NATIONAL COLLEGE (Autonomous)

POST GRADUATE AND RESEARCH DEPARTMENT OF ZOOLOGY

Under Graduate Programs Structure

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

Practical Examinations will be held only in the even semester. There will be an oral test for all Practical Examinations and Communicative English Courses. The Oral test will carry 5 marks in the external component. Int= internal, Extension activities=NCC, NSS, Red Ribbon Club, etc. programs offered by the College, Inst Hours= instruction hours, Sem = semester.

FIRST – YEAR

Sem	Part	Course	Course Title	Inst. Hrs/ Week	Credits	Exam Hours	Marks			
							Int	External		Total
								W	O	
I	I	Language Course- U19T1/U19H1/U19S1	Tamil/Hindi/Sanskrit	6	3	3	25	75	-	100
	II	English – I (U19E1)	English	6	3	3	25	75	-	100
	III	Core Course-I (U19ZY1)	Faunal Diversity-Invertebrates	5	5	3	25	75	-	100
		Core Course-II (U19ZY2P)	**Practical – I** (Faunal Diversity– Invertebrates, Faunal Diversity-Chordates)	3	-	*	-	-	-	-
		First Allied Course – I (U19ACH1)	Chemistry	5	3	3	25	75	-	100
		First Allied Course – II (U19ACH2P)	**Practical** –(Chemistry)	3	-	*	-	-	-	-
	IV	Environmental Studies Course (U19ES)	Environmental Studies	2	2	3	25	75	-	100
		Total		**30**	**16**					**500**
II	I	Language Course- U19T2/U19H2/U19S2	Tamil	6	3	3	25	75	-	100
	II	English –(U19E2)	English	4	2	3	25	75	-	100
		Communicative English Course –(U19CE1)		2	1	3	25	70	5	100
	III	First Allied Course –(U19ACH2P)	**Practical**–(Chemistry) **Practical**–(Chemistry)	3	3	3	25	70	5	100
		Core Course –(U19ZY2P)	**Practical – I** (Faunal Diversity– Invertebrates, Faunal Diversity-Chordates)	3	6	3	25	70	5	100
		Core Course-(U19ZY3)	Faunal Diversity-Chordata	5	5	3	25	75	-	100
		First Allied Course –(U19ACH3)	Chemistry	5	3	3	25	75	-	100
		Skill Based Elective course-I (U19SBE1)	Office Automation	2	2	3	25	75	-	100
		Total		**30**	**25**					**800**

SECOND – YEAR

Sem	Part	Course	Course Title	Inst. Hrs/ Week	Credits	Exam Hours	Marks			
							Int	External		Total
								W	O	
	I	Language Course- U19T3/U19H3/U19S3	Tamil	6	3	3	25	75	-	100
III	II	English– (U19E3)	English	6	3	3	25	75	-	100
	III	Core Course-(U19ZY4)	Cell and Molecular Biology	4	4	3	25	75	-	100
		Core Course – V (U19ZY5P)	**Practical – II** (Cell and Molecular biology, Physiology and Biochemistry)	3	-	*	-	-	-	
		Second Allied Course- I (U19AZY1)	Biology of Invertebrates and Chordates (for Botany students)	4	3	3	25	75	-	100
		Second Allied Course-II (U19AZY2P)	**Practical**- Pertaining to 2AC1 & 2AC3 for Botany Students	3	-	-	-	-	-	-
	IV	Skill based Elective course-II (U19SBE2)	**DTP**	2	2	3	25	75	-	100
		Skill based Elective course-III (U19SBE3P)	**Practical**	2	2	3	25	75	-	100
		Total		**30**	**17**					**600**
IV	I	Language Course- U19T4/U19H4/U19S4	Tamil	6	3	3	25	75	-	100
	II	English Language Course – (U19E4)	English	4	2	3	25	75	-	100
		Communicative English course – (U19CE2)	Communicative English	2	1	3	25	70	5	100
		Core Course – (U19ZY5P)	**Practical – II** (Cell and Molecular Biology, Physiology and Biochemistry)	3	5	3	25	70	5	100
		Core Course- (U19ZY6)	Physiology and Biochemistry	4	4	3	25	75		100
		Second Allied Course –(U19AZY2P)	**Practical** - (Pertaining to 2AC1 & 2AC3)	3	3	3	25	70	5	100
	III	Second Allied Course – (U19AZY3)	Economic Zoology (for Botany students)	5	3	3	25	75	-	100
	IV	Non Major Elective course-I (U19NMZYI)	Communicable Diseases	2	2	3	25	75	-	100
		Value Education course (U19VE)	Value Education	1	2	3	25	75	-	100
		Total		**30**	**25**					**900**

THIRD – YEAR

Sem	Part	Course	Course Title	Inst. Hrs/ Week	Credits	Exam Hours	Marks			Total
							Int	External		
								W	O	
	III	Core Course- (U19ZY7)	Developmental Biology	5	5	3	25	75	-	100
V		Core Course -(U19ZY8)	Microbiology and Immunology	5	5	3	25	75	-	100
		Major Based Elective course – (U19ZY9E)	Economic Entomology	5	4	3	25	75	-	100
		Major Based Elective course – (U19ZY10E)	Aquaculture	5	4	3	25	75	-	100
		Core Course –(U19ZY11P)	**Practical – III** pertaining to Core Courses 7 and 8 (Developmental Biology, Microbiology and Immunology)	3	-	*	-	-	-	-
		Core Course- (U19ZY12P)	**Practical – IV** pertaining to Core Courses 13,14 and 15 (Genetics and Evolution, Environmental Biology and Management, Biophysics and Biostatistics)	3	-	*	-	-	-	-
	IV	Non Major Elective course- (U19NMZY2)	Vermiculture	2	2	3	25	75	-	100
		U19SS	Soft skill	2	2		25	75		100
		Total		**30**	**22**					**600**
VI	**III**	Core Course –(U19ZY11P)	**Practical – III** pertaining to Core Courses U19ZY7 and U19ZY8	3	5	3	25	70	5	100
		Core Course- –(U19ZY12P)	**Practical – IV** pertaining to Core Courses U19ZY13, U19ZY14 and U19ZY15	3	6	3	25	70	5	100
		Core Course- –(U19ZY13)	Genetics and Evolution	6	6	3	25	75	-	100
		Core Course-–(U19ZY14)	Environmental Biology and Management	6	6	3	25	75	-	100
		Core Course-–(U19ZY15)	Biophysics and Biostatistics	6	6	3	25	75	-	100
		Major Based Elective (U19ZY16E)	Wildlife Biology and Nanobiology	5	4	3	25	75	-	100
	V	Gender Studies Course –(U19GS)	Gender Studies	1	1	3	25	75	-	100
		Extension Activities		-	1	-	-	-	-	-
		Total		**30**	**35**					**700**
		Grand 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 தரப்புள்ளிகள்: 3

கற்பித்தலின் நோக்கங்கள்

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
விக்ரமாதித்யன் - 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 பிரியதர்ஷினி

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 தரப்புள்ளிகள்: 3

கற்பித்தலின் நோக்கங்கள்

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

அலகு – 1: சைவ இலக்கியம்

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

அலகு – 2: வைணவ இலக்கியம்

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

அலகு – 3: பிற சமய இலக்கியங்கள்

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

அலகு – 4: புதினம்

துளசிமாடம் - நா.பார்த்தசாரதி.

அலகு – 5: இலக்கிய வரலாறு, இலக்கணம்

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

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

பாடநூல்

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

கற்பித்தலின் பயன்கள்

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

தேசியக்கல்லூரி (தன்னாட்சி), திருச்சிராப்பள்ளி – 620 001.
தமிழாய்வுத்துறை

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

U19T3

கற்பிக்கும் காலம்: 6 மணி

தரப்புள்ளிகள்: 3

கற்பித்தலின் நோக்கங்கள்

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

அலகு – 1:

சிலப்பதிகாரம் - அடைக்கலக்காதை
மணிமேகலை – ஆதிரை பிச்சையிட்ட காதை.

அலகு – 2:

கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்
பெரியபுராணம் - மெய்ப்பொருள் நாயனார் புராணம்

அலகு – 3:

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

அலகு – 4:

நாடகங்கள்:

1. விசுவநாதன் அல்லது கடமை முரண்.
2. மௌனதேசிகர் – பண்டித ம.கோபாலகிருஷ்ணய்யர்

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 மாவிசும்பு 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 – வெள்ளிவீதியார் – பாலை
3. கான மஞ்ஞை அறையீன் முட்டை – கபிலர் – குறிஞ்சி
4. வினையே ஆடவர்க்குயிரே வாணுதல் - பாலை பாடிய பெருங்கடுங்கோ – பாலை
5. ஆர்கலி ஏற்றொடு கார்தலை மணந்த – ஒக்கூர் மாசாத்தியார் – முல்லை

அலகு – 2:

அகநானூறு – (3 பாடல்கள் - 40, 48, 53)

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

கலித்தொகை – 2 பாடல்கள்

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

அலகு – 3:

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

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

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

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

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

அலகு – 4:

நெடுநல்வாடை (முழுவதும்).

அலகு – 5:

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

குறிப்பு: ஐந்து அலகுகளிலும் சம அளவில் வினாக்கள் அமைதல் வேண்டும்.

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

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

பகுதி அ - 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.

For Candidates to be admitted from the academic year **2019** onwards

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

For Candidates to be admitted from the academic year **2019** onwards

ENGLISH THROUGH EXTENSIVE READING – U19E2

SEMESTER : II **ENGLISH LANGUAGE**

COURSE : II

INSTRUCTION HOURS/WEEK : 4 **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.

For Candidates to be admitted from the academic year **2019** onwards

COMMUNICATIVE ENGLISH I – U19CE1

Semester : II **Communicative English Course : I**
Instruction Hours/ Week : 2 **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 : Conjuctions 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

For Candidates to be admitted from the academic year **2019** onwards

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

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

For Candidates to be admitted from the academic year **2019** onwards

COMMUNICATIVE ENGLISH II – U19CE2

SEMESTER : IV **COMMUNICATIVE ENGLISH COURSE : II**

INSTRUCTION HOURS/WEEK : 2 **CREDIT : 1**

The learner will be able to

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

UNIT I:

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

UNIT II:

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

UNIT III

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

UNIT IV:

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

UNIT V:

☐ Writing Skills – Note- taking, note- making, e-mail, Describing an object, narrating a story.

☐ Circulars

☐ Notes - reminders, warnings, farewells, apology.

☐ Draft invitations – marriage, annual day, inaugural functions of associations, valediction, seminar, workshop.

