

Applicable to the candidates admitted from the academic year 2019-2020 onwards

Scheme of Examination

Semester	Part	Course Title	Title	Instr. Hours/week	Credit	Exam Hours	Marks			Total	
							Internal	Ext			
								Oral	W		
I	I	Language Course-I (U19T1/ U19H1/ U19S1)		6	3	3	25		75	100	
	II	English Language Course-I (U19E1)		6	3	3	25		75	100	
	III		Core Course - I (U19GY1)	The Dynamic Earth	5	5	3	25		75	100
			Core Course - II (U19GY2P)	Practical I - Structural Geology Surveying	3	-	-	-	-	-	-
			First Allied Course-I (U191AC 1)		5	3	3	25		75	100
		First Allied Course - II (U191AC 2)		3		***	-		-	-	
	IV	Environmental Studies (U19ES)		2	2	3	25		75	100	
		Total		30	16					500	
II	I	Language Course-II (U19T2/ U19H2/ U19S2)		6	3	3	25		75	100	
	II		English Language Course - II (U19E2)	4	2	3	25		75	100	
			Communicative English - I (U19CE1)	2	1	3	25	5	70	100	
	III		Core Course - II (U19GY2P)	Practical I - Structural Geology & Surveying	3	6	3	25	5	70	100
			Core Course - III (U19GY3)	Structural Geology	5	5	3	25		75	100
			First Allied Course - II (U191AC 2)		3	3	3	25	5	70	100
		First Allied Course - III (U191AC 3)		5	3	3	25		75	100	
IV	Skill Based Elective-I (U19SBE1)	Office Automation	2	2	3	25		75	100		
		Total		30	25					800	
III	I	Language Course - III (U19T3/ U19H3/ U19S3)		6	3	3	25		75	100	
	II	English Language Course-IV (U19E3)		6	3	3	25		75	100	
	III		Core Course - IV (U19GY4)	Palaeontology	4	4	3	25		75	100
			Core Course - V (U19GY5P)	Practical II - Palaeontology & Crystallography	3	-	-	-	-	-	-
			Second Allied Course-I (U192AC 1)		4	3	3	25		75	100
		Second Allied Course - II (U192AC 2)		3	-	*	-			-	
	IV		Skill Based Elective Course II (U19SBE2)	Desk Top Publishing	2	2	3	25		75	100
		Skill Based Elective Course III (U19SBE3P)	Practical - Office Automation & Desk Top Publishing	2	2	3	25		75	100	
		Total		30	17					600	

IV	I	Language Course – IV (U19T4/ U19H4/ U19S4)		6	3	3	25		75	100
	II	English Language Course– IV (U19CE2)		4	2	3	25		75	100
		Communicative English – II (U19CE2)		2	1	3	25		75	100
	III	Core Course – V (U19GY5P)	Practical II – Palaeontology & Crystallography	2	5	3	25	5	70	100
		Core Course – VI (U19GY6)	Crystallography	4	4	3	25		75	100
		Second Allied Course – II (U192AC 2)		3	3	3	25	5	70	100
		Second Allied Course – III (U192AC 3)		5	3	3	25		75	100
	IV	Non Major Elective Course– I (U19NME1)	Elements of geology	2	2	3	25		75	100
		Value Education Course – (U19 VE)		2	2	3	25		75	100
	Total		30	25					900	
V	III	Core Course – VII (U19GY7)	Indian Stratigraphy	5	5	3	25		75	100
		Core Course – VIII (U19GY8)	Mineralogy	5	5	3	25		75	100
		Elective Course – I (U19GY9E)	Mineral Prospecting & Mining Geology	5	4	3	25		75	100
			Gemmology							
		Elective Course – II (U19GY10E)	Hydrogeology & Environmental Geology	5	4	3	25		75	100
	Disaster Management									
	Core Course – IX (U19GY11P)	Practical III – Mineralogy, Hydrogeology & Mining Geology	6	5	3	25	5	70	100	
IV	Non Major Elective Course II (U19NME2)	Geology & Environment	2	2	3	25		75	100	
	Soft Skills (U19SS)		2	2	3	25		75	100	
	Total		30	27					700	
VI	III	Core Course X (U19GY12P)	Practical IV - Petrology, Economic Geology	6	6	3	25	5	70	100
		Core Course XI (U19GY13)	Igneous & Metamorphic Petrology	6	6	3	25		75	100
		Core Course – XII (U19GY14)	Sedimentary Petrology & Marine Geology	6	6	3	25		75	100
		Core Course– XIII (U19GY15)	Economic Geology	6	6	3	25		75	100
		Elective Course III (U19GY16E)	Remote Sensing and Engineering Geology	5	4	3	25		75	100
	GIS and GPS									
	V	Gender Studies Course (U19GS)		1	1	3	25		75	100
Extension Activities			--	1	--	--	--	--	--	
	Total		30	30					600	
	Total		180	140					4100	

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 பிரியதர்னி |

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 - நன்றுடையான தீயதிலானை.
திருநாவுக்கரசர் - தில்லைப் பெருங்கோயில் - கருநட்ட கண்டனை.
கந்தரர் - 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
காசீப் புலவர் - முனாஜாத்தூப் 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 மஞ்ஞை அறையின் முட்டை - கபிலர் - குறிஞ்சி
4. வினையே ஆடவர்க்குயிரே வாணுதல் - பாலை பாடிய பெருங்கடுங்கோ - பாலை
5. ஆர்கலி ஏற்றொடு கார்தலை மணந்த - ஓக்கூர் மாசாத்தியார் - முல்லை

அலகு - 2:

அகநானூறு - (3 பாடல்கள் - 40, 48, 53)

1. கானல் மாலைக் கழிப்புக் 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 - செல்வாயாம் 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 - 20x1 = 20

பகுதி ஆ - 5 - 5x5 = 25

பகுதி இ - 5 - 3x10 = 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.

ENGLISH FOR COMMUNICATION – U19E1

Semester: I

English Language Course I

Instruction Hours/Week: 6

Credit: 3

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 – hundreth prince
7. The mouse Merchand

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

ENGLISH THROUGH EXTENSIVE READING – U19E2

SEMESTER : II

INSTRUCTION HOURS/WEEK : 4

ENGLISH LANGUAGE COURSE : II

CREDIT : 2

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.

READING POETRY AND DRAMA – U19E4

Page | 13

SEMESTER : IV

ENGLISH LANGUAGE COURSE : IV

INSTRUCTION HOURS/WEEK : 6

CREDIT : 2

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

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

U19H1 : 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 wider knowledge of Hindi literature. The learners will understand various genres 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 – Jagdesh 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 koon (Sumitranandan Pant)
3. Kiloni (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 kovoona - 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.
- 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)

LANGUAGE COURSE PART I SANSKRIT SEMESTER I PAPER I SANSKRIT I

(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), पिब, पठ, क्रीड, 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, सत्वरम्, 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 (० 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(पिब),
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
2. क्रियापदानि (लट् लकारे)
 - १। अट्, भक्ष्, अर्च्, खेल्, चल्, धार्, कथ्, क्षाल्, पाल्, तुल्, मार्, घर्ष्, तोष्, गण्, ।
3. कृषि-संबन्धीनि पदानि
 - १। कृषीवलः इति पाठः।
 - २। नूतन-क्रियापदानि -क्री, वि-क्री, सिच्, रुह्, वर्ष्, रुह्, रच्, निस्ज्-कस्, वस्, कृष्, मुच् ।
4. आकारान्त-स्त्रीलिङ्गः
 - १। आकारान्तः स्त्रीलिङ्गः माला शब्दः
 - २। समानान्त-पदानि।
 - ३। पदानां वाक्येषु उपयोगः
5. सन्धिः (स्वरः)
 - १। सवर्णदीर्घ-सन्धिः
 - २। गुणसन्धिः
 - ३। वृद्धिसन्धिः
 - ४। सन्धीनां वाक्येषु उपयोगः
 - ५। सन्धीनां अभ्यासः

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

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

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

Lesson 10 and Lesson 12: Full)

References: Samskrita Bodhini (Prathama), Samskrita 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

गतषाणमासे 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, रक्ष्, हस्, वम्, नम्, दह्, तप्, वस्,
इच्छ्, वाञ्छ्, शस्, 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 (लृट् क्रियापदानि)

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

२। संवादः - अभ्यासः

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 ।

3

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

Page | 34

- 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. Angala-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 स्त्रीलिङ्गे
- ४। अनुवाद-अभ्यासः
- ५। हिमालयः - रचनालेखनम्

Unit II

- १। ओकारान्तः स्त्रीलिङ्गः गो शब्दः
- २। गो-संबन्धीनि पदनि
- 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 हनुमान् 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, धित्तूर, आन्ध्रप्रदेशः ५१७५०१।

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
I	U19GY1	THE DYNAMIC EARTH	5	25	75	100

The objectives of the course are

- To impart knowledge on the subject of Geology and its branches, origin of Solar system, formation of the Earth and its various spheres, features of continents and oceans, elements in the Earth, outline of minerals and rocks and a brief history of the Earth
- To impart knowledge on the structure and composition of the Earth's interior, internal temperature, Earth's gravitational and magnetic fields, salient aspects of continental drift, sea floor spreading and plate tectonics
- To impart knowledge on various aspects of earthquakes, volcanism, orogeny, mountain belts, age determination of rocks and, past views and present estimation of age of the Earth
- To impart knowledge on basic concepts of the study of landforms, weathering process, fluvial landforms, drainage patterns, landforms formed by groundwater and, about lakes
- To impart knowledge on the processes and landforms related to the action of glaciers, wind, coastal process, an account on coral reefs, structural landforms and major landforms of India

Unit 1: Geology: Importance and branches – Solar System: components, important theories of its origin – Earth: shape and size – Outline of primary geochemical differentiation – Salient features of Earth's atmosphere, hydrosphere, biosphere and lithosphere – Continents and Oceans, their important features – Elements in the Earth, crustal abundance of elements, rock cycle – Outline of the geological history of the Earth.

Unit 2: Earth's internal structure and composition – Concept of isostasy – Outline on Earth's internal temperature, geothermal gradient, heat flow variations – Outline of Earth's gravitational field and magnetic field – Continental drift: Wegener's hypothesis, evidences and objections – Sea floor spreading: Hess's concept and evidences – Plate tectonics: types of plate boundaries, evidences for plate movement, characteristic features of plate boundaries, driving forces of plate motion

Unit 3: Earthquakes: causes, types of seismic waves, effects, earthquake belts, expression of earthquake strength, seismic zones of India – Volcanism: causes, products, effects, volcanic belts, types of eruption and volcanic landforms – Orogeny, orogenic cycles, epeirogeny – Mountain belts: their characteristics, size, alignments, age – Time and Geology: principles used for the determination of relative and absolute time – Age of the Earth: outline on past and present views

Unit 4: Basic concepts of the study of landforms – Application of the study of landforms – Weathering: types and products – Fluvial landforms: factors affecting stream erosion and deposition, fluvial erosional and depositional landforms – Drainage patterns – Landforms formed due to the action of groundwater – Lakes: types of lakes and lake deposits.

