

BAGALKOT UNIVERSITY

Mudhol Road, Jamkhandi-587301 Dist: Bagalkot

The Draft

PROGRAM /COURSE STRUCTURE AND SYLLABUS As per the Choice Based Credit System (CBCS) designed in accordance with Learning Outcomes-Based Curriculum Framework (LOCF) of National Education Policy

(NEP) 2020

for

Bachelor of Science / Bachelor of Science (Hons)

As per NEP 2020 and adapted from RCU Belagavi applicable from the Academic Year 2023-24

Preamble for UG Syllabus of Bagalkot University

Bagalkot University Jamkhandi has been established by the Government of Karnataka and has started functioning from the academic year 2023-24. All the degree colleges other than engineering and medical colleges in the district of Bagalkote, are affiliated to this university as per the Karnataka State Universities Act 2000, as modified by the 26th Act of 2022. The students taking admission to any of the colleges in the district of Bagalkote, from the academic year 2023-24 will be students of Bagalkot University. The Chancellor of the university, the honorable Governor of Karnataka, has instructed the Vice chancellor and the university to adapt, the rules and regulations of the parent university, Rani Channamma University, Belagavi for the immediate activities (Letter from the office of the Governor GS 01 BGU 2023 dated 17/05/2023).

In this connection, Bagalkot University has adapted the undergraduate syllabus from RCU, Belagavi for all the 3/4 year degree programmes such as BA, BSC, BCOM, BCA, BSW etc. The syllabus follows the NEP 2020 format and the first year syllabus is being published. The higher semester syllabi will be published in due course. The syllabus is being published as one electronic file for each degree and is self contained. Only the subject codes/ question paper codes are changed. The subject code format is described in the following.

Subject	Code	Format	-
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ver	Uni. C	Code	DEGI	REE		SEM		DISCIPLINE		E SUB. TYPE				SL. NO. IN DISC. & S. TYPE		TH/ LAB /B/I NT.
1	2	6	В	S	C	0	1	Р	Н	Y	D	S	С	0	1	Т
1	2	6	В	A	В	0	1	Н	Ι	S	D	S	С	0	1	Т

[1] The Ver information gives the version of the syllabus. It can take values 1,2..9,a,b,...

[2-3] The University UUCMS Code

[4-6]The UG degree codes to be provided as

Sl. No	Degree Code	Degree
1	BSC	Bachelor of Science
2	BAB	Bachelor of Arts
3	BCM	Bachelor of Commerce
4	BBA	Bachelor of Business Administration
5	BCA	Bachelor of Computer Applications
6	BSW	Bachelor of Social Work

[7-8]The Semester Information is provided as

Sl. No	Semester
1	ʻ01
2	'02
3	03

[9-11]The Discipline Information to be provided as

Sl No	Degree	Discipline Code
1	BCM-BCOM	XXX
2	BCA	XXX
3	BBA	XXX
4	BSW	XXX
5	BA	'HIS',GEO','KAN', 'HIN' etc. The detailed list is to be provided
6	BSC	'PHY', 'CHE', 'BOT', 'ELN' etc. The detailed List is to be Provided

[12-14]The Subject Type to be provided as

Sl. No.	ТҮРЕ	Description
1	DSC	Discipline Specific Core
2	DSE	Discipline Specific Elective
3	OEC	Open Elective Course
4	AEC	Ability Enhancement Course
5		

[15-16]The Running Serial Number is to be provided for a particular discipline and subject type 01 to 99

[17] This character specifies the category of the subject namely, T=theory, L-Lab, P-Project, I-Internship, B- Bothe theory and Lab

> Syllabus & Regulations Governing the Choice-Based Credit System (CBCS) for the Three year (Six Semester)/ Four-Year (Eight Semesters) B.Sc (Hons) Program

Introduction to BSc/B.Sc. (Hons)

The Choice Based Credit System (CBCS) provides an opportunity to a student to choose courses from the syllabus comprising Core, Elective, Vocational and Skill based courses. It offers a flexibility of programme structure while ensuring that the student gets a strong foundation in the subject and gains in-depth knowledge. The learning outcome based curriculum framework (LOCF) will provide students with a clear purpose to focus their learning efforts and enable them to make a well judged choice regarding the course they wish to study. This will suit the present day needs of students in terms of securing their paths towards higher studies or employment.

Programme Structure

Discipline Specific Core (DSC) Courses: First, second, third and fourth semesters will have one DSC course in each semester. Every DSC course has 6 credits and a practical component (4 credits for theory and 2 credits for practical).

Fifth and sixth semesters will have two Discipline Specific Core (DSC) courses in each semester. Every DSC course has 5 credits and has practical component (3 credits for theory and 2 credits for practical).

Seventh and eighth semesters will have three Discipline Specific Core (DSC) courses in each semester, three DSC courses have 6 credits each (4 credits for theory and 2 credits for practical).

Open Elective (OE) Courses: First, second, third and fourth semesters will have one OE course in each semester. Every OE course has 3 credits and with no practical component. OE courses are for other subject students (other than major and minor), and the candidate has to choose one OE from the each semester.

Vocational Courses: Fifth and sixth semester will have one each vocational courses of each 3 credits. In sixth semester students have 2 credits internship course (usually on research related work (basic knowledge about research, how to start, literature, journals, reviews and more can be taught and ask students to do and submit a final report for assessment). These courses can enable students to obtain the required basic research insights knowledge along with online resource or practical skills.

Discipline Specific Elective (DSE) Courses: Seventh and eighth semesters will have two DSE courses. In seventh semester will have one research methodology (3 credits) and another subject to meet the equivalence of first year master degree (4 credits). In eighth semester againone DSE 4 credits theory and another research project for 4 credits need to perform one semester project work by selecting suitable problems by the mentors.

Programme Outcomes of BSc/B.Sc. (Hons)

The BSc/B.Sc. (Hons) programme is designed to develop in depth knowledge in students, of the core concepts and principles that are central to the understanding of this core science discipline. Undergraduates pursuing this programme of study go through laboratory work that specifically develop their quantitative and qualitative skills, provides opportunities for critical thinking and team work, and exposes them to techniques useful for applied areas of scientific study.

> Knowledge: Width and depth:

Students acquire theoretical knowledge and understanding of the fundamental concepts, principles. In depth understanding is the outcome of transactional effectiveness and treatment of specialized course contents. Width results from the choice of electives that students are offered.