☐ Draft Short messages- compliments, birthday wishes, notifications

☐ Draft Posters- Slogans, Announcements

☐ Draft Advertisements

☐ Dialogue writing

Text Book

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

SYLLABUS
UG Part I – Hindi
Semester – 1

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

Objectives :

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

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

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

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

Unit V : **The Objective of teaching short stories is to enchance 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

For Candidates to be admitted from the academic year **2019** onwards

DEPARTMENT OF HINDI

For Candidates admitted from the Academic Year 2019 onwards

SEMESTER – 1

Course Code U19H1 **Credits – 3**

PaperI –FUNCTIONAL HINDI-1, PROSE, GRAMMARAND 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

For Candidates to be admitted from the academic year **2019** onwards

Semester – II

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

Objectives :

Unit I : The Objective of teaching comprehension is to incorporate self-reading and understanding.

Unit II : The Objective of teaching grammar is to acknowledge the basic rules of the grammatical structures.

Unit III : The Objective of teaching Literature is to acquire the knowledge of the origin of Hindi in literature.

Unit IV : The Objective of teaching one act play is to help the learners to understand the method of acting and writing a play.

Unit V : The Objective of teaching Drama is to acknowledge the basic dramatic structures.

Program Outcome :

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

SEMESTER - II

COURSE CODE : U19H2 **6hrs/wk**

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

Unit – 1 **Comprehension**

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

Unit – II **Grammar**

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

Unit – III **Hindi Literature**

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

Unit – IV **One act play**

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

Unit – V **Drama**

1. Swarg ke Jalak (Upendranath Ashak)

DEPARTMENT OF HINDI

For Candidates admitted from the Academic Year 2019 onwards

U19H2

SEMESTER – II

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

Comprehension

Prescribed Text Book

Adhunik Hindi Nibandhavali - Praveshika Book
Hindi Prachar Pushtakmala, Madras.

Prescribed Lessons

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

One Act Play

Hindi Sahith Rastrabhasha patya saamgri
O.No.1636 Hindi Prachar Pushtakmala, Pushpa-507

1. Andheri Nagari – Bharatendu Harishchandra
2. Reed ki Haddi – 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

For Candidates to be admitted from the academic year **2019** onwards

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 souce 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 kovoon (Sumitranandan Pant)
3. Kilona (Chiyaram Saran Gupta)

Unit – V **Translation**

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

For Candidates to be admitted from the academic year **2019** onwards

DEPARTMENT OF HINDI

For Candidates admitted from the Academic Year 2019 onwards

U19H3

SEMESTER – III

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

Couplets

Prescribed Text Book

Kavya Sourab - Hindi Prachar Pushtakmala, Pushpa- 437

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

Prescribed couplet

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

Poetry

Prescribed Book

Vasanth III

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

Prescribed Poem

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

Dialogue Writing

Hindi Vataayan – Dr. K.M.Chandra Mohan

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

Hindi Literature

Bhakthi Kaal (Introduction, Specialities, Famous Poets)

Prescribed Book

Hindi Sahithya ki Pravirthiya – Dr. Jaykisan Prasad

Translation

Subodh Hindi Patmala – 1

Hindi Prachar Sabha,Madras.

Prescribed Lessons

Lesson 6 to 10

Homonyms

Synonyms

Semester – IV

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

Objectives :

Unit I : **The Objective of teaching letter writing is to improve their communication skills through writing letters in formal and informal way.**

Unit II : **The Objective of teaching Modern Era in Hindi literature to acquire the knowledge of various subjects which was used in pre independence and post independence and also in recent years.**

Unit III : **The Objective of teaching Street play is to introduce theatre arts and the origin of today's theatre.**

Unit IV : **The Objective of teaching Technical words and phrases is to develop their writing skill. Writing essay will develop their creativity. The learners were encouraged to summarise a passage through precise writing.**

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	१। संस्कृत भाषा - प्रास्ताविकम्
संस्कृतभाषा देवनागरीलिपिः च - परिचयः	२। अक्षराभ्यासः, वर्णाः,
कर्तृपद-परिचयः	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;मध्यमपुरुषः,उत्तमपुरुषः च
	२। एकवचनम्, बहवचनं च
	३। क्रियापदानि - गम् (गच्छ्), पिब्,पठ्, क्रीड्, वद्
2. पुल्लिङ्ग-कर्तृपदानि सर्वनामपदानि च	१। बालकः, शिक्षकः, अध्यापकः, नृपः, देवः, मनुष्यः, हस्तः अलसः कुशलः, अहम् ,त्वं, सः।
3. नपुंसक-लिङ्ग-कर्तृपदानि	१। पुस्तकम्, फलम्, दुग्धम्, घृतम्, उद्यानम्, पुष्पम्, जलम्, मधुरम्, कन्दुकम्, भोजनम्।
4. अव्ययानि	१। तत्र, कुत्र, यत्र, अत्र, न, तदा, कदा, यदा-तदा, शीघ्रं, द्रुतम्, 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	उपर्युक्त-कर्तृ-क्रियापदानि वाक्येषु उपयोगः, अनुवाद-अभ्यासः च।
2. विभक्तीनां परिचयः	१। प्रथमा विभक्तितः - 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।
3. प्रश्न-निर्माण-पदानि	किम्, कुत्र, कथं, किमर्थम्, कुतः,कदा।
4. क्रियापदानि(लट्)	वर्तमानकाले भू (भव्) अस्, धाव् , कृ (कर्) अस्, धाव्, पत्, आ-गम् (गच्छ्)।
5. अनुवाद-अभ्यासः	आङ्गलात् संस्कृते/ संस्कृतात् आङ्गले

Unit IV

1. विशेषण-विशेष्यौ	१। रङ्गाः -शुक्ल-नील-पीत-रक्त-हरित-कपिश-चित्र-भेदाः। तथा अन्यानि सरलपदानि २। तेषां विशेणेषु उपयोगः
2. संख्यावाचकपदानि	१। संस्कृते संख्यावाचकपदानि (0 त। १० पर्यन्तम्।
3. सर्वनामपदानि	१। तद् शब्दः - पुल्लिङ्ग-स्त्रीलिङ्ग-नपुंसकलिङ्गाः २। अस्मद् - युष्मद् शब्दौ। ३। एतद् शब्दः - त्रिषु लिङ्गेषु
4. भविष्यत्काले क्रियापदानि (लृट् लकारः)	१। गम् (गच्छ्), पठ्, वद, पत्, लिख्, क्रीड्, आ-गम्(गच्छ्), भू (भव्), धाव्, पा(पिब्), दृश्(पश्य्), कृ (कर्)।
5. भोज्यपदार्थनामानि	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, निस्ज़्-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.
(Omittted 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.

For Candidates to be admitted from the academic year **2019** onwards

NATIONAL COLLEGE (AUTONOMOUS)

LANGUAGE COURSE PART I SANSKRIT SEMESTER II PAPER II SANSKRIT II

(For the candidates admitted from June 2019 onwards)

SYLLABUS

SUBJECT CODE: U19S2

Unit I

1. पुनश्चर्या	गतषाणंमासे अभ्यस्तानाम्
2. कर्तृपदानां परिचयः	१। इकारान्तः पुल्लिङ्गः कविशब्दः केचन समानान्त-शब्दः च। २। सर्वनामशब्दः - तद् - स्त्रीलिङ्गे ३। इकारान्तः स्त्रीलिङ्गः मतिशब्दः, केचन समानान्त-शब्दाः च। ४। एतेषां वाक्येषु उपयोगः, अनुवाद-अभ्यासः च।
3. क्रियापदानि वर्तमानकालः (लट्)	१। जप्, चर, रक्ष्, हस्, वम्, नम्, दह्, तप्, वस्, इच्छ्, वाञ्च्छ्, शंस्, त्यज्, जल्प, निन्द्, 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 सह्, स्वद्, बाध्, भाष्, भास् २। पूर्वोक्त-कर्तृपदानि क्रियापदानि च वाक्येषु उपयोगः ३। अनुवाद-अभ्यासः
3. आत्मनेपदिनः धातवः (लट् क्रियापदानि)	१। भाष्, यत्, लभ्, रम्, क्षम्, त्रप्, सह्, स्वद्, भास् २। संवादः - अभ्यासः

Unit III

1. भूतकालः (लङ्)

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

2. प्रेरणार्थकं क्रियापदम् (भविष्यत्) लोट्

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

Unit IV

1. सन्धिप्रकरणम्

१। यण् सन्धिः
२। अयादिसन्धिः

2. नूतन-कर्तृपदानि (पुल्लिङ्गः)

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

३। नूतन-कर्तृपदानि (स्त्रीलिङ्गः)

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

4. कथालेखनम्

१। पाठ्यक्रम-अन्तर्गत-कथा

२। नूतन-कर्तृपदानि (कथा-अन्तर्गतानि)

Unit V

1. नूतन-प्रत्ययाः

१। क्तवतु प्रत्ययः- क्तप्रत्ययः

२। कर्तरि प्रयोगः कर्मणि प्रयोगः च

३। सन्नन्ताः - इच्छाप्रकृतिः(Desiderative)

2. नूतन-क्रियापदानि

१। प्रथ्, प्री, बन्द्, भूष्, मृज् (मार्ज्), युज्, रच्, स्निह्, हिंस् (लट् परस्मैपदि, आत्मनेपदि)

२। उपरि अभ्यसित-धातु तथा प्रत्ययान् वाक्येषु उपयोगः

३। संभाषणम् - कालिदासकृतं अभिज्ञानशाकुन्तलम्।

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

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

2. Lesson 4, श्लोकः (page 23)

3. Lesson 10, सुभाषितानि, संस्कृत-लोकोक्तयः)

References:

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

2. संस्कृतबोधिनी, प्रथमा , संस्कृतभाषाप्रचारिणि सभा, चित्तूर्, आन्ध्रप्रदेश ५०७५०१ 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
लॊट् लकारे परस्मैपदि, आत्मनेपदि च
२। इतोऽपि अव्ययानि
३। कथालेखनप्रकारः
४। अनुवादः
५। उपसर्गाः
६। तेषां वाक्येषु उपयोगः

Unit III

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

Unit IV

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

Unit V

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

Prescribed books: 1. Saral Sanskrit Sikshak, Part III, Bharatiya Vidya Bhavan, Mumbai 400007.
Omitted portions:1. Lesson 9 सीतायाः स्वयंवरः
2. Lesson 11, सुभाषितानि, संस्कृत-लोकोक्तयः

References:
1. Samskrita-vyavaharasahasri, Samskrita Bharati, Bengaluru 85
2. Angala-samskrita kosha, Samskrita Bharati, Bengaluru 85.