Unit 5: Glacial landforms: formation, distribution and types of glaciers, glacial erosional and depositional landforms – Erosional and depositional landforms formed due to wind – Coastal erosional and depositional landforms – Coral reefs: importance, types and distribution – Structurally controlled landforms – Major landforms of India

Text Books

1. Dayal, P (2010). A Text Book of Geomorphology. Rajesh Publications, New Delhi
2. Kale, V and A. Gupta (2010). Introduction to Geomorphology, Universities Press, Hyderabad
3. Mahapatra, G.B (2016). Text Book of Physical Geology. CBS Publishers and Distributors Pvt. Ltd., New Delhi
4. Patwardhan, A.M (2010). The Dynamic Earth System, II Edition, PHI Learning Private Ltd., New Delhi
5. Roy, A.B (2010). Fundamentals of Geology. Narosa Publishing House Pvt. Ltd., New Delhi
6. Savindra Singh (2018). Geomorphology, Pravalika Publications, Allahabad
7. Thornbury, W.D (1969). Principles of Geomorphology, Revised II Edition, 2015 Reprint, New Age International Pvt. Ltd. Publishers, New Delhi

Reference Books

1. Chernicoff, S and H.A. Fox (2000). Essentials of Geology. Houghton Mifflin Company, New York
2. Cesare Emiliani (1997). Planet Earth. Cambridge University Press, Cambridge
3. Carlson D.H and C.C. Plummer (2009). Physical Geology: Earth Revealed, McGraw-Hill, New York
4. Christiansen, E.H and W. K. Hamblin (2014). The Dynamic Earth. Jones and Bartlett Publishers, Inc., New York

Course Outcomes

At the end of the course

- The student would have gained sufficient knowledge about the subject of Geology and its branches, origin of Solar system, various spheres, continents and oceans, outline of elements, minerals, rocks in the Earth, and a preliminary knowledge on the Earth's history
- The student would have gained sufficient knowledge about the Earth's interior, internal temperature, Earth's gravitational and magnetic fields, salient aspects of continental drift, sea floor spreading and plate tectonics
- The student would have gained sufficient knowledge on various aspects of earthquakes, volcanism, orogeny, mountain belts, age determination of rocks and, past views and present estimation of age of the Earth
- The student would have gained sufficient knowledge on basic concepts of the study of landforms, weathering process, fluvial landforms, drainage patterns, landforms formed by groundwater and, about lakes
- The student would have gained sufficient knowledge on To impart knowledge on the processes and landforms related to the action of glaciers, wind, coastal process, an account on coral reefs, structural landforms and major landforms of India

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
II	U19GY2P	PRACTICAL I –STRUCTURAL GEOLOGY SURVEYING	5	25	75	100

Course Objectives

- To impart knowledge on Survey of India Toposheets and its uses.
- To impart practical knowledge on the contour maps and their interpretation
- To solve problems mathematically related to structural geology
- To familiarize the use of survey instruments in the field

Cartographic Appreciation of Survey of India (SOI) Topographic Sheets: Description of features in SOI's toposheet: extramarginal, marginal, intramarginal information, major conventional signs and symbols, physical and socio-cultural features.

Contour maps and their interpretation: Exercises to predict trends of the outcrop of horizontal, vertical and inclined beds with respect to topography – Reading of solid conformable maps – Deciphering dip and strike of outcrops – Construction of map when three points over a bedding plane are given - Construction of vertical sections, thickness and order of superposition – Reading of solid fold and fault maps – Construction of vertical sections – Determination of throw of vertical faults – Reading of unconformable solid maps and construction of sections - Reading of solid maps of areas when more than one structure is involved – Determination of comparative ages of structures and intrusions – Deciphering geological history.

Structural Geology Problems: Problems relating to true dip and apparent dip – Determination of vertical and true thickness.

Surveying: Procedure for Chain survey – Determination of distance between two far off objects with the given known distance using Plane-table survey and Compass survey methods – Leveling measurements (fly level and measurement of various heights of stations with respect to bench mark) using Dumpy level & Auto level. Clinometer & Brunton compass: determination of dip and strike of the beds.

Course Outcomes

After the completion of the course the student will be able to

- Interpret simple and complex geological maps
- Understand and solve problems relating to depth, thickness, three point problem using trigonometric principles
- Perform surveying using surveying instruments and able to prepare maps.

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
II	U19GY3	STRUCTURAL GEOLOGY	5	25	75	100

Course Objectives

The course aims to

- impart familiarity on the basics of Structural Geology
- understand the basic concepts of stress, strain and deformation.
- acquaint with the primary structures of rocks
- get familiar with geological structures such as Folds, Faults, Joints, Unconformities.
- gain knowledge on rock fabrics.

Unit I: Basic concepts of Structural Geology:

Topographic maps – Contour maps – Methods of representing physiographic and structural features in map – Mechanism and uses of Clinometer and Brunton compass – Beds and their attitudes: strike, true dip and apparent dip, relation between strike and dip – Outcrops and trends of outcrop: Rule of V of outcrops, width of outcrops, true thickness, vertical thickness and their mutual relations – Outline on stereographic and equal area projections – Petrofabric diagrams

Unit II: Basic concepts of deformation:

Force, stress, strain and deformation – Stress and strain, and their types – Hooke's law and behaviour of materials on deformation: elastic, plastic and brittle – Behavior of rocks under deformation: brittle and ductile deformation – Stress and strain ellipsoids.

Unit III: Primary structures of rocks:

Primary structures of intrusive igneous rocks: Concordant forms - sill, laccolith, lopolith and phacolith: Discordant forms – dykes, cone sheets, volcanic neck, ring dyke, batholiths, stocks, bosses and psymaliths – Primary structures of extrusive igneous rocks: lava flows, volcanoes, crater and caldera – Primary structures of sedimentary rocks: bed, ripple marks, current bedding, cross bedding, graded bedding, mud cracks, rain prints and channeling – Brief study of salt domes.

Unit IV: Ductile Structures:

Folds: geometry, description, classification of folds, recognition of folds in the field and map – Foliation and lineation: cleavage and its types, lineation and its types – Unconformities: types, significance, recognition of unconformities in field and map – Outline on overlap, offlap, inlier and outlier.

Unit V: Brittle Structures:

Faults: nomenclature, genetic and geometric classification, recognition of fault in field and map – Distinction between faults and unconformities – Shear zone: origin and types – Short account of rift valleys – Joints: geometric and genetic classification and uses of joints – Short note on window, nappe, klippe, autochton, allochton, imbricate structure.

Text Books:

1. Billings M.P. Structural Geology: Prentice Hall, Englewood Cliffs, U.S.A,
2. Ghosh, S. K. 1993 Structural Geology: Fundamental and Modern Developments, Pergamon Press.
3. Gokhale, N.W. 1996 Theory of Structural Geology, CBS Publishers.

References:

1. De Sitter, U. 1956 Structural Geology, McGraw Hill.
2. Fossen, H. 2010: Structural Geology, Cambridge University Press:
3. Pollard, D. D. and Fletcher, R. C. 2005 Fundamentals of Structural Geology, Cambridge University Press.
4. Park, P.G. 1994, Fundamentals of structural Geology, John Willey & sons, Canada.
5. Ragan, D. M. 2009 Structural Geology - An Introduction to Geometrical Techniques (Fourth Edition), Cambridge University Press.
6. Ramsay, J. G., 1967 Folding and fracturing of Rocks. McGraw Hill.
7. Rowland, S. M. Duebendorfer, E. M. and Schiefelbein, I. M. 2007 Structural Analysis and Synthesis: Laboratory Course in Structural Geology, 3rd Edition, Wiley-Blackwell.

Course outcomes:

After the completion of the course the student will be

- able to prepare and interpret the contour maps and topographic maps
- explain the mechanism of rocks deformation
- identify the geological structure and recognize them in the field as well as map
- familiar with the use of Clinometer compass and Brunton compass

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
III	U19GY4	PALAEONTOLOGY	4	25	75	100

Course Objectives:

To impart knowledge on

- Origin of life and its evolution through geological time, classification of organism
- Fossils, their types & applications, conditions for formation & modes of preservation of fossils
- General morphology, classification, geologic history and stratigraphic importance of trilobites, graptolites, brachiopods, pelecypods, gastropods and cephalopods
- General morphology, classification, geologic history and stratigraphic importance of corals, echinoids, crinoids, blastoids, and important invertebrate, vertebrate and plant fossils of India

Unit 1: Palaeontology and its branches – Classification of living organism: hierarchy of the classification, binomial nomenclature, species concept - Origin of life and major steps in the evolution of life through geological time – Fossils: Conditions for the formation of fossils and fossilization processes – Modes of preservation of fossils: Body fossils, unaltered hard parts, and altered hard parts (petrification, permineralisation, carbonisation, recrystallisation, impression, moulds and casts) and trace fossils - Microfossils and their types – Uses of fossils in stratigraphy, correlation, evolution studies, paleoenvironment, paleoclimate, paleogeography, exploring economic deposits.

Unit 2: Foraminifera: general morphology, classification, geological history and stratigraphic importance – Trilobites: general morphology, classification, geological history and stratigraphic importance – Graptolites: general morphology, classification, geological history and stratigraphic importance.

Unit 3: Pelecypoda: general morphology, classification and geological history – Types of dentition in Pelecypoda – Gastropoda: General morphology, classification and geological history – Different forms of gastropod shell – Cephalopoda: general morphology, classification and geological history – Types of suture patterns in Cephalopoda and stratigraphic importance of ammonoides.

Unit 4: Corals: general morphology, classification, geological history and stratigraphic importance – Brachiopods: general morphology, geological history and stratigraphic importance, differences between Articulata and Inarticulata – Echinodermata: general morphology and geological history of Echinoidea, Crinoidea and Blastoidea.

Unit 5: Short account on the following plant fossils: Glossopteris, Gangamopteris, Ptilophyllum, Calamites, Lepidodendron and Sigillaria – Gondwana flora and their stratigraphic significance – Short account on the following Vertebrate fossils: Devonian fishes, Mesozoic reptiles and Cenozoic mammals.

Text Books

1. Clarkson, Euan and N.K. Clarkson (1998). *Invertebrate Palaeontology & Evolution*, Wiley-Blackwell.
2. Doyle Peter (1996). *Understanding Fossils: An Introduction to Invertebrate Palaeontology*, John Wiley & Sons Ltd.
3. Jain P.C and M.S. Anatharaman (2018). *An Introduction to Paleontology*, Vishal Publications

4. Raup, D.M and S.M. Stanley (1985). *Principles of Paleontology*, CBS Publications
5. Sreepat Jain (2017). *Fundamentals of Invertebrate Palaeontology*, Springer
6. Woods, H (1959). *Invertebrate Palaeontology*, Cambridge.

Reference Books

1. Arnold, C.A (1947). *An Introduction to Palaeobotany*, McgGraw-Hill Book Company, Inc.
2. Benton, M. J (2015). *Vertebrate Palaeontology and Evolution (IV Edition)*, Wiley-Blackwell.
3. Easton W. H (1960). *Invertebrate Paleontology*, Harper's Geoscience Series.
4. Hag, B.U and A. Boersma (1978). *Introduction to Marine Micropalaeontology*. Elsevier, Netherlands, 376 P.
5. Moore R.C., Lalieker, C.D and A.G. Fischer (1952). *Invertebrate Fossils*, McGraw Hill.
6. Reed Wicander and James S. Monroe (2007). *Historical Geology: Evolution of Earth and Life Through Time (VI Edition)*
7. Romer A.S (1960). *Vertebrate Palaeontology*, Chicago press.
8. Shrock, R.R and W.H. Twenhofel (1953). *Principles of Invertebrate Palaeontology*, Arnold Publication

Course Objectives:

On completion of the course the students would have acquired a comprehensive knowledge on

- Origin of life and its evolution through geological time, classification of organism
- Fossils, their types & applications, conditions for formation & modes of preservation of fossils
- General morphology, classification, geologic history and stratigraphic importance of trilobites, graptolites, brachiopods, pelecypods, gastropods and cephalopods
- General morphology, classification, geologic history and stratigraphic importance of corals, echinoids, crinoids, blastoids, and important invertebrate, vertebrate and plant fossils of India.