Laboratory Skills: Quantitative, analytical and instrument based: A much valued learning outcome of this programme is the laboratory skills that students develop during the course. Quantitative techniques gained through hands on methods opens choice of joining the industrial laboratory work force early on. The programme also provides ample training in handling basic laboratory instruments and their use in analytical determinations. Undergraduates on completion of this programme can cross branches to join analytical, pharmaceutical, material testing and standard laboratories.

> Communication:

Communication is a highly desirable attribute to possess. Opportunities to enhance students' ability to write methodical, logical and precise reports are inherent to the

structure of the programme. Techniques that effectively communicate scientific content to large audiences are acquired through oral and poster presentations and regular laboratory report writing.

Capacity Enhancement:

Modern day scientific environment requires students to possess ability to think independently as well as be able to work productively in groups. This requires some degree of balancing. The B.Sc / B.Sc. honors programme course is designed to take care of this important aspect of student development through effective teaching learning process.

> Portable Skills:

Besides communication skills, the programme develops a range of portable or transferableskills in students that they can carry with them to their new work environment after completion of B.Sc./B.Sc. honours programme. These are problem solving, numeracy and mathematical skills- error analysis, units and conversions, information retrieval skills, IT skills and organizational skills. These are valued across work environments.

Program Specific Outcomes

- Students are prepared to create, select and apply appropriate techniques to solve highly complex problems using available resources in modern science and technology era in the multidisciplinary environment.
- Specialized knowledge and practical training which enables to address contemporary problems in academia and industry.
- It also encourage students to fix their feet and bright their carrier in the fields of science and technology for sustainable future and solve the emerging opportunities and challenges.
- Students are motivated to understand theoretical and practical applications in which traditional and modern apparatus are used.
- Awareness will be created to understand the various critical perspectives and environmental challenges in science.

Structure of the Programme in B.Sc. / B.Sc (Hons.)

The programme includes Core Courses and Elective Courses. The Core Courses are all compulsory courses (DSC). There are three types of Elective Courses – Discipline Specific Elective (DSE), Open Elective (OE), and Skill Enhancement Courses (SEC), have sub skill based and value based. In addition there are two compulsory Ability Enhancement Courses (AECC). The Core, DSE and GE Courses are six credit courses; the SEC, AEC are four credit courses.

B.Sc. Programme structure having practical core courses

(One major and other minor, both are practical core courses)

	Discipline Specific Core Courses(DSCC)			cific Core Elective Courses urses(DSCC) Discipline Specific Elective(DSE) /			Ability Enhancement Course									
								Skill	Enhanc	cement Co		Enh	Ability ancement	t	otal	
				Open Elective Course(OEC)			Skill Based			Value Based			Compulsory Course (AECC)			Credi
	Core Course	L+T+P	Credit	Cours e	L+T+P	Credit	Course	L+T+P	Credit	Course	L+T+P	Credit	Course	Instr uctio n Hrs	Credit	ts
	DSCC- A 1	4+0+4	4+2=6	0.7.6.4	3+0+0	3+0=3	SEC-1	1+0+2	1+1=2	Health and	0+0+2	0+1=1	Kannada-1	4	3+0=3	
I	DSCC-B1	4+0+4	4+2=6	OEC-1						Wellness + Yoga	+ 0+0+ 2	+ 0+1= 1	MIL/MEL-1	4	3+0=3	25
	DSCC-A2	4+0+4	4+2=6							NCC/NSS/			Kannada-2	4	3+0=3	
п				OFC-2	3-0-0	3-0-3				R	0+0+2	0+1=1	MIL/MEL-2	4	3+0=3	25
	DSCC-B24	4+0+4	4 4+2=6	OLC-2	3+0+0	5-0-5				&R(S&G) / Cultural + Yoga	0+0+ 2	0+1= 1	Environment alstudy	2	2+0=2	23
	Exit option with Certificate (50 credits)															

Note:

- In case of B.Sc. Once a candidate chose two courses/subjects of a particular two department in the beginning, he/she shall continue the same till the end of the degree, then there is no provision to change the course(s) and Department(s).
- A candidate shall choose one of the Department's courses as major and other Department course as minor in fifth and sixth semester and major course will get continued in higher semester.
- OEC: Students should opt OEC from departments other than major and minor disciplines.

Note, Abbreviation Explanation and Coding:

Concept Note:

- 1. **CBCS** is a mode of learning in higher education which facilitates a student to have some freedom in selecting his/her own choices, across various disciplines for completing a UG/PG program.
- 2. A credit is a unit of study of a fixed duration. For the purpose of computation of workload as per UGC norms the following is mechanism be adopted in the University:

One credit (01) = One Theory Lecture (L) period of one (1) hour. One credit (01) = One Tutorial (T) period of one (1) hour. One credit

(01) = One practical (P) period of two (2) hours.

- 3. Course: paper/subject associated with AECC, DSC, DSEC, SEC, VBC, OEC, VC, IC and MIL
- **4.** In case of **B.Sc. Once a candidate chose two courses/subjects of a particular two department in the beginning, he/she shall continue the same till the end of the degree/Hons, then there is no provision to change the course(s) and Department(s) in between.**
- 5. A candidate shall choose one of the Department's courses as major and other Department course as minor in fifth and sixth semester and major course will get continued in higher semester.
- 6. Wherever there is a practical there will be no tutorial and vice-versa
- 7. A major subject is the subject that's the main focus of Core degree/concerned.
- 8. A minor is a secondary choice of subject that complements core major/ concerned.
- 9. Vocational course is a course that enables individual to acquire

skills set that are required for a particular job.

- 10. Internship is a designated activity that carries some credits involving more than **25 days** of working in an organization (either in same organization or outside) under the guidance of an identified mentor. Internship shall be an integral part of the curriculum.
- 11. OEC: Should be other than DSC and DSEC subjects. For example Chemistry students have to opt for OEC from departments other than major and minor disciplines.