For Candidates to be admitted from the academic year **2019** onwards

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-समसः
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। दत्तनि पदानि विचित्य पञ्चवाक्येषु एकम् अनुच्छेद-लेखनम्।
२। सरलकथा अथवा गद्यांशयुक्तम्।

4. रचनालेखनम् (पाठ्यपुस्तक-अन्तर्गतम्)

१। सरलकथा
२। गद्यांशः

UNIT V

1. श्रेष्ठभाषा द्रविडभाषा - अस्याः ऐतिहासिहं स्थानम्।

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

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

(Omitted portions:

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

References:
1. संस्कृतव्यवहारसाहस्री, संस्कृतभारती, बेङ्गलूरु ५६००८५।
2. संस्कृतबोधिनी (द्वितीया), संस्कृतभाषाप्रचारिणी सभा, चित्तूर्, आन्ध्रप्रदेशः५१७५०१।

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**I – B.Sc., Zoology**	
Semester	**I**	
Course & Code	**Core course – (CC1)**	**Code: U19ZY1**
Course Title	**FAUNAL DIVERSITY (INVERTEBRATES)**	
Hours: 5	Credits : 5	Max Marks : 75

Course Educational Objectives

CEO1. To understand the basis of life processes in Protozoa
CEO2. To understand the basis of life processes in Porifera and Coelenterata
CEO3. To understand the basis of life processes in Platyhelminthes and Aschelminthes
CEO4. To understand the basis of life processes in Annelida and Arthropoda
CEO5. To understand the basis of life processes in Mollusca and Echinodermata

UNIT - I : ANIMAL KINGDOM AND PROTOZOA

Outline classification of animal kingdom, General characters and classification up to class level with examples for Protozoa.
Detailed Study: *Paramecium caudatum* (Slipper Animalcule).
General Topics: Protozoan parasites, Economic importance of protozoans.

UNIT - II : PORIFERA AND COELENTERATA

General characters and classification up to class level with examples for Porifera and Coelenterata
Detailed study: *Obelia longissima* (Sea fur).
General topics: Canal system in sponges, Coral and coral reefs

UNIT - III : PLATYHELMINTHES AND ASCHELMINTHES

General characters and classification up to class level with examples for Platyhelminthes and Aschelminthes
Detailed study : *Taenia solium* (Tape worm).
General topics: Parasitic adaptations of Aschelminthes and Platyhelminthes, Parasites of Aschelminthes (*Ascaris lumbricoides, Wuchereria bancrofti, Loa Loa)* and *Platyhelminthes (Fasciola hepatica, Schistosoma haematodium, Echinococcus granulose).*

UNIT - IV : ANNELIDA AND ARTHROPODA

General characters and classification up to class level with examples for Annelida and Arthropoda.
Detailed study: *Penaeus monodon* (Black Tiger Shrimp).
General topics: Adaptive Radiation in Annelida, Beneficial and harmful insects.

UNIT - V : MOLLUSCA AND ECHINODERMATA

General characters and classification up to class level with examples for Mollusca and Echinodermata.
Detailed study : *Pila globosa* (Apple Snail).
General topics: Larval forms of Echinoderms (Dipleurula, Bipinnaria, Brachiolaria, ophiopluteus, echinopluteus, Auricularia, Doliolaria of Holothuroidea, Doliolaria of Crinoidea, pentacrinoid), Water-vascular system of Starfish.

Course Outcomes

CO1. Learn the evolution, hierarchy and classification of Invertebrates
CO2. Familiar with the life processes of various invertebrates
CO3. Familiar with the invertebrate biodiversity
CO4. Familiar with the adaptations of invertebrates
CO5. Familiar with the economic importance of invertebrates

Text book

1. Nair. N.C., S. Leelavathy, N. Sundarapandiyan, T. Murugan and N. Arumugam 2014. A Text book of Invertebrates. SARAS Publication, Nagercoil.
2. Ayyar, E. K. and T. N. Ananthakrishnan, 1992. A Manual of Zoology, Vol-I (Invertebrata) Parts I & II, Viswanathan Pvt. Ltd.,

Reference Books:

1. Barrington, E.J.W. 1979, Invertebrates Structure and Function. Ed ELBS and Nelson.
2. Hyman, L.H., 1940-1955, The Invertebrates, Vol – I to VII McGraw Hill Book Co.
3. Jordon, E.L. and P.S. Verma 1995, Invertebrate Zoology, 12th Edn. S.Chand & Co.
4. Kotpal, R.L., S.K. Agarwal, R.P.R.Khetarpal. 1989. Modern Text Book of Zoology, RostoGi Publications.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**I – B.Sc., Zoology**	
Semester(s)	**I & II**	
Course & Code	**Core course – (CC 2)**	**Code: U19ZY2P**
Course Title	**MAJOR PRACTICAL – I** **FAUNAL DIVERSITY (INVERTEBRATES & CHORDATES)**	
Hours: 6 (3+3)	Credits : 6	Max Marks : 75

Course Educational Objectives

CEO1. Gain experience in anatomy through simple dissections (commercially available dead animals) and virtual mode

CEO2. Learn the mounting techniques and organ system through prepared-slides

CEO3. Lear the organ systems through preserved specimen

CEO4. Learn the organ system through commercially available animals.

CEO5. Learn the economically important invertebrates and vertebrates

Dissection

Earthworm : Nervous system
Prawn : Nervous system
Fish/ : Various systems through virtual
Frog/Chicken/ mode

Mounting

Earthworm : Body setae, Penial setae
Prawn : Appendages

Spotters and slides

Protozoa : Paramecium
Porifera : Sycon
Coelenterata : Obelia (entire), Physalia, Obelia medusa, Porpita, Sea anemone,Aurelia.
Platyhelminthes : Liver fluke, Planaria, Tapeworm, and Scolex
Nemathelminthes : Ascaris (Male and Female).
Annelida : Nereis, Parapodium, Heteronereis, Trochophore larva, Arenicola,:Leech.
Arthropoda : Penaeus, Sacculina on crab, Peripatus, Limulus, Alima larva. Artemia, Cyclops.
Molluscs : Pila
Echinodermata : Starfish

Chordates

Mounting

Placoid, cycloid, and ctenoid scales

Spotters:

Prochordata : Amphioxus, Balanoglossus.
Fishes : *Catla catla*, Shark, Echeneis, Hippocampus, Exocoetus.
Amphibia : Bufo, Hyla, Ichthyophis.
Reptilia : Crocodile, Naja naja, Tortoise, Monitor Lizard,
Aves : Pigeon, Types of Feathers.

Mammalia	: Rabbit, Bat
Dentition	: Rabbit, Man

Field study:
Collection and preservation techniques of Insects: Demonstration
Collection and preservation of Marine/freshwater fauna: Demonstration
Identification commercial Marine/Freshwater Fishes: Demonstration

A record of lab work should be maintained and submitted at the time of practical exam.

Course Outcomes

CO1. Familiar with the dissections (commercially available dead animals)
CO2. Familiar with the virtual dissection
CO3. Familiar with the mounting techniques
CO4. Familiar with the anatomy of organism
CO5. Familiar with the economically important invertebrates and vertebrates

Text Books:

1. P.S. Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S. Chand & Co.)
2. S.S. Lal 2004. Practical Zoology : Chordates (Rastogi Publications)

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**I – B.Sc., Zoology**	
Semester	**II**	
Course & Code	**Core course – (CC3)**	**Code: U19ZY3**
Course Title	**FAUNAL DIVERSITY (CHORDATA)**	
Hours: 5	Credits : 5	Max Marks : 75

Course Educational Objectives

CEO1. Learn the diversity in form, structure and habits of Prochordates
CEO2. Learn the diversity in form, structure and habits of Pisces
CEO3. Learn the diversity in form, structure and habits of Amphibians and Reptiles
CEO4. Learn the diversity in form, structure and habits of Birds
CEO5. Learn the diversity in form, structure and habits of Mammals

UNIT - I: PROCHORDATA

General characters and classification of chordates up to order level with examples.
Detailed Study: Amphioxus- *Branchiostoma lanceolatus*
General Topics: Retrogressive metamorphosis in Ascidia, Affinities of Balanoglossus.

UNIT - II: PISCES

General characters and classification up to subclass with examples.
Detailed Study: - Shark- *Scoliodon sorrakowah* (Excluding endoskeleton)
General Topics: Migration in fishes, Accessory respiratory organs in fishes.

UNIT - III: AMPHIBIA AND REPTILIA

General characters and classification up to order with examples for Amphibia.
General characters and classification up to order with examples for Reptilia.
Detailed Study : Frog -*Rana hexadactyla* (Excluding endoskeleton)
General Topics : Parental care in Amphibia, Mesozoic reptiles.

UNIT - IV: AVES

General characters and classification up to order with examples.
Detailed Study : Pigeon- *Columba livia* (Excluding endoskeleton)
General Topics : Migration in birds, Beak and feet adaptation in birds.

UNIT - V: MAMMALIA

General characters and classification up to sub class with examples.
Detailed Study : Rabbit- *Oryctolagus cuniculus* (Excluding endoskeleton)
General Topics : Origin of mammals, Aquatic mammals.

Course Outcomes

CO1. Familiar with the classification and life process of Prochordates
CO2. Familiar with the classification and life process of Pisces
CO3. Familiar with the classification and life process of Amphibians and Reptiles
CO4. Familiar with the classification and life process of Birds
CO5. Familiar with the classification and life process of Mammals

Text books:

1. Ekambaranathan Ayyar, I , 1993 – Outlines of Zoology – Vol – II Viswanathan Pvt. Ltd.
2. Nair. N.C., S. Leelavathy, N. Sundarapandiyan, T. Murugan and N. Arumugam 2014. A Text book of Invertebrates. SARAS Publication, Nagercoil.

Reference Books :

1. Kardong, K.V. (2005) Vertebrates Comparative Anatomy, Function and evolution. IV Edition. McGraw3 Hill Higher Education.
2. Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition. The McGraw3Hill Companies.
3. Young, J.Z. (2004). The life of vertebrates. III Ed ition. Oxford university press.
4. Hall B.K. and Hallgrimsson B. (2008). Strickberger' s Evolution. IV Edition. Jones and Bartlett Publish ers, Inc.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Zoology**	
Semester	**III**	
Course & Code	**Core course – (CC4)**	**Code: U19ZY4**
Course Title	**CELL AND MOLECULAR BIOLOGY**	
Hours: 4	Credits : 4	Max Marks : 75

Course Educational Objectives

CEO1. To understand the structure of Prokaryotic cell and Eukaryotic cell
CEO2. To understand the structure and function of Golgi complex, Lysosomes and Mitochondria.
CEO3. To understand the structure and function of Chromosomes, Nucleus and RNA
CEO4. To understand the DNA, mitosis, meiosis, and gene
CEO5. To understand the basics of biotechnology

UNIT – I

Cell structures: Prokaryotes and Eukaryotes.
Plasma membrane: Fluid mosaic model, structure, and functions.
Endoplasmic reticulum: Structure, Types, and Functions.