Sem	Course Code	Course Title	Credit	Marks			
				I	E	O	T
IV	U19GY5P	PRACTICAL II – PALAEONTOLOGY & CRYSTALLOGRAPHY	5	25	70	5	100

Course Objectives

To impart knowledge on

- the identification of selected fossils (based on the study of their characteristics) of corals, brachiopods, echinoderms, pelecypods, gastropods, cephalopods, trilobites and, plant fossils
- the identification of selected crystal models and twin crystal models, based on the study of their characteristics

1. Palaeontology

a. Identification and description of the following fossils:

- **Corals:** Calceola, Zaphrenits, Favosites, Halysites, Lithostrotion
- **Brachiopoda:** Spirifer, Productus, Terebratula, Rhynconella, Atrypa, Athyris
- **Echinodermata:** Pentrimites, Cidaris, Hemicidaris, Stygmatothygus, Micraster, Holaster
- **Mollusca: Pelecypoda:** Arca, Cardium, Meretrix, Cardita, Pecten, Trigonina, Pholodomya, Gryphea, Exogyra, Ostrea, Alectryonia
- **Gasteropoda:** Natica, Turbo, Trochus, Turritella, Cerethium, Conus, Voluta, Fusus, Murex, Physa, Bellerophon.
- **Cephalopoda:** Nautilus, Goniatites, Ceratites, Acanthoceras, Scholenbachia, Perispinctus, Scaphites, Baculites, Turritites and Belemnites,
- **Arthropoda: Trilobita:** Paradoxides, Calymene, Phacops, Trinucleus
- **Graptolites:** Tetragraptus, Didymograptus, Monograptus.
- **Plant fossils:** Glossopteris, Gangamopteris, Ptillophyllum, Lepidodendron, Sigillaria and Calamites.

b. Diagrams of selected fossils

- Calymene, Paradoxides, Pentrimites, Arca, Meretrix, Murex, Turritella, Nautilus, Spirifer, Ptillophyllum

2. Crystallography

a. Identification and description of the following crystal models:

- Galena, Garnet, Fluorite, Pyrite, Tetrahedrite, Boracite, Sphalerite, Cuprite, Zircon, Cassiterite, Rutile, Octahedrite, Apophyllite, Vesuvianite, Scheelite, Meonite, Wulfenite, Chalcocopyrite, Beryl, Zincite, Apatite, Calcite, Haematite, Dolomite, Corundum, Tourmaline, Phenacite, Diopside, Quartz, Olivine, Topaz, Barite, Andalusite, Cordierite, Sulphur, Staurolite, Hypersthene, Calamine, Struvite, Epsomite, Gypsum, Orthoclase, Augite, Hornblende, Epidote, Spinel, Axinite, Albite, Kyanite and Rhodonite.

b. Identification and description of the following twin crystal models:

- Galena, Fluorite, Pyrite, Rutile, Calcite, Quartz, Staurolite, Gypsum, Augite, Orthoclase, Albite.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- the identification of selected fossils (based on the study of their characteristics) of corals, brachiopods, echinoderms, pelecypods, gastropods, cephalopods, trilobites and, plant fossils
- the identification of selected crystal models and twin crystal models, based on the study of their characteristics

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
IV	U19GY6	CRYSTALLOGRAPHY AND GEMOLOGY	4	25	75	100

Course Objectives

To impart knowledge on

- Morphological characters of crystals, laws of crystallography, crystallographic system and classes
- Symmetry elements and forms of different classes of crystallographic systems
- Twinning in crystals and laws of twinning
- Gemstones – their origin, occurrence, types, evaluation, weighing, cutting techniques, their global and Indian distribution
- Gemstone identification properties, identification instruments, properties of important gemstones

Unit 1: Definition of crystal – Morphological characters of crystals: faces, forms, edges, solid angles, interfacial angle – Contact Goniometer and its use – Symmetry elements, crystallographic axes, axial ratio – Crystal notation: parameter system of Weiss and Miller indices – Laws of Crystallography: law of constancy of symmetry, law of constancy of interfacial angles and the law of rational indices – Classification of crystals into systems and classes – holohedral, hemihedral, hemimorphic and enantiomorphic forms in crystals – Elementary knowledge of spherical and stereographic projections – Study of the symmetry elements, and forms of the normal, pyritohedral, tetrahedral and plagiohedral classes of cubic system with special reference to well-developed crystals of Galena, Spinel, Garnet, Fluorite, Diamond, Pyrite, Tetrahedrite, Boracite and cuprite.

Unit 2: Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Pyramidal Hemimorphic, Sphenoidal and Trapezohedral classes of Tetragonal system with special reference to well-developed crystals of zircon, Rutile, Cassiterite, Vesuvianite, Apophyllite, Scheelite, Meionite, Wulfenite and Chalcopyrite – Study of the symmetry elements and forms of Normal, Hemimorphic Tripyramidal, pyramidal Hemimorphic, Trapezohedral, Rhombohedral, Rhombohedral Hemimorphic, Trirhomboidal and Trapezohedral classes of Hexagonal system with special reference to well-developed crystals of Beryl, Zincite, Apatite, Calcite, Corundum, Tourmaline, Phenacite and Quartz – Study of the symmetry elements and forms of the Normal, Hemimorphic and Sphenoidal classes of Orthorhombic system with special reference to well-developed crystals of Barite, Olivine Topaz, Staurolite, Sulphur, Calamine, Struvite and Epsomite.

Unit 3: Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems with special reference to well-developed crystals of Gypsum, Orthoclase, Albite, Augite, Axinite and Kyanite – Twin crystals: Effects of twinning – laws of twinning – composition plane, twinning plane and twinning axis, indices of twins – Simple and repeated (polysynthetic twins), contact and penetration twins, secondary twins – Study of twin laws pertaining to the following crystals – Fluorite (spinel law), Pyrite (iron-cross twin), Rutile (geniculate), Calcite, Quartz (Brazil laws), Aragonite (mimetic twin), Staurolite (cruciform), Gypsum, Augite and Feldspars (Carlsbad, Baveno, Manebach, Albite and Pericline).

Unit 4: Introduction to Mineralogy – Gemstones: minerals used as gemstones, their chemical composition, origin and occurrence – Types of gemstones: Inorganic, organic and synthetic gemstones

– Quality, grading, and evaluation of gemstones – Weighing of gemstones – Gemstone cutting techniques – Enhancement and fashioning of gemstones – Mining of gemstones – Global and Indian occurrences of gemstones – Gemstone belts of Tamil Nadu.

Unit 5: Gemstone identification properties: crystallography, cleavage, parting, fracture, hardness, specific gravity, density, colour, lustre, sheen, reflection, refraction, dispersion, pleochroism, spectroscopy, luminescence, electrical and thermal properties – Gemstone identification instruments – Gemstone identification flow chart – Properties of the following gemstones: Alexandrite, aquamarine, diamond, emerald, ruby, sapphire, pearl and coral.

Text Books

1. Berry, L.G and B. Mason (2019). *Elements of Mineralogy (2nd eBook Edition)*, CBS Publishers and Distributors, New Delhi.
2. Dana, F.S (1955). *A Text Book of Mineralogy*, Asia publishing House, Wiley.
3. Read, H.H (1974). *Rutley's Elements of Mineralogy*, Thomas Murby & Co.
4. Phillips, P.C (1956). *An Introduction to Crystallography*, Longmans Green & Co.
5. Read, P.G (1988). *Beginner's Guide to Gemology*, Newnes Publishers, 234p.

Reference Books:

1. Karnath K.V (1989). *Gem and Gem Industry in India*, Geo. Soc. India Pub., Bengaluru,
2. Read, P.G (2005). *Gemmology (III Edition)*, Elsevier Butterworth-Heinemann, London, 341p.
3. Schumann, W (2013). *Gemstones of the World (V Edition)*, Sterling Publishers, 320p
4. Wade, F.A and R.B. Mattox (1960). *Elements of Crystallography and Mineralogy*, Harper & Bros.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- Morphological characters of crystals, laws of crystallography, crystallographic system and classes
- Symmetry elements and forms of different classes of crystallographic systems
- Twinning in crystals and laws of twinning
- Gemstones – their origin, occurrence, types, evaluation, weighing, cutting techniques, their global and Indian distribution
- Gemstone identification properties, identification instruments, properties of important gemstones

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY7	INDIAN STRATIGRAPHY	5	25	75	100

Course Objectives:

To impart knowledge on

- Principles of Stratigraphy, correlation methods, classification of stratigraphic units, physiographic divisions and tectonic framework of India and, Indian Geologic Time Scale.
- Distribution, classification, economic importance and life forms of Precambrian in India
- Distribution, classification, economic importance and life forms of Paleozoic in India
- Distribution, classification, economic importance and life forms of Mesozoic of India, including Deccan traps
- Geological events of Cenozoic Era in India, important Tertiary formations in South India

Unit 1: Stratigraphy – Introduction: Principles of Stratigraphy – Correlation: modern methods of stratigraphic correlation – Physical and biological criteria of correlation – Fossiliferous and Unfossiliferous rocks – Classification of stratigraphic sequences/units: lithostratigraphic, biostratigraphic, chronostratigraphic, sequence stratigraphic and magneto-stratigraphic sequences/units, and their interrelationships – Physiographic divisions and tectonic framework of India: Peninsular India, Indo-gangetic alluvial plains, Extra-peninsular India – Indian Geologic Time Scale

Unit 2: Precambrian Stratigraphy: Distribution and classification of Precambrian rocks of India – Dharwar Province – Eastern Ghat belt – Sausar and Sakoli Series – Archaeans of Singhbhum – Iron Ore Series and Gangpur Series – Descriptive Stratigraphy and economic importance of the Archaean and Dharwar rocks of the Peninsular India – Descriptive Stratigraphy of Cuddapah and Vindhyan Super Groups – Economic importance of Precambrians – Precambrian of Tamil Nadu – Life during Precambrian – Eparchaean Unconformity – An outline on cratons, shield areas, mobile belts and platforms

Unit 3: Phanerozoic Stratigraphy (Palaeozoic, Mesozoic and Cenozoic): Study of stratigraphic distribution and lithology of Phanerozoic rocks of India with reference to fauna, flora and economic importance – **Palaeozoic Stratigraphy:** Distribution of Palaeozoic rocks in India – Cambrian of Salt Range – Age of Saline Series – Upper Carboniferous and Permian rocks of Salt Range – Haimantha system of Spiti and Kashmir – Permocarbiniferous of Kashmir Valley and its equivalents from Spiti Valley and Zaskar – Umaria marine beds.

Unit 4: Mesozoic Stratigraphy: Distribution, structure, climate, the depositional environment (conditions of sedimentation), life and economic importance of Gondwana formations of India – Gondwana formations of Tamil Nadu – Triassic of Spiti, Lilang System – Jurassic of Kutch – Cretaceous of Tiruchirappalli-Pondicherry – Bagh beds and Lameta beds – Deccan traps: distribution and structure, infratrappean and intertrappean beds and age.

