillan Publishing company, New Delhi, 1982.

**Allied-III: Mathematics – III**  
**For candidates admitted from 2019-2020 onwards**  
**(B.Sc Computer Science , IT and B.C.A )**

**Semester** : II  
**Instruction Hours/Week** : 5

**Code** : U19AMS3C  
**Credit** : 3

**UNIT – I**

Integration - Integrals of functions containing linear functions of x -Integrals of functions involving  $a^2+x^2$ -  
integrals of rational algebraic functions - Integration of irrational functions.

**UNIT – II**

Properties of definite integrals- Simple applications - Integration by parts - Bernoulli's formula.

**UNIT – III**

Differential equations of first order - Variable separable -Homogeneous equations – Non homogeneous  
equations - Linear equation -Bernoulli's equation.

**UNIT – IV**

Second order Linear equations with constant co-efficient – Particular integrals for  $e^{kx}$ ,  $\sin kx$ ,  $\cos kx$ ,  $x^n$  and  
 $e^{kx}X$ .

**UNIT – V**

Laplace transform - Definition - Some general theorems – Inverse Transform.

**Text Book:**

1. Ancillary Mathematics, Vol-II (2009), S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagam Pillay, Kandaswamy.
2. Calculus, volume III, S. Narayanan, , T.K. Manicavachagam Pillay.

**Unit I** : Book 1: Chapter 1 - Sec 6.1, 6.2, 7 (Omit 7.4), 8 case (i and ii)only  
Page no: 7-13, 23-31, 39-45.

**Unit II** : Book 1: Chapter 1 - Sec. 11, 12, 1  
Page no: 61-72, 93, 94.

**Unit III** : Book 1: Chapter 4 - Sec 1-5  
Page no: 205-218.

**Unit IV** :Book 2: Chapter 2  
Page no.49-74

**Unit V** : Book 1: Chapter 7 - Sec 7.1, 7.2, 7.3, 7.4, 7.5  
Page no: 289-308.



**BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI- 620 024**

**ENVIRONMENTAL STUDIES – U19ES**

**(Applicable to the candidates admitted from the Academic year 2019-20 onwards)**

- 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**

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.
  - III-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](mailto: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%20Rules,%202004.pdf>.

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**SEMESTER – II**

**COURSE CODE: U19SBE1**

**HOURS: 2**

**CREDITS: 2**

**OFFICE AUTOMATION**

**UNIT I:**

MS- Word- Introduction to Computers - Hardware - Software, Operating System: Windows XP -MS-Paint, Notepad, WordPad, Introduction to MS-Word, Creating, Editing and Formatting Document - Working with Drawing objects - Text Manipulation

**UNIT II:**

Working with Tables – Columns – Labels - Plotting, editing and Filling drawing objects - Bookmark – Header & Footer - Checking and Correcting a document - Creating Labels – Envelops – Mail Merge – Formatted output and Report generation Printing Documents, Working with Internet.

**UNIT III:**

Ms – Excel - Ms – Excel: Introduction – Data Entry – Cell Formatting - Plotting Graphs – Workbook Features – Library Functions

**UNIT IV:**

Conditional Functions and Data Sorting – Limit the data on a worksheet - Data Validation –Data consolidation - Chart creation - Checking and Correcting Data - Tracking and Managing Changes- Advanced Features

**UNIT V:**

MS – PowerPoint- Introduction - Creating, Editing and Formatting Presentation – Applying Transition and Animation Effects - Applying Design Templates - Viewing and Setting up a Slide Show - Navigating among Different Views - Ms Outlook: Introduction to Folder List – Address Book.

**TEXTBOOKS**

1. Jill Murphy, Microsoft Office Word- Comprehensive Course, Labyrinth Publications, 2003.
2. McGraw-Hill/Irwin-Deborah Hinkle, Microsoft Office 2003 PowerPoint: A Professional Approach, Comprehensive w/ Student CD, New Delhi, 2003.
3. Nellai Kannan, C., MS-Office, Nels Publications, Tamil Nadu, 2002.

**SEMESTER – III**

**COURSE CODE: U19SBE2**

**HOURS: 2**

**CREDITS: 2**

## **DESKTOP PUBLISHING**

### **UNIT I:**

Photoshop Tools : Move, Type, Marquee, Lasso, Crop, Shapes, Healing, Brush, Patch, Cloning Stamp, Eraser, Gradient, Blur, Smudge, Dodge, Pen, Eye Dropper, Patch selection and Zoom tool.

Layer: New layer, Layer set, Duplicate layer, Rasterize and Merge down

Layer Styles: Drop shadow, inner shadow, outer glow & inner glow, Bevel and Emboss, Gradient overlay, Stroke. Text formatting

### **UNIT II:**

File: Save, File formats, Page set up.

Edit: Check spelling, Copy merged, Fill, Transform, Define pattern.

Image: Motion blur, Twirl, lens flare, Glowing edges, lighting effects, solarize, water paper, Stained glass, Mosaic Tiles.