UNIT – II

Golgi complex: Ultrastructure, and functions.
Lysosomes: Origin, Ultrastructure, and functions
Mitochondria : Origin, Ultrastructure and functions.

UNIT – III

Ribosomes : Structure and functions.
Nucleus: Ultrastructure and functions.
Chromosomes: Ultrastructure and functions.
RNA: Types, structure and function.

UNIT – IV

DNA : Molecular structure, types and functions.
Mitosis and Meiosis.
Genetic code and Protein synthesis.

UNIT – V

Principles and methods of gene cloning, application.
Gene Cloning Vectors**:** Plasmids- pBR322, Cosmids PJB 8, SV-40.
Recombinant DNA Technology: Gene library, Transformation, Transduction, Blotting techniques: Southern, Northern, Western.
Gene therapy.

Course Outcomes

CO1. Familiar with Prokaryotic and Eukaryotic cell.
CO2. Familiar with the structure and functions of Golgi complex, Lysosomes, and mitochondria
CO3. Familiar with the structure and function of Chromosomes, Nucleus and RNA
CO4. Familiar with the DNA, mitosis, meiosis, and gene
CO5. Familiar with the basics of biotechnology

Text book

1. Verma, P.S. and V.K. Agarval.2009. Cell biology, genetics, molecular biology , evolution and ecology. S. Chand & Co
2. Meyyan R.P. 2005. Cell Biology, Saras Publications.
3. Arumugam, N. 2005. Biotechnology. Saras Publications

Reference Books:

1. De Roberties, E.P.P. and E.M.F. De Roberties 1987. Cell and Molecular Biology
2. Power, C.B., 1989. Essentials of Cytology. Himalaya Publishing House.
3. Tomar & Singh, 1999. Cell Biology. Rastogi Publication, Meerut.
4. Darner, Lodish and Baltimore 1990. Molecular Cell Biology, II Ed.
5. Watson *et al*., 1987. Molecular Biology of the Gene.
6. Shukla 2005. Histological Techniques
7. Balasubramanian, D. 1996. Concepts of Biotechnology. University Press (India) Ltd. Hyderabad.
8. Brown, T.A. (1998). Molecular Biology Labfax II: Gene Cloning and DNA Analysis. II Edition, Academic Press, California, USA.
9. Glick, B.R. and Pasternak, J.J. (2009). Molecular Biotechnology - Principles and Applications of Recombinant DNA. IV Edition, ASM press, Washington, USA.
10. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). An Introduction to Genetic Analysis. IX
11. Snustad, D.P. and Simmons, M.J. (2009). Principles of Genetics. V Edition, John Wiley and Sons Inc.
12. Dubey, R.C. 2008. A Text Book of Biotechnology, S. Chand & Co, New Delhi.
13. Kumaresan, V., 2006. Biotechnology, Saras Publication, Nagercoil.
14. Gupta, P.K. 2006. Elements of Biotechnology, Rastogi Publications, Meerut.
15. Lewin, B. 2002. Gene XI, Oxford University Press, New York.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Zoology**	
Semester	**III & IV**	
Course & Code	**Core Course – (CC5)**	**Code: U19ZY5P**
Course Title	**MAJOR PRACTICAL – II** (Pertaining to Cell and Molecular Biology, Physiology and Biochemistry)	
Hours: 3+3	Credits : 5	Max Marks : 75

Course Educational Objectives

CEO1. Understand the microtechniques
CEO2. Able to distinguish different cells & muscle types
CEO3. Abe to enumerate RBC &WBC and measure pH
CEO4. Able to do physiological and biochemical tests
CEO5. Understand the functional aspects of SEM, HPLC, AAS

Cell and Molecular Biology

1. Onion root tip – squash preparation and study of mitosis.
2. Spotters : Columnar, Ciliated, Squamous epithelium, Cardiac, Striated, Non-striated Muscle, Nerve cell, Blood of Man and Frog, Compound microscope, Centrifuge, Micrometer, Camera Lucida, Microtome.
3. Isolation of DNA (Demonstration only)
4. DNA amplification (Demonstration only)
5. Spotters: Bioreactor, Plasmid (PBR^{322}, SV^{40}), PCR.

Physiology

1. Enumeration of RBC and WBC.
2. Qualitative tests for ammonia, urea and uric acid.
3. Spotters: Haemoglobinometer, Kymograph, Sphygmomanometer.

Biochemistry

1. Qualitative tests for proteins, carbohydrates and lipids
2. pH measurement of various samples using pH meter and pH paper

Demonstration: SEM, HPLC, AAS at NCIF

Demonstration: Whole mount preparation-Killing, fixing, staining, permanent/temporary mounting Histological preparation-Collection of tissue, washing, Dehydration, clearing, infiltration, sectioning, staining.

A record of lab work should be maintained and submitted at the time of the practical examinations.

Course Outcomes

CO1. Familiar with the microtechniques
CO2. Familiar with various cell & muscle types
CO3. Familiar with the blood test
CO4. Familiar with physiological and biochemical tests
CO5. Familiar with the SEM, HPLC, AAS

Text Books:

1. P.S. Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S. Chand & Co.)
2. K.C.Ghose abd B.Manna 2004. Practical Zoology : New central book agency

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Allied Zoology (For Allied Students)**		
Semester	**III**		
Course & Code	**Second Allied Course – (2AC1)**	**Code: U19AZY1**	
Course Title	**BIOLOGY OF INVERTEBRATES AND CHORDATES**		
Hours: 4	Credits : 3	Max Marks : 75	

Course Educational Objectives

CEO1. Understand the Invertebrates and Vertebrates with basis of Systematic
CEO2. Understand the life processes of paramecium
CEO3. Understand the life processes of Prawn
CEO4. Understand the life processes of Shark
CEO5. Understand the life processes of Rabbit

UNIT – I

General characters of invertebrates.
Outline classification of invertebrates up to class.
General characters of chordates.
Outline classification of chordates up to order.

UNIT – II

Detailed study of *Paramecium caudatum* -Slipper animalcule): External features, Nutrition, locomotion and reproduction

UNIT – III

Detailed study of prawn (*Penaeus monodon* - Tiger Shrimp): External features, digestive system, respiratory system, nervous system and reproductive system

UNIT – IV

Detailed study of Shark : External features, respiratory system, circulatory system, urinogenital system.

UNIT – V

Detailed study of Rabbit : External features, digestive system, respiratory system, circulatory system, urinogenital system.

Course Outcomes

CO1. Familiar with the classification of Invertebrates and Vertebrates
CO2. Familiar with the life processes of Paramecium
CO3. Familiar with life processes of Prawn
CO4. Familiar with the life processes of Shark
CO5. Familiar with the life processes of Rabbit

Text books:

1. Ekambaranatha Ayyar, M. 1988. Outlines of Zoology. Viswanathan Publications.
2. Ekambaranatha Ayyar, M. 1988. A Manual of Zoology, Vol. I & II. Viswanathan Publications.
3. Arumugam. N. Outlines of Zoology, 1998. Saras Publications.

References:

1. Nair, N.C. 2006. A Text Book of Invertebrates, Saras Publications, 3rd Ed.
2. Jordan, E.L. 2000. Invertebrate Zoology. S.Chand and Co.
3. Jordan, E.L. 2000. Chordate Zoology. S.Chand and Co.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Allied Zoology (For Allied Students)**	
Semester	**III & IV**	
Course & Code	**Second Allied Course – (2AC2)**	**Code: U19AZY2P**
Course Title	**ALLIED PRACTICAL** (Pertaining to Biology of Invertebrates & Chordates and Economic Zoology)	
Hours: 3+3	Credits : 3	Max Marks : 75

Course Educational Objectives

CEO1. Learn the simple dissection technique
CEO2. Learn the virtual dissection technique
CEO3. Learn the mounting technique
CEO4. Learn the organ system through preserved specimen and permanent slides
CEO5. Learn the importance of animal products

1. Dissections (commercially available dead animals)

Earthworm	:	Nervous system
Frog	:	General Anatomy (Virtual laboratory)

2. Mountings

Earthworm	:	Body and Penial setae
Shark	:	Placoid scale

3. Spotters

Paramecium, Simple sponge - Ascon, Obelia colony, Sea anemone, Ascaris, *Fasciola hepatica*, *Taenia solium*, Earthworm, Leech, Prawn, Scorpion, Grass hopper, Fresh water mussel, Pila, Starfish, Amphioxus, Shark, Catla, Frog, Calotes, *Naja naja*, Pigeon, Rat and Bat.

4. Species of animals used in Vermiculture, Apiculture, Lac-culture, Sericulture, Aquaculture and Poultry farming.

5. Products: Honey, Bee's Wax, Silk, Cod liver oil, Pearl, Bird's egg.

A record of lab work should be maintained and submitted at the time of practical exam

Course Outcomes

CO1. Familiar with dissection technique
CO2. Familiar with virtual dissection technique
CO3. Familiar with mounting technique
CO4. Familiar with the organ system through spotters/slides
CO5. Familiar with the animal products and their economic importnace

Text Books:

1. P.S. Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S.Chand & Co.)
2. S.S. Lal 2004. Practical Zoology : Chordates (Rastogi Publications)

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Zoology**		
Semester	**IV**		
Course & Code	**Core Course – (CC6)**	**Code: U19ZY6**	
Course Title	**PHYSIOLOGY AND BIOCHEMISTRY**		
Hours: 4	Credits : 4	Max Marks : 75	

Course Educational Objectives

CEO1. To understand the physiology of digestion, respiration and circulation
CEO2. To understand the physiology of nerves and endocrine glands
CEO3. To understand the physiology of muscle and excretion
CEO4. To understand the metabolism of protein, carbohydrate and lipid
CEO5. To understand the enzymes and vitamins

UNIT – I

Nutrition : Types.
Digestion and absorption in Man.
Respiration : Transport of O_2 and CO_2 in man
Circulation : Blood composition, Origin and Conduction of heart beat in man.

UNIT – II

Nerve physiology: Neuron, Types, Neurotransmitters, Impulse transmission, Synapse, Synaptic transmission, Reflex action.
Endocrine physiology : Endocrine glands in man, Secretion and Disorders.

UNIT – III

Muscle physiology : Types of muscles, Ultrastructure of muscle fibre, Physiology of muscle contraction.
Excretion : Types of nitrogenous wastes, Structure of mammalian kidney and Urine formation.

UNIT – IV

Classification: Carbohydrates, Proteins and Lipids
Kreb's cycle, Protein metabolism and Lipid metabolism.

UNIT – V

Enzymes: Classification, Characteristics, Mode of action, Theories, Factors affecting enzyme action.
Vitamins : Types, Sources, Functions and Deficiency diseases.
Calorific values, Balanced diet.