Unit 5: Cenozoic Stratigraphy: Geological events of Cenozoic Era in India: Rise of Himalayas and Pleistocene glaciation – Stratigraphy, conditions of deposition, fauna and flora of Siwalik System – Tertiary formations of Assam– Karewa Series – Important Tertiary formations of South India: Cuddalore sandstone, Rajahmundry sandstone, Warkala beds and Quilon beds – Mineral wealth of Tertiary formations of Tamil Nadu.

Text Books

1. Krishnan, M. S (2003). *Geology of India and Burma (VI Edition)*, CBS Publishers and Distributors, Delhi.
2. Lemon, R. Y (1990). *Principles of Stratigraphy*, Merrill Publishing Co.
3. Ravindrakumar, K. R (2018). *Fundamentals of Historical Geology and Stratigraphy of India*, New Age Publishers, New Delhi.
4. Wadia, D. N (1953). *Geology of India*, Tata McGraw Hill Publishing Co., New Delhi.
5. Selvam, T. A and K.S. Subramanian (2002). *Geology of Tamil Nadu and Pondicherry*, Geological Society of India Publications, Bangalore.

Reference Books

1. Doyle, P and M.R. Bennett (1996). *Unlocking the Stratigraphic Record*, John Wiley India Publications.
2. Dunbar, C. O and J. Rodgers (1960). *Principles of Stratigraphy*, McGraw Hill.
3. Geological Society of India (1990). *Stratigraphic Boundary Problems in India*, Memoir 16, ISSN No: 0016-7622, Geological Society of India, Bangalore, 116p.
4. Lemon, R. Y (1990). *Principles of Stratigraphy*, Merrill Publishing Co.
5. Naqvi, S. M and J.J.W. Rogers (1987). *Precambrian Geology of India*, Oxford University Press.
6. Ramakrishnan, M and R. Vaidyanadhan (2008). *Geology of India (Vols. 1 & 2)*, Geological Society of India, Bangalore.
7. Valdiya, K. S (2010). *The Making of India*, Macmillan India Publications, New Delhi

Course Outcomes:

On completion of the course the students would have acquired a comprehensive knowledge on

- Principles of Stratigraphy, correlation methods, classification of stratigraphic units, physiographic divisions and tectonic framework of India and, Indian Geologic Time Scale.
- Distribution, classification, economic importance and life forms of Precambrians in India
- Distribution, classification, economic importance and life forms of Paleozoic in India
- Distribution, classification, economic importance and life forms of Mesozoic of India, including Deccan traps
- Geological events of Cenozoic Era in India, important Tertiary formations in South India

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY8	MINERALOGY	5	25	75	100

Course Objectives:

To impart knowledge on

- Atomic bonding in minerals, structure, classification and physical properties of minerals
- Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of quartz, feldspar, feldspathoids, mica, zeolites group and alumino silicates
- Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of pyroxene, amphibole, olivine and garnet group minerals
- Principles of Optical Mineralogy, parts and functioning of petrological microscope and optical accessories
- Optical properties of minerals, determination of optic axial angle and optic sign

Unit 1: Definition of mineral and mineraloid – Scope and aim of Mineralogy – Atomic bonding in minerals – Structure and classification of silicates – Isomorphism, polymorphism and pseudomorphism in minerals – Physical properties of minerals depending upon cohesion and elasticity, specific gravity, light, heat, electricity, magnetism and the senses – Determination of specific gravity of minerals: Joly balance method – Percussion figures in mica.

Unit 2: Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of the following groups of minerals: Quartz group, Feldspar group, Feldspathoids, Mica, Zeolites and alumino silicates.

Unit 3: Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of the following groups of minerals: Pyroxenes, Amphiboles, Olivine and Garnet – Physical and optical properties, chemical composition, uses and modes of occurrence of the following minerals: Epidote, Chlorite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Topaz, Staurolite, Beryl, Tourmaline, Fluorite, Apatite, Zircon, Rutile and Corundum.

Unit 4: Nature of light, wave nomenclature, phase, Perception of colour – Reflection, critical angle and total internal reflection – Isotropic and anisotropic media – Dispersion – Ordinary and polarized light – Methods of polarization: by selective absorption, by double refraction, Brewster's angle and Snell's law, polarisation by reflection – Petrological microscope and its parts – Optical accessories, their construction and uses: quartz wedge, gypsum plate, mica plate, and Berek's Compensator.

Unit 5: Optical properties of isotropic and anisotropic minerals – Definition of optic axis, optically uniaxial and biaxial minerals, fast ray and slow ray, birefringence, uniaxial and biaxial indicatrix, retardation – Interference phenomena, orders of interference colours – Extinction: types of extinction, extinction angle and procedure for its determination – Sign of elongation and its determination – Pleochroism and dichroism – Characters of Uniaxial and biaxial minerals – Optic axial angle – Acute and obtuse bisectrix – Optic sign of uniaxial and biaxial minerals – Optical anomalies.

Text Books

1. Dana, F.S (1955). *A Text Book of Mineralogy*, Asia Publishing House, Wiley.
2. Read, H.H (1974). *Rutley's Elements of Mineralogy*, Thomas Murby & Co.
3. Mason, Band L.G. Berry (2004). *Elements of Mineralogy (II Edition)*, CBS Publishers, 561p.
4. Winchell, A.N (1968). *Elements of Optical Mineralogy*, Wiley Eastern Pvt. Ltd.

Reference Books:

1. Deer, W.A., Howoe, R.A and J. Zuessman (1966). *An Introduction of the Rock Forming Minerals*, Longmans.
2. Cornelis Klen and Cornelius S. Hurlbut (1985). *Manual of Minerology*, John Wiley & Sons
3. Dyar, M and M.E. Gunter (2007). *Mineralogy and Optical Mineralogy*, Mineralogical Society of America, 705p.
4. Gribble, C.D and A.J. Hall (1985). *A Practical Introduction to Optical Mineralogy*, Springer, 252p.
5. Kerr, P.F (1959). *Optical Mineralogy*, McGraw Hill, New York, 442p.
6. Nesse, W.D (1991). *Introduction to Optical Mineralogy*, Oxford University Press, Oxford, 335p.

Course Outcomes:

On completion of the course the students would have acquired a comprehensive knowledge on

- Atomic bonding, structure, classification and physical properties of minerals
- Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of quartz, feldspar, feldspathoids, mica, zeolites group and alumino silicates
- Mineralogy, structure, chemistry, optical and physical properties, mode of occurrences and industrial uses of pyroxene, amphibole, olivine and garnet group minerals
- Principles of Optical Mineralogy, parts and functioning of petrological microscope and optical accessories
- Optical properties of minerals, determination of optic axial angle and optic sign

Sem	Course Code	Course Title	Credit	Marks			
				I	E	O	T
V	U19GY9P	PRACTICAL III – MINERALOGY, HYDROGEOLOGY AND MINING GEOLOGY	5	25	70	5	100

Course Objectives:

To impart knowledge on

- The physical properties and identification of important minerals
- The optical properties and identification of important minerals using petrological microscope
- Solving problems relating to the estimation of ore reserves
- Solving problems relating to hydrogeology

Megascopic Description and Identification of the Following Minerals:

- Quartz, Amethyst, Chalcedony, Agate, Jasper, Chert, Opal. Orthoclase, Microcline, Albite, Anorthite, Oligoclase, Labradorite, Nepheline, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wolastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Glaucofane, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Chlorite, Epidote, Garnet, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Tourmaline, Fluorite.

Microscopic Description and Identification of the Following Minerals:

- Quartz, Orthoclase, Microcline, Perthite, Albite, Labradorite, Nepheline, Enstatite, Hypersthene, Diopside, Augite, Aegirine, Anthophyllite, Hornblende, Glaucofane, Tremolite, Biotite, Muscovite, Olivine, Epidote, Garnet, Apatite, Zircon, Sphene, Tourmaline, Calcite, Andalusite, Kyanite, Sillimanite, Staurolite, and Cordierite

Mining Geology:

- Calculation of ore reserves – Included area method.

Hydrogeology

- Simple problems relating to interpretation of rainfall data, hydrogeological data, inverse slope method, hydrochemistry, recharge and discharge problems.

Course Outcomes:

On completion of the course the students would have acquired a comprehensive knowledge on

- The physical properties and identification of important minerals
- The optical properties and identification of important minerals using petrological microscope
- Solving problems relating to the estimation of ore reserves
- Solving problems relating to hydrogeology

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY10E1	MINERAL PROSPECTING AND MINING GEOLOGY	4	25	75	100

Course Objectives:

To impart knowledge on

- The essentials of geological exploration including geological guides for mineral prospecting, sampling and drilling methods and ore reserve estimation
- Principles, applications and limitations and applications of various geophysical exploration methods
- The essentials of geochemical exploration
- Nomenclature in mining, surface and alluvial mining methods and equipments used
- Underground mining, coal mining methods and equipments used

Unit 1: Geological Exploration: Criteria controlling the choice of sites for geological prospecting – Geological Guides – physiographic, lithologic, structural and stratigraphic guides – Sampling methods: channel sampling, bulk sampling, pitting, trenching and core sampling – Coning and Quartering – Drilling: types of drilling methods, their applications and limitations – Ore reserve estimation.

Unit 2: Geophysical Exploration: Basic concepts of Geophysics – Principles, outline on instruments and field procedure, applications and limitations of various geophysical exploration methods: electrical (Resistivity and self-potential method) – magnetic – seismic – gravity and electromagnetic methods

Unit 3: Geochemical Exploration: Basic concepts of geochemistry – Geochemical cycle – General principles of geochemical prospecting – Geochemical dispersion – Background and threshold values – Geochemical anomalies – Path finder elements – Application of geochemistry in mineral exploration – Brief introduction to pedo-geochemical, hydro-geochemical, litho-geochemical and bio-geochemical methods – Outline on geobotanical indicators.

Unit 4: Mining Geology: Role of geology in mining – Definition of mining terms: shaft, adit, roof, drive, crosscut, tunnel, raise, winze and stope – Mining methods: surface methods, alluvial mining – pan & betea, sluicing, hydraulicking and dredging – Opencast mining – benches, explosives, and working slope – Mining equipments: Dragline, power showels, bucket wheel excavators, conveyor and overburden.

Unit 5: Underground mining: advantages and limitations – Stopping (open stoping, supported stoping (pillar-supported stoping, square-supported stoping and timber-supported stoping), filled stopes, shrinkage stopes), shaft sinking, caving, top slicing, sublevel caving and block caving – Coal mining (Surface mining): strip mining and augering, Coal mining (Underground mining): room and pillar method, longwall method.

Text Books

1. Arogyaswamy, R.N.P (1986). *Courses in Mining Geology*, Oxford & IBH Publishing Co., New Delhi.
2. Hawkes, H.E and J.S. Webb (1980). *Geochemistry in Mineral Exploration*, Harper & Row.
3. Mason, B (1966). *Principles of Geochemistry*, Willey Toppan.
4. McKinstry, H. E (2000). *Mining Geology*, Asia Publishing House.
5. Ramachandra Rao, M. B (1975). *Outlines of Geophysical Prospecting - A manual for Geologist*, English Book Depot, Dehradun.
6. Lowrie, W (1997). *Fundamentals of Geophysics*, Cambridge.