Abbreviation Explanations:

- 1. AECC: Ability Enhancement Compulsory Course.
- 2. DSC: Discipline Specific Core Course.
- 3. DSEC: Discipline Specific Elective Course.
- 4. SEC: Skill Enhancement Course.
- 5. VBC: Value Based Course.
- 6. OEC: Open/Generic Elective Course
- 7. VC: Vocational Course.
- 8. IC: Internship Course
- 9. L1: Language One

10. L2: MIL

11. L3 : Language three

12. L4 : MIL

13. L= Lab; T= Theory; P=Project.

14. MIL= Modern Indian Language; English or Hindi or Telugu or Sanskrit or Urdu

Credits Structure of B.Sc. I Semester

SEMESTER-I										
Catego	Course code	Title of		Mark	28	Teaching hours/wee k			Credi	Duratio n of
Ty		the Paper	I A	SE E	Tota 1	L	Т	Р	l	(Hrs)
T 1	126BSC01LANAE C01T	Kannada	4	60	100	4			2	2
LI	126BSC01LANAE C02T	Functional Kannada	0	00	100	4	-	-	5	2
	126BSC01LANAE C03T	English								
	126COM01LANAE C04T	Hindi			100		_		3	
L2	126COM01LANAE C05T	Sanskrit		60		1				2
	126COM01LACAE C06T	Marathi	0			4	-	-		2
	126COM01LANAE C07T	Urdu								
	126COM01LANAE C08T	Arabic								
DSC1	126BSC01XXXDS C01T	XXX	4 0	60	100	4	-	-	4	2
	126BSC01XXXDS C02L	XXX	2 5	25	50	-	-	4	2	4
	126BSC01XXXDSC 0		4 0	60	100	4		-	4	2
DSC1	1T 126BSC01XXXDS C02L	XXX XXX	2 5	25	50	-	-	4	2	4
SEC1	126COM01XXXSE C01T	Digital Fluency	25	25	50	1	-	2	2	2
VBC1	126COM01XXXV BC01B	Yoga/ Sports	25		25	-	-	2	1	
VBC2	126COM01XXXV BC02T	Health & Wellness	25		25	-	-	2	1	
OEC1	126BSC01XXXOE C01T	XXX	40	60	100	3		-	3	2
Total Marks 700 Semester Credits 25									25	
*XXX rej Language	presents Discipline, *	COM Comm	on fo	or all U	G cour	ses,	*LA	N		

Credits Structure of B.Sc. II Semester

SEMESTER-I										
Catego	Course code	Title of	Marks			Te ho	eachi urs/v k	ng vee	Credi	Duratio n of
ry		the Paper	I A	SE E	Tota 1	L	Т	Р	t	exams (Hrs)
L3	126BSC02LANAEC 09T 126BSC02LANAEC 10T	Kannada Functional Kannada	4 0	60	100	4	-	-	3	2
	126BSC02LANAE C11T	English								2
	126COM02LANAE C012T	Hindi		60	100					
L4	126COM02LANAE C13T	Sanskrit	0			1	_	_	3	
	126COM02LANAE C14T	Marathi	0			4	-	-		
	126COM02LANAE C15T	Urdu								
	126COM02LANAE C16T	Arabic								
DSC2	126BSC02XXXD SC02T	XXX	4 0	60	100	4	-	-	4	2
	126BSC02XXXDS C02L	XXX	2 5	25	50	-	-	4	2	4
	126BSC02XXXDS C		4 0	60	100	4		-	4	2
DSC2	02T 126BSC02XXXD SC02I	XXX XXX	2 5	25	50	-	-	4	2	4
AEC1	126COM02XXX AEC01T	Environm ental Studies	25	25	50	1	_	2	2	2
VBC3	126COM02XXXVB C03B	Physical Education & Sports	25		25	-	-	2	1	
VBC4	126COM02XXXVB C04T	NCC/NSS/R& R(S&G) / Cultural	25		25	-	-	2	1	
OEC2	126BSC02XXXOE C01T	XXX	40	60	100	3		-	3	2
	Total Marks700Semester Credits25									
* L	XXX represents Disc anguages	ipline, *COM (Com	mon fo	or all U	G co	ourse	s, *L	AN	

Bagalkot University, Jamkhandi

Discipline Specific Core Subject codes of Science stream for first and second semester

S1.	Subject	Category	Sem	Course code	Title
No			e		
1		DCC 1	ster		
1	Chemistry	DSC I	1	126BSC01CHEDSC01T	Chemistry-1
		DSC1	Ι	126BSC01CHEDSC01L	Chemistry Lab-1
		DSC 2	II	126BSC02CHEDSC02T	Chemistry-2
		DSC 2	II	126BSC02CHEDSC02L	Chemistry Lab-2
2.	Physics	DSC 1	Ι	126BSC01PHYDSC01T	Mechanics & Properties
					ofMatter
		DSC1	Ι	126BSC01PHYDSC01L	Practical I
		DSC 2	II	126BSC02PHYDSC02T	Electricity and Magnetism
		DSC 2	II	126BSC02PHYDSC02L	Practical II
3	Mathematics	DSC 1	Ι	126BSC01MATDSC01T	Algebra - I and Calculus
					-I
		DSC1	Ι	126BSC01MATDSC01L	Theory based Practical's
					on Algebra -I
					andCalculus – I
		DSC 2	II	126BSC02MATDSC02T	Algebra - II
					andCalculus -
					II

		DSC 2	II	126BSC02MATDSC02L	Theory based Practical's
					on Algebra- II and
					Calculus – II
4	Botany	DSC 1	Ι	126BSC01BOTDSC01T	Microbial Diversity and
					technology
		DSC1	Ι	126BSC01BOTDSC01L	Microbial Diversity and
					technology
		DSC 2	Π	126BSC02BOTDSC02T	Diversity of Non flowering plants
		DSC 2	ΙΙ	126BSC02BOTDSC02L	Diversity of Non flowering plants
5	Zoology	DSC 1	Ι	126BSC01ZOODSC01T	Cytology, Genetics
					and Infectious
		DSC1	т	12685002700050011	Cell Biology and
		DSCI	1		Genetics
		DSC 2	Π	126BSC02ZOODSC02T	Biochemistry and Physiology
		DSC 2	II	126BSC02ZOODSC02L	Physiological,
					Biochemical &
			_		Hematology
6	Electronics	DSC 1	I	126BSC01ELEDSC01T	Electronic Devices and Circuits.
		DSC 1	Ι	126BSC01ELEDSC01L	Practical I
		DSC 2	ΙΙ	126BSC02ELEDSC02T	Analog and Digital Electronics
		DSC 2	II	126BSC02ELEDSC02L	Practical II
7	Statistics	DSC1	Ι	126BSC01STSDSC01T	Descriptive Statistics
		DSC 1	Ι	126BSC01STSDSC01L	Practical Course I
		DSC 2	II	126BSC02STSDSC02T	Probability and Distributions