Course Outcomes

CO1. Familiar with the physiology of digestion, respiration, and circulation
CO2. Familiar with the physiology of nerves and endocrine glands
CO3. Familiar with the physiology of muscle and excretion
CO4. Familiar with various biochemical pathways
CO5. Familiar with the enzymes and vitamins

Text books:

1. Veerakumari. L. 2008. Biochemistry, MPJ Publications.
2. Agarwal, R.A.A.K. Srivastava and Kaushal Kumar, 2005. Animal Physiology and Biochemistry. S. Chand & Co New Delhi.

Reference Books:

1. Berry A.K. 1998. A text book of Animal Physiology. Emkay Publications, New Delhi – 51.
2. Hoar, W.S. 1983. General and Comparative Physiology. Printice Hall of India.
3. Nagabushanam R. 1991. Animal Physiology. S. Chand & Co.
4. Harper, H.A. 1993. Review of Physiological Chemistry. Muruzen Ascian Ed.
5. LehningerL.,1990.Biochemistry. W.H.Freeman&Co.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., Allied Zoology (For Allied Students)**	
Semester	**IV**	
Course & Code	**Second Allied Course – (2AC3)**	**Code: U19AZY3**
Course Title	**ECONOMIC ZOOLOGY**	
Hours: 5	Credits : 3	Max Marks : 75

Course Educational Objectives

CEO1. To understand the prawn culture techniques
CEO2. To understand the pearl culture techniques
CEO3. To understand the sericulture techniques
CEO4. To understand the fish culture techniques,
CEO5. To understand the poultry farming techniques

UNIT – I

Fresh water Prawn culture – Preparation of farm – Reproduction – Seed collection and Transport. Management of production pond – stocking – supplementary feeding – methods of prawn fishing.

UNIT – II

Pearl culture: Technical requirements, Process and Methods: Species used-selection of farm sites, construction of farm,seeding, caring the oyster, sorting the perals.

UNIT – III

Sericulture : Types of silkworm, Rearing techniques, moriculture.
Diseases: Muscardine, Pebrine.
Life cycle of silk worm (*Bombyx mori*). Economic importance of silk.

UNIT – IV

Fish culture: Catla, Rohu, Live feed culture (Rotifers and Copepods), Induced breeding, Fish diseases: Protozoan White spot, Fungal Gill Rot.
Fish byproducts.

UNIT – V

Poultry farming: Types of poultry, Fowl house construction, poultry nutrition, Diseases : Fowlpox and Ranikhet, Economic importance of poultry farming.

Course Outcomes

CO1. Aware the entrepreneurial opportunities in prawn culture
CO2. Aware the entrepreneurial opportunities in pearl culture
CO3. Aware the entrepreneurial opportunities in sericulture
CO4. Aware the entrepreneurial opportunities in fish culture
CO5. Aware the entrepreneurial opportunities in poultry farming

Text Book

1. Arumugam, N. 2008. Aquaculture, Saras Publications.

Reference Books:

1. Shukla, G.S. and V.B. Upadhyay 2003 Economic Zoology, Rastogi publications.
2. Ahsan, J. and S.P. Shiha 2005 A hand book of Economic Zoology, S. Chand & Co.

3. Sardar Singh – Bees keeping in India.
4. Santhanam – 1991. Aquaculture
5. Sundarraj, V. 1997. Aquaculture, TANUVAS.
6. Singh – Live stock and poultry production.
7. Rama Rao, V., 2004, Poultry Science, Mangal Deep Publications.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**II – B.Sc., (Other than Zoology Students)**	
Semester	**IV**	
Course & Code	**Non Major Elective course – (NME:1)**	**Code: U19NMZY1**
Course Title	**COMMUNICABLE DISEASES**	

Hours: 2	Credits : 2	Max Marks : 75

Course Educational Objectives

CEO1. To understand the air borne diseases
CEO2. To understand the food and water borne diseases
CEO3. To understand the insect borne diseases
CEO4. To understand the sexually transmitted diseases
CEO5. To understand the viral diseases

UNIT – I

Air borne diseases: Measles, Mumps, Small pox, Tuberculosis, Pneumonia, Diphtheria, Meningitis – Symptoms, Prophylaxis and Control measures.

UNIT – II

Food and water borne diseases: Cholera, Botulism, Typhoid, Amoebiasis, Tetanus - Symptoms, Prophylaxis and Control measures.

UNIT – III

Insect borne diseases: Yellow fever, Dengue fever, Malaria, Elephantiasis, Sleeping sickness - Symptoms, Prophylaxis and Control measures.

UNIT – IV

Sexually transmitted diseases: Gonorrhea, Vaginitis, Syphilis, Chlamydia, Trichomoniasis - Symptoms, Prophylaxis and Control measures.

UNIT – V

Viral hepatitis, Influenza, Polio, Rabies; Cold sores and AIDS - Symptoms, Prophylaxis and Control measures.

Course Outcomes

CO1. Familiar with air borne diseases and their preventive measures
CO2. Familiar with food and water borne diseases and their preventive measures
CO3. Familiar with insect borne diseases and their preventive measures
CO4. Familiar with sexually transmitted diseases and their preventive measures
CO5. Familiar with viral diseases and their preventive measures

Text books

1. Mani. A. Narayanan, L.M. Selvaraj A.M. and Arumugam, N. 1996. Microbiology. Saras Publications.

Reference Books:

1. M.J. Pelezar and R.D. Reid. 1993. Microbiology, McGraw Hill Pub.

2. Larry McKane and Judy Kandel. 2000. Microbiology. McGraw Hill Pub.
3. R.C. Dubey and D.K. Maheswari. 2005. A text book of Microbiology, S.Chand & Co. Ltd. New Delhi.
4. Mani. A. Narayanan, L.M. Selvaraj A.M. and Arumugam, N. 1996. Microbiology. Saras Publications.
5. Ananthanarayanan, R. & C.K. Jayaram Panicker, 1990. Text Book of Microbiology. Orient Longman.
6. Sharma, P.D. 1998. Microbiology, Rastoji Publications.
7. Roger Webber. 2016. Communicable Diseases – A Global perspective. Fifth ed. CABI (www.cabi.org).

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**		
Semester	**V**		
Course & Code	**Core course – (CC7)**	**Code: U19ZY7**	
Course Title	**DEVELOPMENTAL BIOLOGY**		
Hours: 5	Credits : 5	Max Marks : 75	

Course Educational Objectives

CEO1.To understand the structure and function of sperm and egg, and fertilization
CEO2. To understand Cleavage
CEO3. To understand Gastrulation
CEO2. To understand the Foetal membranes
CEO3. To understand the reproductive cycles and basics of biotechnology

UNIT – I

Spermatozoon: Spermatogenesis, shape and structure in different chordates. Egg: Oogenesis, egg membranes, patterns of eggs, organization of egg.
Fertilization: External and internal fertilization. Physical, Chemical and cytological perspectives.
Parthenogenesis: natural and artificial

UNIT – II

Cleavage: Salient features, Morula, Blastula (Types; Coeloblastula, Discoblastula, Blastocyst).
Cleavage: Cleavage laws, Planes of cleavage (Meridional, vertical, equatorial, Latitudinal), Patterns of cleavage: Holoblastic (Bilateral, Radial, Spiral), Meroblastic (Superficial).
Factors affecting cleavage, Molecular changes during cleavage.

UNIT – III

Gastrulation: Salient features, Metaboloic and molecular changes during gastrulation, Exogastrulation.
Fate maps: construction of fate map (artificial markings, natural markings)
Morphogenic movements: Types, mechanism of morphogenetic movements
Organogenesis: Development of brain in frog, Development of eye in frog,

UNIT – IV

Development of extraembryonic membranes in chick:chorion, Amnion, Yolk sac, Allantois, serosa amniotic fluid, umbilical cord
Development of foetal membranes in mammals:chorion, Amnion, Yolk sac, Allantois, serosa amniotic fluid, umbilical cord
Placenta: characters, classification (Yolk sac, Chorio-allantoic, Diffuse, cotyledonary, intermediate, zonary, discoidal, metadiscoidal, indeciduate, deciduate, epitheliochorial, syndesmochorrrial, endotheliochorial, haemochorial, haemoendothelial)
Development of placenta

UNIT – V

Reproductive cycles: oestous cycle, Puberty, spermiation, ovulation, menstrual cycle, pregnancy, parturition
Infertility: Types, causes, artificial insemination
Test Tube Baby

Neoteny, Metamorphosis in Amphibians
Stem cells: Definition, Unique properties, Proliferation and Differentiation, Types: Totipotent, Pluripotent, Multipotent and Unipotent. Functions of stem cells.

Course Outcomes

CO1. Familiar with the structure and function of sperm, egg, and reproduction
CO2. Familiar with cleavage in embryology
CO3. Familiar with Gastrulation
CO4. Familiar with Foetal membranes
CO5. Familiar with reproductive cycles and basics of biotechnology

Text book

1. Arumugam, N. 2005. A Text Book of Embryology, Saras Publications, Nagarcoil.
2. Berry. A.K. 2007. An introduction to Embryology. Emkay publications, New Delhi.
3. Subramaniam T. 2002. Developmental Biology. Alpha Science International.

Reference books:

1. Balinsky, B.I. 1981. An introduction to Embryology. W.B. Saunders company.
2. Subramaniam T. 2011. Molecular Developmental Biology. Alpha Science International.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2016 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**		
Semester	**V**		
Course & Code	**Core course – (CC8)**	**Code: U19ZY8**	
Course Title	**MICROBIOLOGY AND IMMUNOLOGY**		
Hours: 5	Credits : 5	Max Marks : 75	

Course Educational Objectives

CEO1. To understand the scope and basics of microbiology
CEO2. To understand the food, industrial, soil and medical microbiology
CEO3. To understand the scope and basics of immunology
CEO4. To understand antigen and antibody
CEO5. To understand immune response

UNIT – I

Introduction: History and scope of microbiology, Classification of Bacteria and Viruses, General structure of microbes (Bacteria and Viruses), Bacterial Culture techniques (Agar Plate and Broth cultures).

UNIT – II

Food microbiology: Food poisoning, Food spoilage, Food preservation.
Industrial microbiology: Production of antibiotics (penicillin).
Soil microbiology: Role of soil microbes in Nitrogen fixation.
Medical microbiology: Diseases caused by Bacteria - Cholera, Tuberculosis. Diseases caused by viruses – AIDS, Polio.

UNIT – III

Scope of Immunology – Immunity: Innate and Acquired, Humoral and Cell mediated.
Lymphoid Organs: Structure and functions of Primary Lymphoid Organs (Thymus, Bone marrow, Bursa) and Secondary lymphoid organs (Lymph node, Spleen, Tonsil, Payer's patches).