Window: Character and Paragraph settings.

### **COREL DRAW:**

#### **UNIT III:**

Drawing Tools: Pick, Shape, Knife, eraser, Smudge, Roughen brush, free transform, Zoom ,hand, Free hand, Bezier, Artistic, Pen, Poly line, Point, Interactive connective, Spiral tool.

Colour Tool: Paint Bucket Tool, Eye Dropper, Fill Tools. Fill Options, Stroke Options.

#### **UNIT IV:**

Special Effects: 3D effects, Add perspective, Blend, Contour, Artistic media, lens, and Power clip.

Shaping Options: Weld, trim, Intersect.

Text Effects: Format text, bullet, and fit text to path, align and straighten, spell check.

File Menu: Save, Save as, Import, Page set Up.

### **PAGE MAKER:**

#### **UNIT V:**

Page Maker Tools: Pointer, Rotate, Line, Rectangle, Ellipse, Polygon, Hand, Text, Crop, Rectangle frame tools. Text layout, Style and Objects: Alignments, Styles, fill, frame options, Stroke, Group, Lock, unlock, mask, polygon settings character and paragraph settings.

Text Editing: Edit story: Undo, Redo, Cut, Copy, Paste, paste Special, Spelling check and Find.

**File:** Page set up, save, Save as.

### **TEXTBOOKS**

1. CorelDraw IN Simple Steps – Shalini Gupta Corel DRAW Bible - DEBORAH MILLER
2. Teach Yourself Adobe Photoshop – Rose Carla Adobe Photoshop Cs Classroom in a Book by Adobe Press.
3. Using Microsoft Word - Asmita Bhatt Pagemaker In Easy Steps - Scott Basham Ctoa Material By Genesis.

**SEMESTER – III**

**COURSE CODE: U19SBE3P**

**HOURS: 2**

**CREDITS: 2**

**OFFICE AUTOMATION & DESKTOP PUBLISHING LAB**

**UNIT I:**

**Office Automation**

1. MS – Word: Text Formatting, Mail Merge
2. Ms – Excel: Implement the Statistical & Mathematical Function  
( Using Min ,Max, Median, Average, Standard Deviation, Correlation, Logical 'if' Condition ) for the given data.

Prepare a Chart for a given Data using Pie diagram / Histogram

**UNIT II:**

**Photoshop**

3. Design a College Brochure / Birthday Card.
4. Cropping, rotating and Overlapping the image.
5. Create a single image from Multiple image.
6. Creating an image with multilayer's.

**UNIT III:**

**Corel Draw**

7. Design a Visiting Card \ Greeting Card using Draw & Text tools.
8. Create a logo for a Company \ College.

**UNIT IV:**

**Page Maker**

9. Type and format a letter using text tool.
10. Prepare a Invitation for College Day /Sports Day.

## PART – IV: VALUE EDUCATION - U19VE

**HOURS: 2**

**CREDITS: 2**

### Learning Objectives

This subject deals with the

- Philosophy of life
- Individual qualities
- social values
- Mind culture
- Personal health.

### UNIT I:

PHILOSOPHY OF LIFE Human Life on Earth ( Kural 629), Purpose of Life ( Kural 46) Meaning and Philosophy of Life( Kural 131, 226) The Law of Nature (Kural 374) Glorifying All form of Life in this Universe (Kural 322, 327) – Protecting Nature /Universe (Kural 16, 20, 1038)

### UNIT II:

INDIVIDUAL QUALITIES Basic Culture (Kural 72, 431) Thought Analysis (Kural 282, 467,666) Regulating desire (Kural 367), Guarding against anger (Kural 158, 305, 306, 314), To get rid of Anxiety (Kural 629), The Rewards of Blessing (Kural 3), Benevolence of Friendship (Kural 786), Love and Charity (Kural 76), Self – tranquility/Peace (Kural 318)

### UNIT III:

SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE) Family (Kural 45), Peace in Family (Kural 1025), Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807), The Pride of Womanhood (Kural 56) 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), Thriftness (Thrift)/Economics (Kural 754), Health (Kural 298), Education (Kural 400), Governance (Kural 691), People’s responsibility/ duties of the community (Kural 37), World peace (Kural 572)

### UNIT IV:

MIND CULTURE Mind Culture (Kural 457) Life and Mind - Bio - magnetism, Universal Magnetism (God – Realization and Self Realization) - Genetic Centre – Thought Action – Short term Memory – Expansiveness – Thought – Waves, Channelising the Mind, Stages - Meditation (Kural 261, 266, 270), Spiritual Value (Kural 423)

### UNIT V:

TENDING PERSONAL HEALTH Structure of the body, the three forces of the body, life body relation, natural causes and unnatural causes for diseases (Kural 941), Methods in Curing diseases (Kural 948, 949) The Five units, simple physical exercises.