		DSC 2	Π	126BSC02STSDSC02L	Practical Course II
8	Biotechnology	DSC 1	Ι	126BSC01BITDSC01T	Cell Biology andGenetics
		DSC 1	Ι	126BSC01BITDSC01L	Cell Biology andGenetics lab
		DSC 2	II	126BSC02BITDSC02T	Microbiological methods & Techniques
		DSC 2	II	126BSC02BITDSC02L	Microbiological methods & Techniques lab
9.	Microbiology	DSC 1	Ι	126BSC01MIBDSC01T	General Microbiology
		DSC 1	Ι	126BSC01MIBDSC01L	Microbiol ogyLab-1
		DSC 2	II	126BSC02MIBDSC02T	Microbial Biochemistry and
		DSC 2	п	126DSC02MIDDSC02I	Physiology
		DSC 2		120DSC02MIDDSC02L	ogyLab-2
10	Computer Science	DSC1	Ι	126BSC01CSCDSC01T	Computer Fundamentalsand Programming in C
		DSC1	Ι	126BSC01CSCDSC01L	C Programming Lab
		DSC2	II	126BSC02CSCDSC02T	Data Structures using C
		DSC2	II	126BSC02CSCDSC02L	Data structures Lab
11	Geography	DSC1	Ι	126BSC01GEGDSC01T	Principles of
					Geomorpholo
					ду
		DSC1	Ι	126BSC01GEGDSC01L	Topographical Analysis
		DSC2	II	126BSC02GEGDSC02T	Introduction
					to
					Climatology
		DSC2	II	126BSC02GEGDSC02L	Weather Analysis



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301 DIST: BAGALKOTE

CHEMISTRY

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi Applicable from the Academic Year 2023-24 **CHEMISTRY:** Proposed Curricular and Credits Structure under Choice Based Credit System [CBCS] of Chemistry subject as Major & One Minor Discipline Scheme for the Three years/ Four Years B.Sc. / B.Sc. Chemistry Undergraduate Honors Programme with effect from 2023-24

	SEMESTER- I									
Cate g	Course code	Title of the Paper	Marks			Teaching hours/we ek			Credi t	Durati onn of exams
ory			IA	SE E	Total	L	Τ	Р		(Hrs)
DSC1	126BSC01CHED SC01T	Chemistry-1	40	60	100	4	-	-	4	2
	126BSC01CHED SC01L	Chemistry Lab-1	25	25	50	-	-	4	2	4
OEC1	126BSC01CHEOEC 01T	Chemistry in daily life	40	60	100	3	_	-	3	2

SEMES	SEMESTER-II												
Catego ry	Course code	Title of the Paper	Marks			Marks Teaching hours/wee k					ing wee	Cre di t	Duratio n of exams (Hrs)
			IA	SE E	Tot al	L	Т	Р					
DSC2	126BSC02CHED SC02T	Chemistry-2	40	60	100	4	-	-	4	2			
	126BSC02CHED SC02L	Chemistry Lab-2	25	25	50	-	-	4	2	4			
OEC2	126BSC02CHEO EC02T	Molecules of life	40	60	100	3	-	-	3	2			

ASSESSMENT METHODS Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2 nd Internal Assessment Test for 30 marks 1 hr after 15 weeks. Average of two tests should be considered.	30
Assignment	10
Total	40

Assessment Criteria	25 marks
1 st Internal Assessment Test for 20 marks 1 hr after 8 weeks and 2 nd Internal Assessment Test for 20 marks 1 hr after 15 weeks. Average of two tests should be considered.	20
Assignment	05
Total	25

Practical:

Assessment Criteria					
Semester End Internal Assessment Test for 20 marks 2 hrs	20				
Journal (Practical Record)	05				
Total	25				

Question Paper Pattern: I Semester B.Sc.

Duration: 2hr Sub: Code: :60

Maximum Marks

a. Answer any SIX Questions from Question 1

b. Answer any Three in each Question from 2,3,4 and 5questions.

Q.No.1.	Answer any SIX Questions (Two question from each Unit) a. b. c. d, e. f. g. h.	2X6=12
Q.No.2.	(Should cover entire unit-I) a. b. c. d.	4X3=12
Q.No.3.	(Should cover Entire Unit-II) a. b. c. d.	4X3=12
Q.No.4.	(Should cover Entire Unit-III) a. b. c. d.	4X3=12
Q.No.5.	(Should cover Entire Unit-IV) a. b. c. d.	4X3=12

BSc (Hons) Chemistry-Semester 1 Title of the Course: DSC-1: Subject code: 126BSC01CHEDSC01T

Number of Theory Credits	Number of lecture hours/ semester	Number of practical credits	Number of practical hours / semester
4	56	2	56
Content of Theorem	ry Course 1	•	

Paper: Chemistry – 1

Unit – 1 Analytical chemistry

14 hours

Definitions of analysis, determination, measurement, techniques and methods. Classification of analytical techniques. Choice of an analytical method - accuracy, precision, sensitivity, selectivity, method validation. Figures of merit of analytical methods and limit of detection (LOD), Limit of quantification (LOQ)

Errors and treatment of analytical data: Limitations of analytical methods – Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors. Statistical treatment of finite samples -mean, median, range, standard deviation and variance. Numerical problems

Titrimetric analysis: Basic principle of titrimetric analysis. Classification, Preparation and dilution of reagents/solutions. Preparation of ppm level solutions from source materials (salts), conversion factors.

Acid-base titrimetry: Theory, Titration curves for all type of acid- base titrations. Quantitative applications – selecting and standardizing a titrant,

Complexometric titrimetry: Indicators for EDTA titrations - theory of metal ion indicators, titration methods employing EDTA – direct and indirect determinations, Application determination of hardness of water.

Redox titrimetry: Titration curves, Theory of redox indicators, Applications of redox titrations.

Precipitation titrimetry: Titration curves, titrants and standards, indicators for precipitation titrations involving silver nitrate- Volhard's and Mohr's methods and their differences.