References Books

1. Dobrin, M.B (1981). *Introduction to Geophysical Prospecting*, McGraw Hill International Book Company.
2. Kearey, P and M. Brooks (1984). *An Introduction to Geophysical Exploration*, ELBS.
3. Mathur, S.M (2001). *Guide to Field Geology*, Prentice Hall of India.
4. Robinson, E. Sand C. Coruh (2002). *Basic Exploration Geophysics*, John Wiley.
5. Sinha, R.K (2000). *Mineral Economics*, Oxford & IBH Publishing Co.
6. Thamus, P.J (1979). *An Introduction to Mining*, Methun.

Course Outcomes:

On completion of the course the students would have acquired a comprehensive knowledge on

- The essentials of geological exploration including geological guides for mineral prospecting, sampling and drilling methods and ore reserve estimation
- Principles, applications and limitations and applications of various geophysical exploration methods
- The essentials of geochemical exploration
- Nomenclature in mining, surface and alluvial mining methods and equipments used
- Underground mining, coal mining methods and equipments used

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY10E2	GEOEXPLORATION AND FIELD GEOLOGY	5	25	75	100

Course Objectives:

To impart knowledge on

- Principles of geological exploration, guides to ore search, sampling and its types, types of drilling
- Principles, equipments, data interpretation, and applications of geophysical methods for ore search
- Principles and procedures of geochemical and biogeochemical methods of exploration.
- Essentials of field geological investigations
- Topographic features in topographic sheets, types of field mapping techniques, preparation of geological map and geological field report

Unit 1: Geological Exploration: Criteria controlling the choice of sites for geological prospecting – Guides to ore search – Sampling: definition of a sample – sample requirement as to the size, purity, contamination, packing – Types of samples: chip samples, muck samples, car samples, channel samples, grid samples – Sampling methods: channel sampling, bulk sampling, pitting and trenching the ore bodies, drill-hole or core sampling – Coning and quartering – Drilling: Various types of drilling methods, their applications and limitations – Applications of sampling.

Unit 2: Geophysical Exploration: Basic philosophy of the methods of geophysical prospecting – Natural and artificial fields – Physical, Electrical, Magnetic and Radioactive properties of rocks and minerals related to geophysics – Geophysical anomalies: regional and local anomalies – Principles, instruments, field procedures, applications and limitations of electrical, magnetic, seismic, gravity and radioactive methods of geophysical exploration.

Unit 3: Geochemical Exploration: Principles of geochemical prospecting – Origin and abundance of elements in the earth's crust – Geochemical cycle – Geochemical dispersion: Primary dispersion and secondary dispersion – Background values, threshold values and geochemical anomalies – Interpretation of geochemical anomalies – Key and path finder elements – Geothermometry and geothermobarometry – Introduction to pedogeochemical, hydrogeochemical, lithogeochemical and biogeochemical methods – Geobotanical indicators.

Unit 4: Field Geology: Importance of field geology – Tasks of field geologist – Preparation for and planning of field trip – Field equipments: clinometer compass and brunton compass, their uses – Elements of geological field diary – Places of importance for the field geologist – where to look for outcrops, fossils and other geological features – Detailed study of contouring, dip, true dip and apparent dip, their relationship with strike – Influence of dip and ground slope on outcrops – True thickness and vertical thickness of beds: their measurement in the field, their relationships, their calculation from field data – Conditions that bring about repetition of outcrops.

Unit 5: Topographic features, methods of representing topography on maps – Topographic map – Marginal information of toposheets: details printed on the map, cardinal points (directions) conventional signs, scale of map, map references (indexing), orienting the map – Locating the position of outcrops on a map, plotting attitude of beds, symbols used for rock types and various structural features – Different types of field mapping techniques: quarry mapping, structural mapping and lithologic mapping – Geological maps: symbols used for various geological features – Outline on the preparation of geological map and geological field report.

Text Books

1. Arogyaswamy, R. N. P (1986). *Courses in Mining Geology*, Oxford & IBH Publishing Co., New Delhi.
2. Compton, R. R (1962). *Field Geology*, Wiley Publishers.
3. Dhanaraju, R (2009). *Handbook of Mineral Exploration and Ore Petrology: Techniques and Applications*, Geological Society of India, 494p.
4. Gokhale, N. W (1987). *Manual of Geological Maps*, CBS Publishers and Distributors, New Delhi
5. Lahee, F. H (2002). *Field Geology (VI Edition)*, McGraw Hill Publishers.
6. Mason, B and C.B. Moore (1991). *Introduction to Geochemistry*, Wiley Eastern.
7. Misra, K. C (2012). *Introduction to Geochemistry: Principles and Applications*, Wiley-Blackwell.
8. Ramachandra Rao, M. B (1975). *Outlines of Geophysical Prospecting - A Manual for Geologist*, English Book Depot, Dehradun.
9. Solovov, A. P (1987). *Geochemical Prospecting*, Mir Publishers, Moscow.
10. Thomas, J. A. G (1980). *Interpretation to Geological Maps*, Murby Publishers.

References Books

1. Chiplonker, G.W (1960). *Geological Maps*, Dastane Bros., Pune.
2. Dobrin, M. B (2001). *Introduction to Geophysical Prospecting*, McGraw Hill Inc.
3. Faure, G (1998). *Principles and Applications of Geochemistry*, Prentice Hall.
4. Kovalevskill, A. L (1987). *Biogeochemical Exploration for Mineral Deposits*, VSP Publishers, 227p.
5. Krauskauf, B. K (1988). *Introduction to Geochemistry (II Edition)*, McGraw-Hill Book Company, 601p.
6. Kreiter, V. M (2004). *Geological Prospecting and Exploration*, Univeristy Press of the Pacific.
7. Lowrie, W (1997). *Fundamentals of Geophysics*, Cambridge.
8. Marjoribanks, R (2010). *Geological Methods in Mineral Exploration and Mining (II Edition)*, Springer, 253p.
9. Mathur, S. M (2001). *Guide to Field Geology*, Prentice Hall of India.
10. Moon, C. J., Whateley, M. K. G. and A. M. Evans (2006). *Introduction to Mineral Exploration (Ed.2)*, 481p.

Course Outcomes:

On completion of the course the students would have acquired a comprehensive knowledge on

- Principles of geological exploration, guides to ore search, sampling and its types, types of drilling
- Principles, equipments, data interpretation, and applications of geophysical methods for ore search
- Principles and procedures of geochemical and biogeochemical methods of exploration.
- Essentials of field geological investigations
- Topographic features in topographic sheets, types of field mapping techniques, preparation of geological map and geological field report

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY11E1	HYDROGEOLOGY AND ENVIRONMENTAL GEOLOGY	5	25	75	100

Course Objectives:

To impart knowledge on

- Hydrological properties of geological formations and groundwater movement
- Vertical distribution of groundwater, types of aquifers, groundwater quality parameters, drinking water standards of WHO and BIS, and groundwater exploration methods
- Natural and artificial discharge of groundwater, groundwater recharge, rainwater harvesting, groundwater fluctuations and salt water intrusion
- The concepts of Environmental Geology, river flooding, mass movement and, coastal erosion, their hazards, and the role of Geology in their mitigation
- Earthquakes, volcanic activity, mining activities, with special reference to their hazards, mitigation measures and, the role of geology in it, and about water and marine pollution and, environmental laws in India

Unit 1: Hydrologic cycle – Origin of groundwater: meteoric water; connate water and juvenile water – Hydrological properties of geological formations: porosity, permeability, hydraulic conductivity, transmissivity, specific retention, specific yield, specific capacity – Porosity: primary and secondary porosities, void ratio, effective porosity – Water flow: laminar flow and turbulent flow – Forces causing groundwater movement: Potential energy and hydraulic head, direction of ground water flow – Darcy’s law – Measurement of permeability: laboratory methods and field methods.

Unit 2: Definition of aquifers, aquitards, aquifuges and aquicludes – Vertical distribution of groundwater: zone of aeration, zone of saturation, water table and piezometric surface – Types of aquifers: unconfined, confined, and perched aquifers – Geologic formations as aquifers – Groundwater quality: physical, chemical and biological qualities – Latest WHO & BIS Drinking water standards – Groundwater exploration: Outline of surface methods and subsurface methods, principles and methods of electrical resistivity for ground water exploration.

Unit 3: Natural discharge of ground water: springs, hot springs, geysers, artesian wells and seepage – Geological conditions favouring development of springs – Artificial discharge of ground water: Water wells and types of water wells – Pumping from wells and cone of depression, Well hydrographs – Groundwater recharge: natural and artificial recharge – Rain water harvesting – Fluctuations in Groundwater levels: causes and effects of fluctuations – Salt water intrusion: causes, effects and control.

Unit 4: Basic concepts of Environmental Geology – River flooding: causes and impacts, mitigation measures and the role of geology in flood mitigation planning – Mass movement: types, causes and impacts, mitigation measures and the role of geology in mass movement mitigation planning – Coastal erosion: causes, impacts, coastal erosion mitigation planning – Global climatic change: outline of influencing factors and impacts.

Unit 5: Earthquakes: Elastic rebound theory, distribution, expression of earthquake strength, hazards, earthquake hazards mitigation planning and the role of Geology – Volcanic activity: types, distribution, hazards, strategies for reducing hazards of volcanic activity and the role of Geology – Environmental impacts of mining activities – Surface water, Groundwater and marine pollution: causes, hazards and strategies for their reduction – Outline of the environmental laws in India.

Text Books

1. David Keith Todd (2005). *Groundwater Hydrology*, Wiley India Pvt. Ltd., New Delhi.
2. Keller, E.A (2012). *Introduction to Environmental Geology (V Edition)*, Pearson Prentice Hall, New York, 705p.
3. Montgomery, C.W (2011). *Environmental Geology (IX Edition)*, McGraw-Hill Pub., New York, 511p.
4. Raghunath, H.M (2007). *Groundwater*, Wiley Eastern Limited, New Delhi.
5. Ramakrishnan S (1998). *Groundwater*, KJ Graphs arts, Chennai.

Reference Books

1. Fetter C.W (2007). *Applied Hydrogeology*, CBS Publishers, New Delhi.
2. Gokhale N.W (2009). *All About Water*, CBS Publishers, New Delhi.
3. McConnell, R.L and D.C. Abel (2015). *Environmental Geology Today*, Jones and Bartlett Learning, Burlington, 844p.
4. Reichard, J.S (2011). *Environmental Geology*, McGraw Hill, New York, 545p.
5. Valdiya, K.S (1987). *Environmental Geology – Indian Context*, Tata McGraw Hill Publications, New Delhi, 583p.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- Hydrological properties of geological formations and groundwater movement
- Vertical distribution of groundwater, types of aquifers, groundwater quality parameters, drinking water standards of WHO and BIS, and groundwater exploration methods
- Natural and artificial discharge of groundwater, groundwater recharge, rainwater harvesting, groundwater fluctuations and salt water intrusion
- The concepts of Environmental Geology, about river flooding, mass movement and, coastal erosion, their hazards, and the role of Geology in their mitigation
- Earthquakes, volcanic activity, mining activities, with special reference to their hazards, mitigation measures and, the role of geology in it, and about water and marine pollution and, environmental laws in India

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19GY11E2	NATURAL DISASTERS	4	25	75	100

Course Objectives

To impart knowledge on the

- Natural disasters, their classes, major natural disasters since 1900, and their trends, energy sources of disasters and, an account of UNDRR, NDMA
- Earthquake, volcanic eruption, mass movements and their hazards and, strategies for their mitigation
- Floods, cyclones, global climatic change: factors governing their severity, hazards and their mitigation
- Droughts, heat waves, forest fires: factors governing their severity, their hazards and strategies for their mitigation.
- Desertification, dust and sand storms, pandemics and epidemics, lightning strikes and meteoritic impacts

Unit 1: Natural disasters: Natural disasters and their classification – Internal and external energy sources of disasters – Major natural disasters since 1900 – Natural disasters and their trends – Outline on natural disaster hazard, vulnerability and, risk assessment, integrated management, community awareness and participation – UNDRR, India's NDMA and Government of Tamil Nadu's SDMA and their role in disaster management.