UNIT – IV

Antigens: Structure, Types, Properties, Adjuvant.
Antibodies: Structure of Immunoglobulin, types of Immunoglobulin, functions of Immunoglobulin, biological properties.

UNIT – V

Immune response: factors causing immune response, mechanism of immune response, types.
Humoral immune response: mechanisms, types.
Cell mediated immune response: Mechanism
Comparison of humoral immunity and cell mediated immunity

Course Outcomes

CO1. Familiar with the Microbes
CO2. Familiar with food, industrial, soil and medical microbiology
CO3. Familiar with the basics of immunology
CO4. Familiar with antigen and antibody
CO5. Familiar with immune response

Text books

1. Ananthanarayanan, R. and Jayaram Panickar, C.K. 1999. A Text Book of Microbiology. Orient Longman.
2. Mani. A. Narayanan, L.M. Selvaraj A.M. and Arumugam, N. 1996- Microbiology. Saras Publications.
3. Chakravarthy. A.K. 1996. Immunology, Tata McGraw Hill Publishing Co Ltd.

Reference books:

1. Sharma P.D. 1995. Microbiology, Rastogi & Company, Meerut.
2. Berry. A.K. 2005. A text book of Immunology. Emkay publications, New Delhi-
3. Kuby J. 1994. Immunology, W.H. Freeman & Co. New York.
4. Roitt, M.I. 1994. Essential Immunology, Blackwell Science Lyd. Uk
5. Sells, S. 1987. Basic Immunology, Elsiever Science Publishing Co. New York

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**	
Semester	**V**	
Course & Code	**Major Based Elective course – (EC1)**	**Code: U19ZY9E**
Course Title	**ECONOMIC ENTOMOLOGY**	

Hours: 5	Credits : 4	Max Marks : 75

Course Educational Objectives

CEO1.To understand the classification of Insects
CEO2.To understand the destructive insects
CEO3.To understand the beneficial insects
CEO4.To understand household pests
CEO5.To understand insect pest management

UNIT – I

Classification of Insects up to order: Basis of classification – Classification of important pests up to order level (any five), Key characteristics with South Indian Examples. External anatomy of a typical Insect – Exoskeleton, Head, Thorax and Abdomen. Mouth parts of Insects.

UNIT – II

Destructive insects:
Insect Pest of Crops and their control measures: Paddy (*Leptocorisa varicornis, Triporeya incertulas),* Coconut *(Oryctes rhinoceros, Rhynchophorus*), Cotton *(Earias fabia. Platyendra gossypiellas*), Sugarcane (*Phyrilla persusilla, Emmalocera depressella*).

UNIT – III

Beneficial Insects: productive and helpful
Economic importance of Honeybee, Silkworm and Lac-insect.
Insects as pollinators, predators, parasites, weed killers, soil builders and scavengers.
Commercial products of insects: honey, bee-wax, silk, lac, galls, cochineal dye, cantheridine, insect-food, medicines

UNIT – IV

Household insect pests: Mosquito, Cockroach, Housefly, Termites, damages caused and their control measures.

UNIT – V

Insect Pest Management: Conventional Methods: Prophylactic – Curative – Cultural.
Mechanical – Physical – legal & Biological method. Non conventional methods: Plant

products – Chemosterilants – Antifeedants – Pheromones – Insect repellants – Attractants. Integrated pest management (IPM).

Course Outcomes

CO1. Familiar with the world of insects
CO2. Familiar with the destructive insects
CO3. Familiar with the beneficial insects
CO4. Familiar with the household pests
CO5. Familiar with insect pest management

Text books

1. Vasantharaj David, B., Murali Rangan. M.C. and Meera Murali Rangan 1992. Harmful and Insects, Popular Book Depot,Chennai.
2. Vasantharaj David, B. 2001. Elements of economic Entomology, Popular Book Depot, Chennai. 4. D.B Tembhare, Modern Entomology, Himalaya Publishing House

References:

1. Chapman R.F., 1993. The Insects Structure and Functions. ELBS London.
2. Chandler A.C. and Read C.P. 1961. Introduction to Parasitology. John Wiley and Sons, New York.
3. David, B.V. and Muralirangam, N.C. and Meera Muralirangam.1992. Harmful and beneficial Insects. Popular Book Depot.
4. David, B.V 1992. Pest Management and Pesticides. Indian Scenario, Namrutha Publications.
5. Krishnan. N.T. 1993. Economic Entomology. JJ Publications, Madurai.
6. Richards, O.W. and Davies, R. G., 1984. A General Text Book of Entomology Vol. I & II, 10th Edition, Chapman Hall, Lane London.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**	
Semester	**V**	
Course & Code	**Major Based Elective Course –(EC2)**	**Code: U19ZY10E**
Course Title	**AQUACULTURE**	
Hours: 5	Credits : 4	Max Marks: 75

Course Educational Objectives

CEO1. To understand the scope of aquaculture
CEO2. To understand Fish culture
CEO3. To understand ornamental fish culture
CEO4. To understand edible oyster culture
CEO5. To understand marine prawn culture

UNIT – I

Scope of Aquaculture in India.
Water quality parameters: Physical factors (Visibility, Temperature); Chemical factors (O_2, CO_2, Salinity, pH, Biological Oxygen Demand, Nutrients; Biological factors (Plankton, Aquatic weed).

UNIT – II

Fish culture : Cultivable species of fishes (Indian major Carps - *Catla catla* , *Labeo rohita* (Rohu), *Channa punctatus*), Methods of fish farming (Fish farm design, Selection of site, Weed control, Stocking, and Feeding), Fish feed (Live and Artificial). Fish diseases (Bacterial-Columnaris, Bacterial kidney Disease and Viral-Lymphocystis, spring viremia) and control methods, Economic importance of fishes.

UNIT – III

Ornamental fresh water fish culture: Aquarium design, Maintenance of aquarium, Common cultivable species: Goldfish (*Carssius auratus*), Fighter fish (*Betta splendens*), Guppy (*Poecilia reticulata*). Commercial importance.

UNIT – IV

Edible oyster culture: Biology of edible oyster (*Crossostrea madrasensis*), Needs for oyster culture, Essential condition for oyster culture, Farming operation, Economic importance.
Pearl culture: Types of pearls, pearl producing animals, Mechanism of pearl formation, Freshwater pearl culture.

UNIT – V

Marine prawn culture: Common cultivable species, Seed collection, Culture methods (Extensive, Semi-intensive, Intensive, Pen), Diseases: Bacterial (Luminous), Viral (White spot) Commercial importance.
Role of ICAR, MPEDA, FSI and CMFRI in the growth of Aquaculture in India.

Course Outcomes

CO1.Familiar with the world of aquaculture
CO2.Familiar with fish culture
CO3.Familiar with ornamental fish culture
CO4.Familiar with edible oyster culture
CO5.Familiar with prawn culture

Text Books

1. Arumugam.N. 2008. Aquaculture, Saras Publications.
2. Rath, R,.K. 2000. Freshwater Aquaculture. Scientific Publishers, PO No 91, Jodhpur. India

References

1. Jhingran, AVG, 1991, Fish and Fisheries of India, Hindustan Publishing Co.
2. Baradach, JE, JH Ryther and WO McLarney, 1972, Aquaculture. The farming and Husbandary of Fresh water and Marine Organisms. Wiley Interscience, New York.
3. Shukla, G.S, and Upadhyay V.B., 2000. Economic Zoology, Rastogi Publications Meerut.
4. Kamaleswar Pandey and Shukla, J.P., 2005. Fish and Fisheries, Rastogi Publications.
5. Hobler, E.R., and Noble, G.A., 1982. Parasitology 2nd Edition, Lea & Febieger U.S.A
6. Smit. D.G., 1997. Introduction Animal Parasitology 2nd Edition, Johns Willey Sons New York.
7. Soulsby, E.J.L., 1969. Helminths, Arthropods & Protozoa of Domesticated Animals, ELBS Publication London Ed.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**	
Semester	**V & VI**	
Course & Code	**Core Course – (CC9)**	**Code: U19ZY11P**
Course Title	**MAJOR PRACTICAL – III** (Pertaining to Developmental Biology, and Microbiology and Immunology)	
Hours:6 (3+3)	Credits : 5	Max Marks : 75

Course Educational Objectives

CEO1. To understand the various developmental stages of chick embryo
CEO2. To identify the blood group
CEO3. To understand the lymphoid organs
CEO4. To differentiate bacteria using stains
CEO5. To understand the basic biotechnological methods

Developmental Biology

1. Observation of the structure of spermatozoa of Cattle from a cattle farm/ breeding centre.
2. Observation of prepared micro slides.

Spotters: (a). Egg, cleavage, blastula and yolk plug stages in frog.
(b). Egg, 24, 48, and 72 hrs developmental stages in chicks

Immunology

1. ABO Blood grouping, Rh Type.
2. Vidal Test-Agglutination (Demonstration).
2. Observation of lymphoid organs in rat (Chart, Virtual)
3. Spotters: Immuno electrophoresis (from picture), Lymphoid organs in rat.

Microbiology

1. Fixing and staining of bacteria using simple stain.
2. Bacteria culture (demonstration)
3. Differentiation of bacteria in a smear using gram staining.

3. Spotters: Autoclave, Petri plate, Micropipette, Laminar air flow chamber, Inoculation loop.

A record of lab work should be maintained and submitted at the time of the practical examination.

Course Outcomes

CO1. Familiar with various developmental stages of chick
CO2. Familiar with blood group
CO3. Familiar with lymphoid organs
CO4. Familiar with bacterial differentiation technique
CO5. Familiar with basic biotechnical methods

Text book

Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S. Chand & Co.)

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc. Zoology**	
Semester	**V & VI**	
Course & Code	**Core Course – (CC10)**	**Code: U19ZY12P**
Course Title	**MAJOR PRACTICAL – IV** (Pertaining to Genetics and Evolution, Environmental Biology and management, Biophysics and Biostatistics)	
Hours:6 (3+3)	Credits : 6	Max Marks : 75

Course Educational Objectives

CEO1. To understand the genetic importance by studying different chromosomal aberrations in man

CEO2. Ability to enumerate RBC &WBC and measure pH

CEO3. Ability to Estimate of dissolved oxygen and CO2

CEO4. Ability to understand and identify the fossils

CEO5. Ability to do statistical analysis

Genetics:

1. Simple mendelian traits in man – Sexlinked traits – Inheritance of colour blindness.
2. Drosophila –Identification of Sex, Mutant forms (from pictures), Genetic importance.
3. Human Karyotypes: Normal, Down's, Klinfelter's and Turner's syndromes.