Unit - 2 Atomic structure & Periodicity of elements

14 hours

Atomic Structure: Review of Rutherford's atomic model, Bohr's theory, Hydrogen atomic spectra. Derivation of radius and energy of an electron in hydrogen atom, limitations of Bohr's theory, dual behavior of matter and radiation, de Broglie's equations, Heisenberg Uncertainty principle and their related problems. Quantum

numbers and their significance. Orbital s h a p es of s,p,d and f atomic orbitals, nodal planes. Rules for filling electrons in various orbitals, Electronic configurations of the atoms (atomic number up to 54).Concept of exchange energy. Anomalous electronic configurations. **9hrs**

Periodic properties of elements:

Brief account on the following properties of elements with reference to s and p-block and trends in groups and periods. Effective nuclear charge, screening effect, Slater rules, atomic and ionic radii, ionization enthalpy, electron gain enthalpy, and electronegativity, Pauling / Allred-Rochow scales of electronegativity. **5hrs**

Unit 3 Bonding in Organic Molecules and Mechanism of Organic reactions 14 hours

Classification and nomenclature of organic compounds, Hybridization, Shapes of organic molecules m Influence of hybridization on bond properties.

Nature of bonding in Organic molecules Types of chemical bonding, Formation of Covalent bond, localized and delocalized, conjugation and cross conjugation, concept of resonance, electronic displacements: Inductive effect, Electromeric effect, Resonance and Hyper conjugation with examples. Concept of resonance and aromaticity, Huckel rule, antiaromaticity explanation with examples. 6hrs

Mechanisms of Organic Reactions-I

Notations used to represent electron movements and directions of reactions- curly arrows, formal charges. Types of bonds breaking- homolytic and heterolytic. Types of reagents-Electrophiles, nucleophiles, nucleophilicity and basicity. Types of organic reactionssubstitution, addition, elimination, rearrangement and pericyclic reactions, explanation with examples.

Chemistry of Aliphatic hydrocarbons: Carbon-Carbon Sigma bonds Chemistry of alkanes: Formation of alkanes, Wurtz reaction, Wurtz-Fittig reaction, Free radical substitutions Mechanism of Halogenation- relative reactivity and selectivity 8hrs

Unit - 4 Gaseous State & Distribution Law

Gaseous state: Review of kinetic theory of gases, van der Waals equation of state Boyle temperature. Molecular velocity: Maxwell's Boltzmann distribution law of molecular velocities (most probable, average and root mean square velocities). Relation between RMS, average and most probable velocity and average kinetic energies (derivation not required). Collision frequency, collision diameter, Collision crosssection, collision number and mean free path. Critical phenomena: Andrews isotherms of CO₂, critical constants and their determination Relation between critical constants and van der Waals equation (Derivation), continuity of states, law of corresponding states. Numerical problems are to be solved wherever applicable. Distribution Law: Nernst Distribution Law - Statement and its derivation. Distribution constant, factors affecting distribution constant, validity of Distribution Law, Modification of distribution law when molecules undergo a) Association b) Dissociation. Application of Distribution Law in Solvent extraction. Derivation for simpleand multiple extraction. Principles of distribution law in Parkes Process of desilverisation of lead. Numerical Problems. **6hrs**

14hours

LEARNING OUTCOMES / COURSE OUTCOMES:

Chemistry as Discipline Specific Course (DSC)

B.Sc. Semester –I; CHEMISTRY-1

After successful completion of three year degree program in Chemistry a student should be able to;

- 1. Describe the dual nature of radiation and matter; dual behavior of matter and radiation, de Broglie's equations, Heisenberg Uncertainty principle and their related problems.
- 2. Electronic configurations of the atoms.
- 3. Define periodicity, explain the cause of periodicity in properties, and classify the elements into four categories according to their electronic configuration.
- 4. Define atomic radii, ionisation energy, electron affinity and electronegativity, discuss the factors affecting atomic radii, describe the relationship of atomic radii with ionisation energy and electron affinity, describe the periodicity in atomic radii, ionization energy, electron affinity and electronegativity.
- 5. Explain bond properties, electron displacement effects (inductive effect, electrometric effect, resonance effect and Hyper conjugation effect). Steric effect and their applications in explaining acidic strength of carboxylic acids, basicity of amines.
- 6. Understand basic concept of organic reaction mechanism, types of organic reactions, structure, stability and reactivity of reactive intermediates.
- 7. Describe important characteristics of configurationally and conformational isomers. Practice and write conformational isomers of ethane, butane and cyclohexane.
- 8. Understand the various concepts of geometrical isomerism and optical isomerism. Describe CIP rules to assign E,Z notations and R& S notations. Explain D and L configuration and *threo* and *erythro* nomenclature.
- 9. Explain racemic mixture and racemisation, resolution of racemic mixture through mechanical separation, formation of diastereomers, and biochemical methods, biological significance of chirality.
- 10. Explain the existence of different states of matter in terms of balance between intermolecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gases and real gases. Understand cooling effect of gas on adiabatic expansion.
- 11. Describe the conditions required for liquefaction of gases. Realise that there is continuity in gaseous and liquid state.
- 12. Explain properties of liquids in terms of intermolecular attractions.
- 13. Understand principles of titrimetric analysis.
- 14. Understand principles of different type's titrations. Titration curves for all types of acids base titrations.
- 15. Gain knowledge about balancing redox equations, titration curves, theory of redox indicators and applications.
- 16. Understand titration curves, indicators for precipitation titrations involving silver nitrate-Volhard's and Mohr's methods and their differences.
- 17. Indicators for EDTA titrations theory of metal ion indicators. Determination of hardness of water.

CHEMISTRY LAB (Inorganic and Organic Analyses)

After studying this course and performing the experiments set in it student will be able to:

- 1. Understand and practice the calibration of glass wares (burette, pipette, volumetric flask).
- 2. Basic concepts involved in titrimetric analysis, primary standard substances, preparation of standard solutions.
- 3. Explain the principles of acid-base, redox and iodometric titrations.
- 4. Work out the stoichiometric relations based on the reactions involved in the titrimetric analysis.
- 5. Based on principles of titrimetric analysis student can perform
- 6. Describe the significance of organic quantitative analysis.
- 7. Determine the amount of phenol, aniline, amide, ester and formaldehyde in a given solution by performing blank titration and main titrations.
- 8. Determine aspirin in the tablet by hydrolysis method.