Unit 2: Earthquakes: distribution and its relation to plate tectonics, major earthquakes of the world and the Indian subcontinent, earthquake related hazards and their mitigation – Volcanic eruption: distribution of active volcanoes and their relation to plate tectonics, major volcanic eruptions of the world, hazards relating to volcanic eruption and their mitigation – Mass movements: factors influencing mass movements, hazards relating to mass movements and their mitigation.

Unit 3: Floods: types of floods, factors governing flood severity, characteristics of floods, hazards relating to floods and strategies for their reduction – Cyclones: types, factors governing severity of cyclones, hazards relating to cyclones and strategies for their reduction – Global climatic change: factors governing its severity, related hazards and strategies for their reduction.

Unit 4: Droughts: types of droughts, factors governing severity of droughts, hazards relating to droughts and strategies for their reduction – Heat waves: factors governing its severity, characteristics of heat waves, hazards relating to heat waves and strategies for their reduction – Forest fires: factors governing its severity, characteristics of forest fires, hazards relating to forest fires and strategies for their reduction.

Unit 5: Desertification: factors governing its severity, related hazards and strategies for their reduction – Dust storms and sand storms: factors governing their severity, their characteristics, hazards relating to them and strategies for their reduction – Pandemics and epidemics: Important events and their impacts – Lightning strikes and meteoritic impacts: their hazards.

Text Books

1. Abbott, P.L (2020). *Natural Disasters (XI Edition)*, McGraw Hill Publishers, 546p.
2. Ebert, C.H.V (2000). *Disasters: An Analysis of Natural and Human Induced Hazards (IV Edition)*, Kendall/Hunt Pub., 240p.
3. Cheval, S (2012). *Natural Disasters*, InTech free online edition, Croatia, 166p.

Reference Books:

1. Claire Watts (2006). *Natural Disasters*, DK Publishing Inc., London, 76p.
2. Lee Davis (2008). *Natural Disasters*, Facts on File, Inc., New York, 464p.
3. Marlene Bradford (2007). *Notable Natural Disasters*, Salem Press Inc., 1050p.
4. The World Bank and the United Nations (2010). *Natural Hazards, Unnatural Disasters: The Economics of Effective Prevention*, 279p.

Course Outcomes

On completion of the course, the student would have gained a comprehensive gained knowledge on

- Natural disasters, their classes, major natural disasters since 1900, and their trends, energy sources of disasters and, an account of UNDRR, NDMA
- Earthquake, volcanic eruption, mass movements and their hazards and, strategies for their mitigation
- Floods, cyclones, global climatic change: factors governing their severity, hazards and their mitigation
- Droughts, heat waves, forest fires: factors governing their severity, their hazards and strategies for their mitigation.
- Desertification, dust and sand storms, pandemics and epidemics, lightning strikes and meteoritic impacts

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
VI	U19GY12	IGNEOUS & METAMORPHIC PETROLOGY	6	25	75	100

Course Objectives:

To impart knowledge on

- The forms, structures, textures and classification of igneous rocks
- Types of magma and their properties, crystallisation of unitary and binary systems
- Petrographic characters of Granite, Syenite, Diorite, Gabbro and their volcanic equivalents, petrography and origin of Anorthosites of Sittampundi and Ottanchatram, Syenites of Sivanmalai and Dunites of Salem.
- Metamorphic zones, grades and facies, and types of metamorphism
- Metamorphic structures and textures, petrography and origin of important metamorphic rocks

Unit I: Forms of igneous rocks: extrusive and intrusive – Structures of igneous rocks – Textures of igneous rocks – Classification of igneous rocks: classification based on colour index, silica saturation, silica contents, alumina saturation – CIPW Normative classification – Tyrrell’s tabular classification – IUGS Modal classification for plutonic and volcanic rocks.

Unit 2: Magma: outline on types, chemical composition and physical properties – Bowen’s reaction principle – Crystallization of unitary magma: SiO₂ System – Crystallization of binary magma: Diopside–Anorthite eutectic system, Albite–Anorthite solid-solution system, Forsterite–Silica incongruent melting system – Short notes on magmatic differentiation, fractional crystallization, liquid immiscibility and assimilation – Short notes on variation diagrams and petrographic provinces.

Unit 3: Texture, mineralogy, classification, modes of occurrence of plutonic rocks and their hypabyssal and volcanic equivalents of Granite, Syenite, Diorite, Gabbro – Petrographic characters and origin of the following rocks: Anorthosites of Sittampundi and Ottanchatram, Syenites of Sivanmalai and Dunites of Salem.

Unit 4: Metamorphism: definition and agents – Metamorphic zones – Metamorphic grades – Metamorphic facies – Types of metamorphism: Thermal metamorphism, dynamothermal metamorphism, plutonic metamorphism, regional metamorphism, contact metasomatism, metamorphism of partial melting, Anataxis and palingensis.

Unit 5: Metamorphic structures – Metamorphic textures – Petrography and origin of the following metamorphic rocks: Phyllite, Slate, Schist, Gneiss, Granulite, Khondalite, Marble, Quartzite and Charnockite.

Text Books

1. Best, M.G (1993). *Igneous and Sedimentary Petrology*, CBS Publishers and Distributors.
2. Hatch, R.H and A.K. Wells (2003). *Petrology of the Igneous Rocks*, CBS Publishers and Distributors.
3. Turner, F.J and J. Verhoogen (1960). *Igneous and Metamorphic Petrology*, McGraw Hill.
4. Tyrrell, G.W (1963). *Principles of Petrology*, Asia Publishing House
5. Winter J.D (2014). *Igneous and Metamorphic Petrology*, Prentice Hall.

Reference Books

1. Frost, B.R and D.C. Frost (2014). *Essentials of Igneous and Metamorphic Petrology*, Cambridge University Press, New York.
2. Gautham Sen (2014). *Petrology*, Springer Publications.
3. McBirney A.R (1994). *Igneous Petrology*, CBS Publishers and Distributors.
4. Phillipots R. Anthony and Cornelis Klein (2017). *Earth Materials: Introduction to Mineralogy and Petrology*, Cambridge University Press.
5. Raymond L. A (2001). *Petrology: The Study of Igneous, Sedimentary and Metamorphic Rocks*, McGraw Hill.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- The forms, structures, textures and classification of igneous rocks
- Types of magma and their properties, crystallisation of unitary and binary systems
- Petrographic characters of Granite, Syenite, Diorite, Gabbro and their volcanic equivalents, petrography and origin of Anorthosites of Sittampundi and Ottanchatram, Syenites of Sivanmalai and Dunites of Salem.
- Metamorphic zones, grades and facies, and types of metamorphism
- Metamorphic structures and textures, petrography and origin of important metamorphic rocks

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
VI	U19GY13	SEDIMENTARY PETROLOGY AND MARINE GEOLOGY	6	25	75	100

Course Objectives:

To impart knowledge on

- The process of sedimentation, classification, structure and texture of sedimentary rocks
- Residual and mechanical deposits, heavy minerals and provenance studies, petrography and origin of conglomerate, breccia, sandstone and shale.
- Chemical deposits and organic deposits
- Oceans and seas, their dimension and origin, oceanographic explorations, features of ocean floor, shorelines and their types, and their characteristics
- General water circulation in oceans, physical and chemical properties of water, ocean deposits and their types, degradation of coastal environment and their mitigation

Unit 1: Sedimentary process: disintegration and decomposition of rocks, transportation, deposition, lithification and diagenesis – Classification of sedimentary rocks: residual, mechanical, chemical and organic – Structures of sedimentary rocks: mechanical, chemical and organic – Textures of sedimentary rocks: clastic and non-clastic.

Unit 2: Residual deposits: terra rossa, clay, laterite, bauxite and soils – Mechanical deposits: rudaceous, arenaceous and argillaceous – Heavy minerals in sand and sandstones and their use in provenance studies – A descriptive study of conglomerate, breccia, sandstone and shale.

Unit 3: Chemical deposits: siliceous, calcareous and ferruginous – Organic deposits – Calcareous, siliceous, phosphatic, ferruginous and carbonaceous deposits – A brief study of flint, chert, siderite, gypsum, rocksalt, caliche, guano and kiesellgher.

Unit 4: Marine Geology: Oceans and their dimensions – Oceanographic exploration and important milestones – Origin and evolution of ocean basins – Mapping of ocean basins: modern techniques (Echo sounder, side scan sonar, multi beam sonar, radar altimeter) and sea floor chart – Provinces of ocean floor: continental margins, ocean basin, oceanic ridges – Features of active and passive continental margins: continental shelf, continental slope, continental rise – Features of ocean basin: deep-ocean trenches, abyssal plains, guyots, oceanic plateaus, seamounts and volcanic Islands – Mid oceanic ridges and sea floor spreading – Subduction zone and demise of ocean basins – Shorelines and their types.

Unit 5: Brief account on waves, tides, oceanic currents, storm surges and tsunami – Factors affecting general oceanic circulation of water – Coriolis effect and Ekman spiral and, their impacts – Physical and chemical properties of ocean water – Ocean sediments and their types – Marine mineral resources – Marine pollution: causes, hazards, their preventive and remedial measures – Laws of Seas and Oceans – Sea level changes: causes and effects – El Nino and La Nina and their effects.

Text Books

1. Kind, A.H (1979). *Introduction to Marine Geology and Geomorphology*, Edward Arnold
2. Petijohn, F.J (2002). *Sedimentary Rocks (III Edition)*, CBS Publishers & Distributors.
3. Prothero, D. R and Schwab, F (2003). *Sedimentary Geology; An Introduction to Sedimentary Rocks and Stratigraphy*, W. H. Freeman.
4. Shepard, F.P (1973). *Submarine Geology*, Harper and Row.

Reference Books

1. Erickson, J., Timothy and Kusky (2002). *Marine Geology: Exploring the New Frontiers of the Ocean*, Facts on file, Inc., New York, 337p.
2. Eugen Seibold and Wolfgang Berger (2017). *Sea Floor: An Introduction to Marine Geology*, Springer, New York, 272p.
3. Michael McLane (1995). *Sedimentology*, Oxford University Press, London
4. Menard, H.W (1977). *Ocean Sciences – Readings from Scientific American*, Freeman.
5. Sam Boggs (2000). *Principles of Sedimentology and Stratigraphy*, Pearson USA
6. Turekian, K.K (1968). *Oceans*, Prentice Hall, 120p.
7. Tucker, M.E (2001). *Sedimentary Petrology*, Blackwell Science.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- The process of sedimentation, classification, structure and texture of sedimentary rocks
- Residual and mechanical deposits, heavy minerals and provenance studies, petrography and origin of conglomerate, breccia, sandstone and shale.
- Chemical deposits and organic deposits
- Oceans and seas, their dimension and origin, oceanographic explorations, features of ocean floor, shorelines and their types, and their characteristics
- General water circulation in oceans, physical and chemical properties of water, ocean deposits and their types, degradation of coastal environment and their mitigation

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
VI	U19GY14	ECONOMIC GEOLOGY	6	25	75	100

Course Objectives:

To impart knowledge on

- The various processes of formation of economic mineral deposits
- Classification of mineral deposits, controls of ore localisation, origin and uses of coal and petroleum deposits, and their distribution in India
- Composition, mode of occurrences and uses of important metalliferous deposits, and their distribution in India
- Composition, mode of occurrences and uses of important industrial minerals, and their distribution in India

Unit 1: Magmatic processes: early magmatic and late magmatic processes and deposits – Sublimation – Contact metasomatic processes: process, effects and resulting mineral deposits – Hydrothermal processes: principles, factors affecting deposition, wall rock alteration, minerals sequence – Cavity filling deposits: fissure veins, shear zone, stock-work, saddle reef, ladder vein, fold cracks, breccia filling, solution cavities, pore space and vesicular filling – replacement deposits, the process and deposits – criteria of replacement.