Evolution:

1. Fossils: Trilobite, Nautilus.
2. Mimicry: Leaf insects, Stick insects, Monarch and Viceroy butterfly
3. Colouration: Chameleon, Lycodon.

Environmental Biology:

1. Estimation of Dissolved oxygen.
2. Mounting and Identification of Plankton (Fresh water or marine)
3. Spotters: Animal association (parasitism, mutualism and commensalisms), Inter tidal fauna (rocky, sandy, and deep sea), Secchi disc, Thermometer, Barometer, Luxmeter, Sedgwick Rafter Cell.
4. Food web.

Biodiversity: Field visit

Biophysics:

1. Spotters: Spectrophotometer, pH meter and Electrophoretic unit.

Demonstration of Infrared Spectrometer, Fluorescent spectrometer at NCIF

Biostatistics:

1. Construction of Bar and Pie diagram.
2. Calculation of Mean, Median and Mode, Standard deviation and Standard error.
3. Chi square test.
4. Student t test.
5. Statistical packages – Training in anyone package.

"Industrial-/Forest-/Zoo-visit (Educational Tour) report should be included in the practical record"

A record of lab work should be maintained along with tour report and submitted at the time of the practical examination.

Course Outcomes

CO1. Familiar with chromosomal aberrations in man
CO2. Familiar with RBC and WBC count and pH measurement
CO3. Familiar with the estimation of dissolved oxygen and CO2
CO4. Familiar with fossils
CO5. Familiar with statistical techniques

Reference

Verma and P.C.Srivastava 2007. Advanced Practical in Zoology (S. Chand & Co.)

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., (Other than Zoology Students)**	
Semester	**V**	
Course & Code	**Non Major Elective course – (NME-II)**	**Code: U19NMZY2**
Course Title	**VERMICULTURE & APICULTURE**	
Hours: 2	Credits : 2	Max Marks : 75

Course Educational Objectives

CEO1.To understand the scope and importance of vermiculture
CEO2.To understand the techniques involved in vermiculture
CEO3.To understand the economic, legal and social contexts associated with vermiculture
CEO4.To understand the scope and importance of apiculture
CEO5.To understand the economic, legal and social contexts associated with apiculture

UNIT – I

Vermiculture – definition, scope and importance, common species for culture. Taxonomic position and diversity of earthworms, Life cycle, growth of *Lampito mauritti*, *Perionyx excavatus*. Food preference- Culture practices – Optimal conditions for vermiculture – temperature, pH, soil type, organic matter, protection from sun light, rain and predators.

UNIT – II

Environmental requirements, culture methods – wormery – breeding techniques, indoor and out door cultures – monoculture and polyculture – Outline and ecological classification – Epigeic, Endogeic and Anecic species.

UNIT – III

Applications of vermiculture – vermiculture Biotechnology, vermiculture composting, use of vermicastings and vermiwash in organic farming: horticulture, earthworms for management of municipal waste, selected biomedical solid wastes as feed, bait for capture, culture fisheries, forest regeneration. Medicinal importance.

UNIT IV

Bee keeping down the ages - Present status of Apiculture in India - Species of honey bees. Bee colony, Castes. Natural colonies and their yield. Types of beehives - structure - location, care and management - Genetic studies - breeding of stocks - winterbroods. Bee foraging: Pollen and nectar yielding plants. Honey extraction, seasonal maintenance, swarming and supersedure - pheromone.

UNIT V

Natural enemies and diseases of honey bees and control methods. Bee poisoning and utility of bees in toxicity studies. Economics of Apiculture and Management. Hotiey yield in national and international market. Prospects of apiculture as self employment venture. Preparing proposals (Layout and budget) for financial assistance and funding agencies. Uses of honey and beeswax in Indian medicine.

Students must be exposed to Apiculture units and submit a report along with other practical records.

Course Outcomes

CO1. Familiar with the world of cultivable earthworms
CO2. Familiar with the cultivable earthworms
CO3. Familiar with the economic aspects of earthworms
CO4. Familiar with the world of cultivable bees
CO5. Familiar with the economic aspects of bees

Text books

1. Sultan Ahmed Ismail, 2005. The Earthworm Book. Second Revised Edition. Other India Press, Goa, India.
2. Tripathi, G. Vermiresource Technology, 2003, Discovery Publishing House, New Delhi
3. Shukla, G.S, and Upadhyay V.B., 2000. Economic Zoology, Rastogi Publications Meerut.

Reference books:

1. Mary Violet Christy, A. Vermitechnology, 2008, MJP Publishers.
2. Arvind Kumar, Verms & Vermitechnology, 2005. APH Puiblishing Cooperation.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2016 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**		
Semester	**VI**		
Course & Code	**Core course – (CC11)**	**Code: U19ZY13**	
Course Title	**GENETICS AND EVOLUTION**		
Hours: 6	Credits : 6	Max Marks : 75	

Course Educational Objectives

CEO1. To understand the genetic aspects of chromosomes
CEO2. To understand the mutation and changes in chromosomal numbers
CEO3. To understand the molecular genetics
CEO4. To understand basic concepts of evolution
CEO5. To understand the evolution of man

UNIT – I

Human Chromosome: Karyotype, Barr Bodies, Sex Chromosomal Syndromes – Turner & Klinfelter. Linkage, Crossing-over: Definition and Mechanism, Cytological evidence of Crossing-over, Drosophila as an example. Chromosome map.

UNIT – II

Chromosomal aberrations: Structural changes in Chromosome; Types – Deletion (Deficiency), Duplication, Inversion, Translocation.
Changes in Chromosome number- Euploidy: Monoploidy, Polyploidy – Autopolyploid, Allopolyploid, Synthesized allopolyploid.
Aneuploidy: Monosomy, Nullisomy, Trisomy, Double Trisomy, Tetrasomy.

UNIT – III

Molecular Genetics: Fine structure of Gene, Cistron, Recon and Muton, Gene expression and regulation in Prokaryotes, Operon Model, Lac and Trp Operon, Gene Regulation in Eukaryotes. Britton and Davidson Model. Gene Amplification. Genetic basis of Cancer.

UNIT – IV

Evolutionary Theories: Lamarckism, Neo Lamarckism, Darwinism, Neo Darwinism, Modern Synthetic Theory. Hardy-Weinberg Law.

UNIT – V

Speciation, Isolating mechanisms, Adaptive radiation, Geological Timescale: Paleozoic, Mesozoic and Cenozoic era, Origin and Evolution of Man: *Homo habilis, Homo erectus*, *Homo neanderthalensis, Homo denisova, Homo floresiensis, Homo naledi, Homo sapiens*

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Course Outcomes

CO1. Familiar with genetic aspects of chromosomes
CO2. Familiar with mutation and changes in chromosomal numbers
CO3. Familiar with the molecular genetics
CO4. Familiar with basic concepts of evolution
CO5. Familiar with the evolution of man

Text books

1. Verma, P.S. and Agarval, V.K. 1997. Genetics . S.Chand & Co., New Delhi

2. Arumugam, N. 1989. Organic Evolution. Saras Publication. Nagarcoil

References Books:

1. Lewin, B. 2009. Gene X. Wiley Eastern Ltd., New Delhi.
2. Strickberger, M.W. 2002. Genetics. Printice Hall of Inda, New Delhi.
3. Rothwell, N.V. 1979. Human Genetics. Printice Hall of Inda, New Delhi.
4. Strickberger, M.W. 2000. Evolution. Jones and Barlett Publishers.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**	
Semester	**VI**	
Course & Code	**Core course – (CC12)**	**Code: U19ZY14**
Course Title	**ENVIRONMENTAL BIOLOGY AND MANAGEMENT**	
Hours: 6	Credits : 6	Max Marks : 75

Course Educational Objectives

CEO1. To understand the scope and importance of our environment
CEO2. To understand the components of an ecosystem
CEO3. To understand the concepts of community and population ecology
CEO4. To understand the biogeochemical cycles
CEO3. To understand the global warming

UNIT – I

Environmental Biology: Definition, Scope. Abiotic factors : Water, Soil, Temperature, Light. Biotic factors. Ecosystem: Definition, Structure, Pond ecosystem. Food chain, Food web.

UNIT – II

Trophic levels, Ecological pyramids (Pyramid of numbers, Pyramid of energy, Inverted pyramid), Energy flow.

Animal relationship: Definition, Symbiosis, Commensalism, Mutualism, Antibiosis, Parasitism, Predation and Competition.

UNIT – III

Population Ecology: Definition, Density, Natality & Mortality, Age distribution, Age pyramids, Population growth.

Community Ecology: Definition, Characteristics (Community independence, Community concepts, Ecotone & Edge effect, Ecological nich, Ecological succession).

UNIT – IV

Biogeochemical cycles: Oxygen, Nitrogen and Phosphorus

Pollution and Management: Types, Sources, Effects (Air, Water, Land, Noice)

UNIT – V

Global warming:

Highlights of UN Conferences & Protocols On Environment, Sustainable Development, Climate Change: 1. UN Conference on Human Environment, Stockholm (1972), 2. Vienna Convention (1985), Montreal Protocol (1989), 3. Basal Convention (1989), 4. Geneva Convention (1990), 5. UN Convention on Climate Change, New York (1992), 6. Economic Development and Environmental Protection Bio-diversity Convention, Nairobi (1992), 7. UN Conference on Environment and Development (Earth Summit) Rio de Janeiro, Brazil (1992), 8. Kyoto Protocol (1997), 9. World Summit on Sustainable Development, Johannesburg (2002), 10. Copenhagen Summit (2009), 11. Bali, Indonesia (2007) 12. United Nations Climate Change Conference, Doha, Qatar (2012), 13. Paris Agreement (2016)

Course Outcomes

CO1. Familiar with our environment
CO2. Familiar with various components of ecosystem

CO3. Familiar with various concepts of community and population ecology
CO4. Familiar with biogeochemical cycles
CO5. Familiar with global warming

Text books

1. Odum, E.P., 1971. Fundamentals of Ecology. W.B. Saunders Company, Philadelphia.
2. Krishnamurthy, K.V. 2003. Introduction to Biodiversity. Oxford and IBH.
3. Bhatia, A.L. 2010. A Textbook of Environmental Biology. I.K. International Publishing House.