Chemistry Lab-1: List of experiments to be conducted Course code: 126BSC01CHEDSC01L; Paper: Chemistry Lab-1

PART-A

- 1. Determination of sodium carbonate and sodium bicarbonate in a mixture
- 2. Determination of alkali present in soaps/detergents
- 3. Determination of oxalic acid using potassium permanganate solution
- 4. Standardization of EDTA solution and determination of hardness of water
- 5. Determination of phenol/aniline by bromination method
- 6. Determination of acetamide/ethylbenzoate by hydrolysis method

PART-B

- 7. Preparation of acetanilide from aniline using Zn/acetic acid (Green method)
- 8. Synthesis of p-nitro acetanilide from acetanilide using nitrating mixture
- Bromination of acetanilide (i) Conventional method and /or
 (ii) with ceric ammonium nitrate and potassium bromide (Green method).
- 10. Hydrolysis of methyl m-nitrobenzoate to m-nitrobenzoic acid (Conventional method)

Examination

In the practical examination, a batch of maximum 15 (Fifteen) students may be made. Anyone experiment from Part-A or B can be given by selection done by the students based on lots. **Viva questions must be asked on any of the experiments prescribed in the practical syllabus.**

Part A: Distribution of marks

- 1. Accuracy: 12 (6+6) Marks
- 2. Technique and presentation: 03Marks
- 3. Reactions and Calculations: 05 Marks

4. Viva: 05 Marks
Total 25 marks
Deduction of marks for accuracy: ±0.4 CC - 6 marks, ± 0.6 CC- 04 marks, ±0.8 CC- 02 marks, ±1.0 CC - 01 marks. Above ±1.0 CC - 00 marks.

Part B: Distribution of Marks:

- 1. Reaction & Mechanism-04 marks,
- 2. Calculation of theoretical yield 02 mark,
- 3. Observed yield -10 marks,
- 4. M.P-004 marks,
- 5. Viva-Voce-5 marks,

Total=25 marks.

Deduction of marks for observed yield: Less than 10% - 10 marks, 11-15% - 8 marks, 16-20% - 6 marks, 21-25% - 4 marks & above 25% - zero mark.

References

1. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, 6th edition, Third Indian Reprint, Pearson Education Pvt. Ltd.(2007).

2. Fundamentals of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch, 8th edition, Saunders College Publishing, New York (2005).

- 3. Analytical Chemistry, G.D. Christian, 6th edition, Wiley-India (2007).
- 4. Practical Volumetric Analysis, Peter A C McPherson, Royal Society of Chemistry, Cambridge, UK (2015).
- 5. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India)Pvt. Ltd. (Pearson Education)
- 6. Finar, I. L. *Organic Chemistry (Volume I)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education)
- 7. McMurry, J. E. *Fundamentals of Organic Chemistry*, 7th Ed. Cengage LearningIndia Edition, 2013
- 8. Organic Reaction mechanism by V. K. Ahluwalia and K. Parashar (Narosa Publishers).
- 9. Organic Chemistry by S. M. Mukherji, S. P. Singh and R. K. Kapoor. (Narosa Publishers)
- 10. A Guide book to mechanism in Organic Chemistry by Peter Sykes. Pearson.

BSc Semester 1 – B.Sc/(Hons) Chemistry Title of the Course: Open Elective (OE-1): CHEMISTRY IN DAILY LIFECourse code: 126BSC01CHEOEC01T

Courses	Credit s	No. of Classes /Week	Total No. of Lecture s/Hours	Duratio n of Examin hrs	Internal Assessme ntMarks	Semeste rEnd Exam Marks	Total Mark s			
Theory	03	03	42	2	40	60	100			
	Content of Theory Course 1									

Unit – 1

14 hours

Dairy Products: Composition of milk and milk products. Analysis of fat content, minerals in milk and butter. Estimation of added water in milk. Beverages: Analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy, determination of methyl alcohol in alcoholic beverages.

Food additives, adulterants, and contaminants- Food preservatives like benzoates, propionates, sorbates, disulphites. Artificial sweeteners: Aspartame, saccharin, dulcin, sucralose, and sodium cyclamate. Flavors: Vanillin, alkyl esters (fruit flavors), and monosodium glutamate. **Artificial food colorants:** Coal tar dyes and non-permitted colors and metallic salts. Analysis of pesticide residues in food.

Unit – 2

14 hours

14 hours

Vitamins: Classification and Nomenclature. Sources, deficiency diseases, and structures of Vitamin A1, Vitamin B1, Vitamin C, Vitamin D, Vitamin E & Vitamin K1.

Oils and fats: Composition of edible oils, detection of purity, rancidity of fats and oil. Tests for adulterants like argemone oil and mineral oils. Halphen test.

Soaps & Detergents: Definition, classification, manufacturing of soaps and detergents, composition and uses.

Unit – 3

Chemical and Renewable Energy Sources:

Principles and applications of primary & secondary batteries and fuel cells. Basics of solar energy, future energy storer.

Polymers: Basic concept of polymers, classification and characteristics of polymers. Applications of polymers as plastics in electronic, automobile components, medical fields, and aerospace materials. Problems of plastic waste management. Strategies for the development of environment-friendly polymers.

COURSE OUTCOMES: OEC-1 Chemistry

On completion of the course students will be able to:

- Understand the chemical constituents in various day today materials using by acommon man.
- □ Understand the chemical constituents in fertilizers, insecticides and pesticides, chemical explosives etc.
- \equiv Understand the chemical constituents in polymers, surface coatings etc.

References Text Books

- 1. B. K. Sharma: Introduction to Industrial Chemistry, Goel Publishing, Meerut (1998)
- 2. Medicinal Chemistry- Ashtoush Kar.
- 3. Analysis of Foods H.E. Cox: 13.
- 4. Chemical Analysis of Foods H.E. Cox and Pearson.

- Foods: Facts and Principles. N. Shakuntala Many and S. Swamy, 4thed. New AgeInternational (1998)
- 6. Physical Chemistry P l Atkins and J. de Paula 7thEd. 2002, Oxford University Press.