Unit 2: Sedimentary processes and cycles: principles involved in sedimentation, cycles of iron and manganese – Principles of weathering processes – Residual concentration process and deposits – Mechanical concentration process and deposits: elluvial, alluvial, beach and aeolian placers, paystreak and bonanza – Oxidation and supergene sulphide enrichment: solution and deposition in the zone of oxidation, secondary sulphide enrichments, gossans and capping – Metamorphic processes: formation of graphite, asbestos, talc, soapstone and alumino silicate group of minerals.

Unit 3: Definition of ore minerals, gangue minerals, tenor of ore, grade of ore – Classification of mineral deposits: outline of Lindgren's and Bateman's classification – Controls of ore localization: structural, stratigraphic, physical and chemical controls – Outline of metallogenetic epochs and provinces, geologic thermometers – Coal: classification, origin, uses and distribution of coal in India – Petroleum: composition, theories of origin and uses – Oil traps – Oil fields of Assam, Cambay and Cauvery basins.

Unit 4: Important ores, their composition, mode of occurrences, uses and distribution in India of the following metalliferous deposits: iron, manganese, aluminium, gold, copper, chromium, lead & zinc.

Unit 5: Mineralogy, mode of occurrences, uses and distribution in India of the minerals required for the following industries: abrasives, fertilizer, paint, refractory, glass, ceramic and cement – Mineral wealth of Tamil Nadu.

Text Books

1. Bateman Allan, M (1962). *Economic Mineral Deposits (II Edition)*, Asian Publishing House,
2. Lindgren, W (1933). *Mineral Deposits*, MCGraw Hill
3. Krishnaswamy, S (1979). *India's Mineral Resources*, Oxford and IBH.
4. Deb, S (1980). *Industrial Minerals and Rocks of India*, Allied.
5. Umeshwar Prasad (2019). *Economic Geology (II Edition)*, CBS Publishers

Reference Books

1. Coggin, B and A.K. Dey (1955). *India's Mineral Wealth*, Oxford Publishing House.
2. Gokhale, K.V.G.K. and T.C. Rao (1978). *Ore Deposits of India, their Distribution and Processing*, Thomson Press.
3. Park, C.F and R.A. Macdiarmid (1970). *Ore Deposits*, Freeman.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- The various processes of formation of economic mineral deposits
- Classification of mineral deposits, controls of ore localisation, origin and uses of coal and petroleum deposits, and their distribution in India
- Composition, mode of occurrences and uses of important metalliferous deposits, and their distribution in India
- Composition, mode of occurrences and uses of important industrial minerals, and their distribution in India

Sem	Course Code	Course Title	Credit	Marks			
				I	E	O	T
VI	U19GY15P	PRACTICAL – IV PETROLOGY AND ECONOMIC GEOLOGY	6	25	70	5	100

Course Objectives:

To impart knowledge on

- Megascopic characters of important igneous, sedimentary and metamorphic rocks
- Optical properties of important igneous, sedimentary and metamorphic rocks
- Megascopic characters, Indian occurrences and uses of important economic minerals
- Identification of economic minerals using bow pipe test

A. Petrology:

i) Megascopic identification of the following rocks:

- Igneous rocks: Granite, Graphic granite, Pegmatite, Aplite, Schorl rock, Syenite, Syenite porphyry, Diorite, Gabbro, Anorthosite, Dunite, Pyroxenite, Dolerite, Diabase Porphyry, Basalt, Trachyte, Rhyolite, Pumice, Scoria.
- Sedimentary rocks: Conglomerate, Breccia, Sandstone, Arkose, Shale, Shell limestone, Laterite, Lignite.
- Metamorphic rocks: Slate, Phyllite, Schists, Gneisses, Quartzite, Marble, Amphibolite, Eclogite, Leptynite, Charnockite and Khondalite.

ii) Microscopic identification and description of the following rocks:

- Igneous rocks: Granite, Aplite, Graphic Granite, Syenite, Nepheline syenite, Diorite, Gabbro, Norite, Dunite, Peridotite, Anorthosite, Dolerite, Trachyte, Andesite, Basalt and Obsidian.
- Sedimentary rocks: Sandstone, Conglomerate, Breccia, Arkose, Shale, Shell limestone.
- Metamorphic rocks: Garnet mica schist, Hornblende schist, Hornblends gneiss, Charnockite, Amphibolite, Quartzite and Marble.

B. Economic Geology:

i) Megascopic identification and description, Indian occurrences and uses of the following ore and industrial minerals:

- Realgar, Orphiment, Stibnite, Molybdenite, Galena, Sphalerite, Cinnabar, Covelite, Bornite, Chalcophyrite, Pyrite, Arsenopyrite, Marcasite. Barite, Celestite, Gypsum. Cuprite, Zincite, Corundum, Hematite, Ilmenite, Magnetite, Chromite, Franklinite, Cassiterite, Pyrolusite, Psilomelane, Limonite, Bauxite, Calcite, Magnesite, Siderite, Witherite, Strontionite, Cerussite, Azurite, Malachite, Chrysocolla, Columbite, Fluorite, Phosphatic Nodule, Graphite, Lignite and Bituminous.

ii) Identification of the following mineral powders by simple blow pipe tests:

- Apatite, Barite, Calcite, Celestite, Cerusite, Chalcopyrite, Galena, Gypsum, Haematite, Magnetite, Magnesite, Psilomelane, Pyrolusite, Siderite, Sphalerite, Strontianite and Witherite.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- Megascopic characters of important igneous, sedimentary and metamorphic rocks
- Optical properties of important igneous, sedimentary and metamorphic rocks
- Megascopic characters, Indian occurrences and uses of important economic minerals
- Identification of economic minerals using blow pipe test

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
VI	U19GY16E1	REMOTE SENSING AND ENGINEERING GEOLOGY	4	25	75	100

Course Objectives

To impart knowledge on

- The fundamentals of Remote Sensing along with an outline of the latest developments in the field, various aspects of Aerial Remote Sensing and Satellite Remote Sensing, along with an outline on Digital Image Processing, GIS, GPS techniques
- The principles Engineering Geology, role of Geology in Civil Engineering, engineering properties of rocks and soils, geological investigation pertaining to foundation and development of roads/highways, railways, bridges and buildings
- Geological investigations pertaining to dam sites and reservoirs, tunnels, coastal protection structures and landslides

Unit 1: Introduction to Remote Sensing: Processes and elements involved in electromagnetic remote sensing – Electromagnetic spectrum: basic characteristics and components – Electromagnetic energy interaction with Earth’s atmosphere – Electromagnetic energy interaction with Earth’s surface features – Spectral reflectance curve of vegetation, soil and water – Outline of platforms of Remote Sensing, data recording and interpretation – Outline of thermal, microwave, hyperspectral and lidar sensing – Applications of Remote Sensing with special reference to Geosciences.

Unit 2: Aerial Remote Sensing: Outline of aerial cameras – Types of aerial photographs – Photoscale and causes for its variation – Flight planning procedures – Stereoscopes: pocket and mirror stereoscopes – Marginal information of aerial photographs – Airphoto interpretation: elements, merits and limitations.

Unit 3: Satellite Remote Sensing: Types of satellites – Scanning systems and detectors – Outline of satellite data products – Types of sensor resolution – Sensor characteristics of Landsat, Spot, IRS and INSAT series of satellites – Outline of high resolution satellites – Satellite image interpretation: visual and digital interpretation techniques – Outline of digital image processing techniques –Outline of GIS, GPS and their applications.

Unit 4: Principles of Engineering Geology – Role of Geologists in Civil Engineering – Elementary concepts of Rock Mechanics and Soil Mechanics – Engineering properties of rocks and soils – Strength and elastic properties – Geological reconnaissance, site investigation, characterization and problems related to civil engineering projects – Geotechnical Report – Geologic considerations and physical characteristics of building stones, concrete aggregates and rail road ballasts – Rock as construction material – Geological investigations pertaining to the foundation and development of roads/highways, Railways (rail tracks), bridges and buildings – Outline on the Earthquake-resistant structures.

Unit 5: Types of Dams – Geological investigations for dam sites and reservoirs – Dam foundation, construction, problems and remedial measures – Geological investigations preceding tunneling in hard and soft grounds – Geological investigations pertaining to coastal protection structures for control or preventive measures of coastal erosion – Geological and geotechnical investigations for the mitigation strategies of mass-movements with special emphasis on landslides – Causes of hill-slope instability – Slope stability – Outline on geosynthetics.

Text Books

1. Lillesand, T.M., Keifer, R.W and J.W. Chipman (2015). *Remote Sensing and Image Interpretation (VII Edition)*, John Wiley & Sons, Inc,719p.
2. Gupta, R.P (2008). *Remote Sensing Geology (II Edition)*, Springer Pub., New Delhi
3. Pandey, S.N (1987). *Principles and Applications of Photogeology*. New Age International, 366p.
4. Bell, F. G (1983). *Fundamentals of Engineering Geology*, Butterworths.
5. Blyth, F. G. H and M.H. De Freitas (1984). *Geology for Engineers (VII Edition)*, Butterworth- Heinemann Pub., 336p.
6. Sathyanarayananaswami, B. S (2000). *Engineering Geology*, Dhanpat Rai & Co., Delhi.
7. Parbin Singh (2003). *Engineering Geology and General Geology*, S. K. Kataria & Sons, New Delhi.
8. Venkat Reddy, D (2010). *Engineering Geology*, Vikas Publishing House Pvt. Ltd., New Delhi.

Reference Books

1. Chuvieca, E and Huete, A (2016). *Fundamentals of Satellite Remote Sensing (II Edition)*, Taylor & Francis Inc., 433p.
2. Sabins, F.F (2007). *Remote Sensing Principles and Interpretation (III Edition)*, Waveland Pr Inc., 512p.
3. Gokhale, K.V.G.K and D.M. Rao (1981). *Experiments in Engineering Geology*, McGraw Hill.
4. Krynine, D.P and W.R. Judd (1957). *Principles of Engineering Geology and Geotechniques*, McGraw Hill.
5. Legget, R F (1962). *Geology and Engineering*, McGraw Hill.
6. Maslov, N.N (1987). *Basic Engineering Geology and Soil Mechanics*, Mir Publishers, Moscow.
7. Murthy, V.N.S (2018). *Soil Mechanics and Foundation Engineering*, CBS Publishers and Distributors Ltd., New Delhi.
8. Ries, H and T.L Watson (2016). *Elements of Engineering Geology*. Wentworth Press, 772p.
9. Pandey, V.K and A. Mishra (2017). *Handbook of Engineering Geology*, CBS Publishers & Distributors Pvt. Ltd., New Delhi.