## **LEARNING OUTCOMES:**

On successful completion of the course, the students should have acquired knowledge over

- Philosophy of life
- Individual qualities
- social values
- Mind culture
- Personal health

## **TEXTBOOKS**

1. Philosophy of Universal Magnetism (Bio-magnetism, Universal Magnetism) The World Community Service Centre Vethatri Publications (for Unit IV)
2. Pope, G.U., Dr. Rev., Thirukkural with English Translation, Uma Publication, 156, Serfoji Nagar,  
Medical College Road, Thanjavur 613004 (for All Units)
3. Value Education for Health, Happiness and Harmony, The World Community Service Centre Vethatri Publications (for All Units)

## PART – IV: SOFT SKILLS - U19SS

**HOURS: 2**

**CREDITS: 2**

### **Learning Objectives**

This subject deals with knowledge of understanding

- Interpersonal skills
- Communicative skills
- Corporate skills
- Resume Writing.

### **LEARNING OUTCOMES:**

On successful completion of the course, the students should have acquired knowledge over

- Interpersonal skills
- Communicative skills
- Corporate skills
- Resume Writing.

### **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 emails-e mail etiquette

### **UNIT IV:**

Corporate Skills/ Working with Others Developing body language –Practising etiquette and mannerism – Time management – Stress management.

### **UNIT V:**

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

### **TEXT BOOKS**

1. Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success) P.R. Publishers & Distributors, No, B-20 &21, V.M.M Complex, Chatiram Bus Stand, Tiruchirapalli -620 002. (Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 7442) Alex K. (2012)
2. Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi - 110 055. Mobile No: 94425 14814(Dr.K.Alex)

### **REFERENCE BOOKS**

1. Developing the leader within you John C Maxwell
2. Good to Great by Jim Collins
3. The Seven habits of highly effective people Stephen Covey
4. Emotional Intelligence Daniel Goleman
5. You can Win Shive Khera

Principle centred leadership Stephen Covey

**SEMESTER – VI**

**COURSE CODE: U19GS**

**PART – V: GENDER STUDIES**

**HOURS: 1**

**CREDITS: 1**

**Learning Objectives**

This subject deals with

- Concept of gender,
- Women's Studies vs Gender Studies,
- Areas of Gender Discrimination,
- Women development and Gender Empowerment

**LEARNING OUTCOMES:**

On successful completion of the course, the students should have acquired knowledge over

- Concept of gender Women's Studies vs Gender Studies Areas of Gender Discrimination
- Women development and Gender Empowerment

**UNIT I:**

Concepts of Gender: Sex-Gender-Biological Determinism- Patriarchy- Feminism -Gender Discrimination -Gender Division of Labour -Gender Stereotyping-Gender Sensitivity - Gender Equity —Equality-Gender Mainstreaming Empowerment

**UNIT II:**

Women's Studies Vs Gender Studies: UGC's Guidelines - VII to XI Plans- Gender Studies: Beijing Conference and CEDAW-Exclusiveness and Inclusiveness.

**UNIT III:**

Areas of Gender Discrimination: Family Sex Ratio-Literacy -Health -Governance Religion Work Vs Employment- Market - Media - Politics Law Domestic Violence — Sexual Harassment — State Policies and Planning

**UNIT IV:**

Women Development and Gender Empowerment: Initiatives International Women's Decade - International Women's Year - National Policy for Empowerment of Women - Women Empowerment Year 2001- Mainstreaming Global Policies.

**UNIT V:**

Women's Movements and Safeguarding Mechanism:— In India National / State Commission for Women (NCW) - All Women Police Station Family Court- Domestic Violence Act - Prevention of Sexual Harassment at Work Place Supreme Court Guidelines - Maternity Benefit Act - PNDT Act - Hindu Succession Act 2003 Eve Teasing Prevention Act - Self Help Groups 73 and 74 Amendment for PRIS.

**TEXTBOOKS**

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. Pernau Margrit Ahmad Imtiaz, Reifeld Hermut (ed.,) Family and Gender: Changing Values in Germany and India, New Delhi: Sage Publications, 2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.,)
6. Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi: Oxford University Press, 2006
7. Rajadurai.S.V, Geetha.V, Themes in Caste Gender and Religion, Tiruchirappalli: Bharathidasan University, 2007 Misra Geetanjali, Chandiramani Radhika (ed.,)
8. Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi: Sage Publication, 2005 Rao Anupama (ed.,)
9. Gender &Caste: Issues in Contemporary Indian Feminism, New Delhi: Kali for Women, 2003
10. Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publications, 2003
11. Krishna Sumi,(ed.,) Livelihood and Gender Equity in Community Resource Management New Delhi: Sage Publication, 2004
12. Wharton .S Amy, The Sociology of Gender: An Introduction to Theory and Research, USA: Blackwell Publishing, 2005.
13. Mohanty Manoranjan (ed.,) Class, Caste, Gender: Readings in Indian Government and Politics- 5, New Delhi: Sage Publications, 2004.
14. Arya Sadhna, Women, Gender Equality and the State, New Delhi: Deep & Deep Publications, 2000.