BSc Semester 2 – Chemistry (Hons)

Title of the Course: DSC-2: Subject code: 126BSC02CHEDSC02T Paper: Chemistry – 2

Number of Theory Credits	Number of lecture hrs/ semester	Number of practical Credits	Number of practical hrs/sem	
4	56	2	56	
С	ontent of Theory	Course 2	56Hr	
	-		S	

Unit – 1 Chemical bonding, molecular structure

14hours

Ionic Bonding: General characteristics of ionic compounds. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Born-Landé equation and calculation of lattice energy. Born-Haber cycle and its applications.

Polarizing power and polarizability: Fajan's rules, ionic character in covalent compounds and percentage of ionic character.

Covalent bonding: General characteristics of covalent compounds. VB approach, shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures of NO_3^- , CO_3^{2-} and SO_4^{2-} .

Molecular Orbital Theory: LCAO method, bonding and antibonding MOs and their characteristics for *s*-*s*, *s*-*p* and *p*-*p* combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules: H_2,O_2,N_2 and ions of 1^{st} and

 2^{nd} periods: He₂⁺¹, O₂ ⁺¹ and heteronuclear diatomic molecules such as CO,NO and NO⁺. Comparison of VB and MO approaches. Numerical problems are to be solved wherever applicable.

Unit - 2 Acidic Strengths of Organic compounds and Stereochemistry 14 hours

Strengths of Organic acid and bases: Comparative study with emphasis on factors effecting pKa values. Relative strength of aliphatic and aromatic carboxylic acids-Acetic acid and chloroacetic acid, acetic acid and propionic acid, acetic acid and Benzoic acid. Steric effect-Relative stability of trans and cis-2-butene.

Concept of Confirmational analysis with reference to Ethane & n-Butanewith staggered & eclipsed confirmations & energy profile diagrams.4hrs

Stereoisomersim: Definition of stereoisomerism, conformational isomers and configurational isomers (distinction between conformation and configuration). Newman, Sawhorse and Fischer projection formulae and their interconversions.

Geometrical isomerism: Definition, reason for geometrical isomerism, E and Z notation - CIP rules and examples, determination of configuration of geometric isomers by dipole moment method and anhydride formation method, *syn* and *anti* isomers in compounds containing C=N.

Optical isomerism: Chirality/asymmetry, enantiomerism, diastereomerism and meso

compounds. R and S notations (compounds with two asymmetric centers), D and L configurations and threo and erythro nomenclature, racemic mixture and racemization. Resolution: Definition, Resolution of racemic mixture by: i) Mechanical separation ii) Formation of diastereomers iii) Biochemical methods. Biological significance of chirality. 10hrs

Unit - 3 Solids & Liquid crystals

Liquid Crystals: Explanation, classification with examples- Smectic, nematic, cholesteric, disc shaped and polymeric. Structures of nematic and cholesteric phases-moleculararrangements in nematic and cholesteric liquid crystals. Applications of liquid crystals in LCDsand thermal sensing. 6hrs

Solids: Types of solids. Unit cell and space lattice, anisotropy of crystals, size and shape of crystals, Laws of Crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of symmetry, Symmetry elements, X-Ray diffraction by crystals: Bragg's law and derivation of Bragg's equation, Structure of NaCl. KCl and CsCl, Defects in crystals, glasses and liquid crystals. Numerical problems. 8hrs

Unit - 4 Chemical Kinetics I, Liquid state & Gravimetric Analysis 14hours

Chemical Kinetics I: Review of reaction rates, order and molecularity. Factors affecting rates of reaction: concentration pressure, temperature, catalyst, etc. Examples for different orders of reactions. Derivation of integrated rate equations for zero and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction (numerical problems). Methods for determination of order of a reaction by half-life period and differential equation method. **3hrs**

Liquid state: Molecular forces and general properties of liquids.

Surface tension: surface tension, surface energy, effect of temperature on surface tension, shapes of liquid drops and soap bubbles, capillary action, determination of surface tensionby capillary r ise method, drop weight and drop number methods using stalagmometer. Effect of temperature on surface tension. Parachor, Additive and constitutive properties: atomic and structural parachor. Elucidation of structure of benzene and benzoquinone...

Viscosity: Definition, viscosity coefficient, fluidity, molecular viscosity, relative viscosity and absolute viscosity, determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature, size, weight, shape of molecules and intermolecular forces.

Refractive index: Definition, Specific and molar refraction. Determination of refractive index using Abbe's refractometer. Additive and constitutive properties: Numerical problems are to be solved wherever applicable. 7hrs

Gravimetric Analysis: Stages in gravimetric analysis, requisites of precipitation, factors influencing precipitation, co-precipitation and post-precipitation. Structure, specificity, conditions and applications of organic reagents such as salicylaldoxime, oxine, dimethylglyoxime, cupron in inorganic analysis. 4hrs

14 hours

Reference Books

1. Inorganic Chemistry

- 1. Lee, J.D. Concise Inorganic Chemistry ELBS, 1991.
- 2. Cotton, F.A., Wilkinson, G.& Gaus, P.L. *Basic InorganicChemistry*,3rded.,Wiley.
- 3. Douglas, B.E., McDaniel, D.H. & Alexander, J. J. Concepts and Models in Inorganic Chemistry, John Wiley & Sons.
- 4. Huheey, J. E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.
- 5. Shriver, D.F. & Atkins, P.W. Inorganic Chemistry, Oxford University Press.
- 6. Wulfsberg, G. Inorganic Chemistry, Viva Books Pvt. Ltd.
- 7. Rodgers, G.E. Inorganic & Solid State Chemistry, Cengage Learning India Ltd., 2008.
- 8. Mark Weller and Fraser Armstrong, 5th Edition, Oxford University Press (2011-2012) Adam, D.M. *Inorganic Solids: An introduction to concepts in solid-state structuralchemistry*. John Wiley & Sons, 1974.
- 9. G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
- 10. Mahan, B.H. University Chemistry 3rd Ed. Narosa (1998).
- 11. Petrucci, R.H. General Chemistry 5thEd. Macmillan Publishing Co.: New York (1985).