Course Outcomes

On completion of the course the students would have acquired a comprehensive knowledge on

- The fundamentals of Remote Sensing along with an outline of the latest developments in the field, various aspects of Aerial Remote Sensing and Satellite Remote Sensing, along with an outline on Digital Image Processing, GIS, GPS techniques
- The principles Engineering Geology, role of Geology in Civil Engineering, engineering properties of rocks and soils, geological investigation pertaining to foundation and development of roads/highways, railways, bridges and buildings
- Geological investigations pertaining to dam sites and reservoirs, tunnels, coastal protection structures and landslides

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
VI	U19GY16E2	GIS AND GPS	4	25	75	100

Course Objectives

To impart knowledge on

- History and development of GIS, its components, coordinate systems, map projections and, geospatial data input
- Important data models data collection, capture and geoprocessing
- GIS modeling and analysis
- Applications of GIS in fields relating to geosciences
- History, development and applications of GPS, GLONASS, GALILEO, COMPASS, DGPS, GNSS and RNSS

Unit 1: Introduction: History and development of GIS – Components of GIS – Coordinate systems: Geographical coordinate system and Projected coordinate system – Map projections – Geospatial data – Data input: existing GIS data, creating new data – Data query: attribute data query, spatial data query, raster data query.

Unit 2: Data Models and Management: Data format: Raster and vector data formats – Spatial data models: vector and raster data models, non-spatial data Models, spaghetti model and topology models, grid model, TIN model and network model – Data collection, capture and geoprocessing: sources, input methods, editing, re-projection, geometric transformation, map scale, precision and accuracy.

Unit 3: GIS Modelling and Analysis: Basic elements of GIS modelling – Spatial interpolation: global methods, local methods, krigging method – Comparison of spatial interpolation methods – Vector data analysis: buffering and overlay – Raster data analysis: local operations, neighbourhood operations and zonal operations – Terrain mapping and analysis: DEM and TIN, contour, hill shading, slope and aspect.

Unit 4: Application of GIS: GIS for mineral exploration – GIS for hydrocarbon exploration – GIS for groundwater potential mapping – GIS for water quality evaluation – GIS for flood risk analysis – GIS for seismic zonation – GIS applications in urban planning – GIS for environmental impact analysis.

Unit 5: GPS, DGPS and GNSS: History, components, types and applications of GPS, GLONASS, GALILEO, COMPASS – System segmentation: control segment, user segment, space segment, types of receivers – DGPS: differential corrections, accuracy in DGPS – GNSS: different GNSS, GNSS augmentation – RNSS: IRNSS, WAAS, EGNOS, MSAS, QZSS, SNAS, SDCM WAGE and their advantages and disadvantages.

Text Books

1. Burrough, P.A., McDonnell, R.A and C.D Lloyd (2016). *Principles of Geographical Information Systems*, Oxford University Press, 307p.
2. Kang-Tsung Chang (2017). *Introduction to Geographic Information Systems*, McGraw Hill Education, 468p.
3. Heywood (2009). *An Introduction to Geographical Information Systems*, Pearson Education, 464p.

4. Hofmann-Wellenhof, B., Lichtenegger, H and J. Collins (2012). *GPS: Theory and Practice (V Revised Edition)*, Springer Verlag, 382p.

Reference Books

1. Demers, M.N (2012). *Fundamentals of Geographic Information Systems (IV Edition)*, John Wiley, 460p.
2. Kaplan, E and C. Hegarty (2006). *Understanding GPS: Principles and Applications*, Artech House, INC, Norwood, 680p.
3. Lo, C.P and A.K.W. Yeung (2016). *Concepts and Techniques of Geographic Information Systems*, Pearson Education, 544p.
4. Rahman, A and Shahab Fazal (2017). *Global Positioning System*, New Age Publishers, 210p.
5. Tasha Wade and Shelly Sommer (2006). *A to Z GIS: An Illustrated Dictionary of Geographic Information Systems (II Edition)*, ESRI Press, 268p.
6. Tian, B (2017). *GIS Technology Applications in Environmental and Earth Sciences*, Taylor & Francis Group, 278p.

Course Outcomes

On the completion of the course the student would have gained knowledge on the

- History and development of GIS, its components, coordinate systems, map projections and, geospatial data input
- Important data models data collection, capture and geoprocessing
- GIS modeling and analysis
- Applications of GIS in fields relating to geosciences
- History, development and applications of GPS, GLONASS, GALILEO, COMPASS, DGPS, GNSS and RNSS

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
IV	U19NMGY1	ELEMENTS OF GEOLOGY Non-Major Based Elective Course I	2	25	75	100

Course Objectives

To impart knowledge on

- The subject of Geology and its branches, components and origin of Solar System, Earth's interior and, seas and oceans
- Weathering and its types, landforms produced by running water, wind and coastal processes
- The outline of plate tectonics, fault, fold, joints, unconformities, bedding in sedimentary rocks
- Geological Time Scale, Indian Stratigraphic Divisions, fossils – their types, modes of preservation, and applications, outline of important fossils of India and their geological ages
- Minerals and physical properties with special reference to quartz and feldspars, forms of igneous rocks, types of metamorphism, outline on the characteristics of some important rocks

Unit 1: Geology and its Branches, Solar System and Earth: Scope and branches of Geology – Solar System: components and their important features, outline of hypotheses relating to its origin – Interior of the Earth – Seas and oceans

Unit 2: Physical Geology: Weathering: types and products – Processes and landforms produced by running water – Processes and landforms produced by wind – Landforms produced by coastal processes

Unit 3: Structural Geology: Outline of plate tectonics – Outline of faults, folds, joints and unconformities – Bedding in sedimentary rocks, dip and strike of beds

Unit 4: Stratigraphy and Paleontology: Geologic Time Scale – Indian Stratigraphic Divisions – Fossils: types, their modes of preservation and applications – Outline of important fossils of India and their geological ages

Unit 5: Mineralogy and Petrology: Minerals: definition, classification, physical properties – Brief account of quartz and feldspars – Rocks: definition and types – Igneous rocks: outline of the forms, description of granite, pegmatite and basalt – Sedimentary rocks: description of sandstone, shale and limestone – Metamorphic rocks: Schist, gneiss, charnockite and, types of metamorphism

Text Books

1. Radhakrishnan, V (1987). *General Geology*, VVP Press.
2. Mahapatra, G.B (2016). *Text Book of Physical Geology*, CBS Publishers and Distributors Pvt. Ltd., New Delhi
3. Mukherjee, P.K (1981). *A Text Book of Geology*. World Press
4. Tyrrell, G.W (2019). *Principles of Petrology*, Surjit Publications
5. Roy, A.B (2010). *Fundamentals of Geology*, Narosa Publishing House Pvt. Ltd., New Delhi

Reference Books

1. Billings, M.P. (2016). *Structural Geology (III Edition)*, Pearson Publishers, 624p.
2. Dana, F.S (1955). *A Text Book of Mineralogy*, Asia Publishing House, Wiley.
3. Woods, H (1959). *Invertebrate Palaeontology*, Cambridge.
4. Krishnan, M. S (2003). *Geology of India and Burma (VI Edition)*, CBS Publishers and Distributors, Delhi.
5. Patwardhan, A.M (2010). *The Dynamic Earth System (II Edition)*, PHI Learning Private Ltd., New Delhi
6. Savindra Singh (2018). *Geomorphology*, Pravalika Publications, Allahabad
7. Thornbury, W.D (1969). *Principles of Geomorphology (Revised II Edition)*, 2015 Reprint, New Age International Pvt. Ltd. Publishers, New Delhi

Course Outcomes

At the end of the course the students would have acquired sufficient knowledge about

- The subject of Geology and its branches, components and origin of Solar System, Earth's interior, seas and oceans
- Weathering and its types, landforms produced by running water, wind and coastal processes
- The outline of plate tectonics, fault, fold, joints, unconformities, bedding in sedimentary rocks
- Fossils – their types and modes of preservation, morphological characteristics of important fossils, outline of Geological Time Scale
- Minerals and physical properties with special reference to quartz and feldspars, forms of igneous rocks, types of metamorphism, outline on the characteristics of some important rocks

Sem	Course Code	Course Title	Credit	Marks		
				I	E	T
V	U19NMGY2	GEOLOGY AND ENVIRONMENT Non Major Based Elective Course II	2	25	75	100

Course Objectives

To impart knowledge on

- Environment, ecology, natural resources and pollution
- Weathering and its types, causes, hazards and remedial measures relating to soil erosion, landslides and floods
- The outline on earthquakes, volcanic eruption and their hazards and remedial measures
- Causes and impacts of Coastal degradation, and the protective measures, causes and hazards pertaining to marine pollution, environmental problems relating to coral reefs and mangroves
- Environmental impacts relating to mining and mineral processing, urbanisation, desertification and the role of Man in environmental degradation

Unit 1: Definition of environment and ecology – Different ecosystems – Classification of natural resources – A short account of renewable and nonrenewable resources – Environmental pollution: causes and consequences with special reference to surface and groundwater

Unit 2: Environment problems due to surface geological processes: Weathering: types and products – Soil erosion: causes, hazards and remedial measures – Landslides: causes, hazards and remedial measures – Floods: causes, hazards and remedial measures

Unit 3: Influence of deep seated geological processes: Earthquake – origin, hazards, mitigation measures – Volcanoes: types, products, hazards mitigation measures of volcanic eruption

Unit 4: Degradation of coastal environment and measures for coastal protection - Marine pollution – Causes, hazards and remedial measures - Environmental problems relating to coral reefs and mangroves

Unit 5: Environmental impacts associated with mining and mineral processing – Urbanisation: causes and impacts – Desertification: causes and impacts – Man as an agent for environmental degradation.

Text Books

1. Keller, E.A (2012). *Introduction to Environmental Geology (V Edition)*, Pearson Prentice Hall, New York, 705p.
2. Montgomery, C.W (2011). *Environmental Geology (IX Edition)*, McGraw-Hill Pub., New York, 511p.

Reference Books

1. McConnell, R.L and D.C. Abel (2015). *Environmental Geology Today*, Jones and Bartlett Learning, Burlington, 844p.
2. Reichard, J.S (2011). *Environmental Geology*, McGraw Hill, New York, 545p.
3. Valdiya, K.S (1987). *Environmental Geology – Indian Context*, Tata McGraw Hill Publications, New Delhi, 583p.

Course Outcomes

At the end of the course the students would have acquired sufficient knowledge about

- Environment, ecology, natural resources and pollution
- Weathering and its types, causes, hazards and remedial measures relating to soil erosion, landslides and floods
- The outline on earthquakes, volcanic eruption and their hazards and remedial measures
- Causes and impacts of Coastal degradation, and the protective measures, causes and hazards pertaining to marine pollution, environmental problems relating to coral reefs and mangroves
- Environmental impacts relating to mining and mineral processing, urbanisation, desertification and the role of Man in environmental degradation



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.
 - Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards, Types of Fire, Firework and Safety

(8 lectures)

Unit: 6 **Social Issues and the Environment**

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

(7 lectures)

Unit: 7 **Human Population and the Environment**

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

Unit: 8 **Field Work**

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

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd

7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p
(M) Magazine (R) Reference (TB) Textbook
23. <http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules.%202004.pdf>.

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
HOURS: 2

COURSE CODE: U19SBE2
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 9814), 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.