Reference Books:

1. Clarke, G.L. 1954. Elements of Ecology, John Wiley & Sons. N.Y.
2. Kendeigh, S.C., 1961. Animal Ecology. Prentice Hall.
3. Rastogi, V.B. and M.S, Jayaraj,1989. Animal Ecology and Distribution of Animals.
4. Verma, P.S. and V.K. Agarwal, 1996. Principles of Ecology. S. Chand & Co New Delhi.
5. Bharucha Erach. The Biodiversity of India. Mapin Publishing Pvt.. Ltd., Ahmedabad.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**		
Semester	**VI**		
Course & Code	**Core course – (CC13)**	**Code: U19ZY15**	
Course Title	**BIOPHYSICS AND BIOSTATISTICS**		
Hours: 6	Credits : 6	Max Marks : 75	

Course Educational Objectives

CEO1. To understand the colloids
CEO2. To understand the laws o f thermodynamics
CEO3. To understand the principles involved in chromatography, electrophoresis, and spectrophotometer
CEO4. To understand biological method of data collecetion
CEO5. To understand basic statistical tests

UNIT – I

X-ray diffraction – Polymerization of organic molecules – Colloids - description, and properties. Thermodynamic principles – Membrane biophysics – diffusion, active transport. Tyndall effect, Surface tension, Brownian movement, filtration, osmosis, dialysis.

UNIT – II

Components of Light: Beer and Lambert's law of light absorption.

Laws of thermodynamics.

Photoelectric effect – Photodynamic sensitization – Effect of UV light and ionizing radiations – Detection – Disintegration – Measurement of radio activity – Gieger Muller counter – Isotopes as tracers - Free energy from electromagnetic waves - Natural radiations.

UNIT – III

Principles and application of chromatography – Paper – Thin layer – Column – Ion – exchange – filtration – Gas liquid – HPLC and Affinity.

Principles and applications of electrophoresis – Agarose gel electrophoresis – PAGE – SDS-PAGE.

Principles and applications of electrophoresis Spectrophotometer,

UNIT – IV

Data: Measurement of data, Primary and Secondary data

Hypothesis: Null and Alternative, Type I error, Type II error

Types of variables: Continuous and discontinuous variables, Qualitative and quantitative variables.

Presentation of data: Tabulation of data, Histogram, Polygon, Pie diagram.

UNIT – V

Definition, illustration and significance: Mean, Median, Mode, Standard deviation,

Standard Error, Variance and Co Variance.

Definition, illustration and significance: Chi square, t-test, Simple Correlation and regression.

Course Outcomes

CO1. Familiar with colloids
CO2. Familiar with the laws of thermodynamics
CO3. Familiar with the principles involved in chromatography, electrophoresis, and spectrophotometer
CO4. Familiar with the method of biological data collection and analyses.
CO5. Familiar with basic statistical tests

Text books

1. Das, D. 1996. Biophysics and Biological Chemistry. Academic Publishers, Calcutta.
2. Snedecor, G.W. and W.G. Cochan 1967. Statistical methods, Oxford & IBH Publishing. New Delhi.

Reference Books:

1. Daniel, M. 1992 – Basic Biophysics and Biologists. Wiley International, New Delhi.
2. Zar, J.H. 1974. Bio statistical analysis. Prentice Hall Inc., New Jersey, USA.

For Candidates to be admitted from the academic year **2019** onwards

SYLLABUS

(For Candidates to be admitted from 2019 June Onwards)

PG & RESEARCH DEPARTMENT OF ZOOLOGY, NATIONAL COLLEGE (AUTONOMOUS)

CLASS	**III – B.Sc., Zoology**	
Semester	**VI**	
Course & Code	**Major based Elective course – (EC3)**	**Code: U19ZY16E**
Course Title	**WILDLIFE BIOLOGY AND NANOBIOLOGY**	
Hours: 5	Credits : 4	Max Marks : 75

Course Educational Objectives

CEO1. To understand the values and importance of wildlife
CEO2. To understand the conservation priorities
CEO3. To understand various ongoing conservation projects in India
CEO4. To understand the basic concepts of nanobiology
CEO5. To understand applications of nanobiology

UNIT – I

Wildlife concept: Importance of Wild life conservation:-ecological, ethical, educational, scientific, commercial, aesthetic, and recreational. Conservation methods:- In situ conservation-sanctuaries, national parks, biosphere reserves, Ex situ conservation-captive breeding, modern zoo, safari, nocturnal zoo.

UNIT – II

Conservation priorities: IUCN classification - extinct, critically endangered, endangered, vulnerable, conservation dependent, low risk, data deficient, not evaluated.
Concepts: Flagship species, Umbrella species, Hotspots, Endemic Species, Important Bird Areas.
Protected areas of Tamil Nadu: Sanctuaries, National Parks, Tiger Reserves.

UNIT – III

Conservation project: A. Tiger project- Tiger biology, distribution, threats, conservation action taken, B. Elephant project: Elephants biology, distribution, threats, conservation action taken. C. Crocodile Project-crocodile biology, species, distribution, threats, conservation action taken. D. UNDP Sea Turtle Project- biology, species, distribution, threats, conservation action taken.

UNIT – IV

Origins of concepts of Nano, Basic and Basis: size of Nano, The meaning of Nanotechnology, Four Generations of Nanotechnology Development, Technology of General Applicability, Multi-purpose Technology, Exponential Proliferation. Applications of Nanotechnology in biological filed

UNIT – V

Nanobiology:
Basic concepts and applications: drug delivery, cancer diagnosis and therapy, surgery, In vivo therapy, Neuro-electronic Interfaces, cell Repair Machines.

Biosenors: definition, principles of detection, optical biosensor, electrochemical biosensor, nanobiosensor, DNA sensors, Quantum dots.

Course Outcomes

CO1. Familiar with the importance of wildlife
CO2. Familiar with the conservation priorities
CO3. Familiar with the conservation projects
CO4. Familiar with the basic concepts of nanobiology
CO5. Familiar with the applications of nanobiology

Text books

1. Sutherland W.J.2000.The conservation hand book: research, management and policy Blackwell Science Ltd.
2. Varadharajan Gokula 2013. Elementary Wildlife Biology, Lap Lambert Academic Publishing OmniScriptum GmbH & Co. KG. Germany. ISBN : 978-3-659-50085-5: 292 pp

References

1. Martin and Bateson, 2007. Measuring Behaviour. Cambridge University Press.
2. Andrawartha, H.C. and L.C. Birch. 1974. The distribution and abundance of animals. The University of Chicago Press, London.
3. Agarwal, V.P. 1980. Forests in India. Oxford and IBH Publishing Co. New Delhi.
4. Davis, M. 1981, Infectious diseases of wild mammals. The IOWA state.
5. Giles, R.H. 1984. Wild life management techniques. The wild life society, Washington and Natraj Publishers, Dehra Dun.
6. Saharia, V.B. 1982. Wild life in India. Nataraj Publishers, Dehra Dun.
7. Foster, L.E. 2006. Medical Nanotechnology: science, innovation and Opportunity. Pearson Education. Upper Saddle River.
8. Ratner, M. and Ratner, D. 2002. Nanotechnology: A gentle introduction to the Next Big Idea. Pearson Education. Upper Saddle River.
9. Shanmugam.S. 2010. Nanotechnology. MJP Publishers. 274pp.

For Candidates to be admitted from the academic year **2019** onwards

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.

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SEMESTER – II **COURSE CODE: U19SBE1**

HOURS: 2 **CREDITS: 2**

OFFICE AUTOMATION

UNIT I:

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

UNIT II:

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

UNIT III:

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

UNIT IV:

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

UNIT V:

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

TEXTBOOKS

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

SEMESTER – III **COURSE CODE: U19SBE2**

HOURS: 2 **CREDITS: 2**

DESKTOP PUBLISHING

UNIT I:

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

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

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

UNIT II:

File: Save, File formats, Page set up.

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

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

Window: Character and Paragraph settings.

COREL DRAW:

UNIT III:

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

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

UNIT IV:

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

Shaping Options: Weld, trim, Intersect.

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

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

PAGE MAKER:

UNIT V:

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

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

File: Page set up, save, Save as.

TEXTBOOKS

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

SEMESTER – III **COURSE CODE: U19SBE3P**

HOURS: 2 **CREDITS: 2**

OFFICE AUTOMATION & DESKTOP PUBLISHING LAB

UNIT I:

Office Automation

1. MS – Word: Text Formatting, Mail Merge
2. Ms – Excel: Implement the Statistical & Mathematical Function

   (Using Min ,Max, Median, Average, Standard Deviation, Correlation, Logical 'if' Condition) for the given data.

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

UNIT II:

Photoshop

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

UNIT III:

Corel Draw

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

UNIT IV:

Page Maker

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

PART – IV: VALUE EDUCATION - U19VE

HOURS: 2 **CREDITS: 2**

Learning Objectives

This subject deals with the

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

UNIT I:

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

UNIT II:

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

UNIT III:

SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE) Family (Kural 45), Peace in Family (Kural 1025), Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) , The Pride of Womanhood (Kural 56) Five responsibilities/duties of Man : a) to himself, b) to his family, c) to his environment, d) to his society, e) to the Universe in his lives (Kural 43, 981), Thriftness (Thrift)/Economics (Kural 754), Health (Kural 298), Education (Kural 400), Governance (Kural 691), People's responsibility/ duties of the community (Kural 37), World peace (Kural 572)

UNIT IV:

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

UNIT V:

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

LEARNING OUTCOMES:

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

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

TEXTBOOKS

1. Philosophy of Universal Magnetism (Bio-magnetism, Universal Magnetism) The World Community Service Centre Vethatri Publications (for Unit IV)

2. Pope, G.U., Dr. Rev., Thirukkural with English Translation, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613004 (for All Units)

3. Value Education for Health, Happiness and Harmony, The World Community Service Centre Vethatri Publications (for All Units)

PART – IV: SOFT SKILLS - U19SS

HOURS: 2 **CREDITS: 2**

Learning Objectives

This subject deals with knowledge of understanding

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

LEARNING OUTCOMES:

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

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

UNIT I:

Know Thyself / Understanding Self Introduction to soft skills self discovery – Developing positive attitude – Improving perceptions – Forming values.

UNIT II:

Interpersonal Skills/ Understanding Others Developing interpersonal relationship –Team building – group dynamics –Net working- Improved work relationship

UNIT III:

Communication Skills/ Communication with others Art of Listening –Art of reading –Art of speaking – Art of writing –Art of writing emails-e mail etiquette

UNIT IV:

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

UNIT V:

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

TEXT BOOKS

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

REFERENCE BOOKS

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

Principle centred leadership Stephen Covey

SEMESTER – VI **COURSE CODE: U19GS**

PART – V: GENDER STUDIES

HOURS: 1 **CREDITS: 1**

Learning Objectives

This subject deals with

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

LEARNING OUTCOMES:

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

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

UNIT I:

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

UNIT II:

Women's Studies Vs Gender Studies: UGC's Guidelines - VII to Xl 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 - Polities Law Domestic Violence — Sexual Harassment — State Policies and Planning

UNIT IV:

Women Development and Gender Empowerment: Initiatives International Women's Dcca4e - 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 ofSexual 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.