Organic Chemistry

- 1. Organic Chemistry-P. Y. Bruice, 7th Edition, Pearson Education Pvt. Ltd., New Delhi(2013).
- 2. Heterocyclic Chemistry- R. K. Bansal, 3rd Edition, New- Age International, NewDelhi,2004
- 3. McMurry, J.E. *Fundamentals of Organic Chemistry*,7thEd. Cengage Learning IndiaEdition, 2013.
- 4. Sykes, P.A Guidebook to Mechanism in Organic Chemistry, Orient Longman, NewDelhi(1988).
- 5. Stereochemistry-Conformation and Mechanism-P. S. Kalsi, Wiley-Eastern Ltd, NewDelhi.
- 6. Morrison, R.T.&Boyd, R.N. Organic Chemistry, Pearson, 2010.
- 7. Bahl, A.& Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.
- 8. Graham Solomons, T.W., Fryhle, C.B. & Snyder, S.A. *Organic Chemistry*, John Wiley & Sons(2014).
- 9. Organic Chemistry Volume-I, II- I. L. Finar, 6th Edition, ELBS London (2004).
- 10. Organic Chemistry-F.A. Carey, 4th Edition, McGraw Hill (2000).
- 11. Modern Organic Chemistry R.O.C. Norman and D.J. Waddington, ELBS, 1983
- 12. Understanding Organic reaction mechanisms A. Jacobs, Cambridge Univ. Press, 1998
- 13. Organic Chemistry L.Ferguson, Von Nostrand, 1985
- 14. Organic Chemistry M. K. Jain, Nagin & Co., 1987
- 15. Organic Chemistry-Mehta and Mehta.

Physical Chemistry

- 1. Barrow, G.M. Physical Chemistry Tata Mc Graw-Hill(2007).
- 2. Castellan, G.W. *Physical Chemistry* 4th Ed.Narosa(2004).
- 3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. *General Chemistry* Cengage Learning India Pvt.Ltd.,New Delhi(2009).
- 4. P.W. Atkins: PhysicalChemistry.
- 5. W.J. Moore: PhysicalChemistry
- 6. Text Book of Physical Chemistry P.L. Soni, S. Chand & Co., 1993
- 7. Text Book of physical chemistry S. Glasstone, Mackmillan India Ltd., 1982

- 8. Principles of Physical Chemistry B. R. Puri, L.R. Sharma and M.S.Patania, S.L.N.Chand & Co. 1987
- 9. Physical Chemistry Alberty R. A. and Silbey, R.J.John Wiley and sons, 1992
- 10. Physical Chemistry G.M.Barrow, McGraw Hill, 1986
- 11. Physical Chemistry(3rd Edition) Gilbert W. Castilian, Narosa Publishing House, 1985
- 12. Chemical Kinetics by K. J. Laidler, Tata McGraw Hill Publishing Co., New Delhi.
- 13. Kinetics and Reaction Mechanisms by Frost and Pearson, Wiley, New York.

Analytical Chemistry

- 1. Jeffery, G.H., Bassett, J., Mendham, J. & Denney, R.C. *Vogel's Textbook of Quantitative Chemical Analysis*, JohnWiley&Sons, 1989.
- Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. *Instrumental Methods of Analysis*,7thEd. Wadsworth Publishing Company Ltd.,Belmont, California, USA, 1988.
- 3. Christian, G.D; Analytical Chemistry, VI Ed. John Wiley & Sons, NewYork, 2004.
- 4. Harris, D.C. Exploring Chemical Analysis, Ed.New York, W.H. Freeman, 2001.
- 5. Skoog, D.A. Holler F.J. & Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Ed.

Content of Chemistry Lab-2: List of Experiments to be conducted

Title of the Course: DSC-2: Subject code: 126BSC02CHEDSC02L

; Paper: Chemistry Lab-2

PART-A Inorganic Chemistry

A.1. TITRIMETRY

- 1. Determination of carbonate and hydroxide present in a mixture.
- 2. Standardization of potassium permanganate solution and determination of nitrite in awater sample
- 3. Determination of chlorine in bleaching powder using iodometric method.
 - A.2. GRAVIMETRY
- 1. Determination of Ba²⁺ as BaSO4
- 2. Determination of Cu^{2+} as CuSCN

PART-B Physical Chemistry

- 1. Determination of density using specific gravity bottle and viscosity of liquids using Ostwald's viscometer (Ethyl acetate, Toluene, Chloroform, Chlorobenzene or any other non-hazardous liquids).
- 2. Study of the variation of viscosity of sucrose solution with the concentration of a solute.
- 3. Determination of the density using specific gravity bottle and surface tension of liquids using Stalagmometer (Ethyl acetate, Toluene, Chlorobenzene, any other non-hazardous liquids.
- 4. Study of variation of surface tension of detergent solution with concentration.
- 5. Determination of specific and molar refraction by Abbes Refractometer. (Ethyl acetate, Methyl acetate, Ethylene Chloride).
- 6. Determination of the composition of liquid mixture by refractometry. (Toluene & Alcohol, Water & Sucrose).

** Standard solution is to be prepared by students for both in regular and in practical examination.

Examination

In the practical examination, a batch of maximum 15 (Fifteen) students may be made. Anyone experiment from Part-A or B can be given by selection done by the students based on lots. **Viva questions must be asked on any of the experiments prescribed in the practical syllabus.**

Part A1: Distribution of marks

- 1. Accuracy: 12 (6+6) Marks
- 2. Technique and presentation: 03Marks
- 3. Reactions and Calculations: 05 Marks
- 4. Viva: 05 Marks

Total 25 marks

Deduction of marks for accuracy: ± 0.4 CC – 6 marks, ± 0.6 CC- 04 marks,

±0.8 CC- 02 marks, ±1.0 CC - 01 marks. Above ±1.0 CC - 00

marksPart A2: Distribution of marks

- 1. Accuracy: 12 Marks
- 2. Technique and presentation: 03Marks
- 3. Reactions and Calculations: 05 Marks

4. Viva: 05 Marks

Total 25 marks

Deduction of marks for accuracy: ± 6 mg – 12 marks, ± 7 mg- 10 marks,

±8mg - 08 marks, ±10 mg - 06 marks. Above 10mg - 00 marks

Part B: Distribution of marks

- 1. Accuracy: 12 Marks
- 2. Technique and presentation: 03marks
- 3. Graphs and Calculations: 05 Marks
- 4. Viva: 05 Marks

Total 25 marks

Deduction of marks for accuracy: Error up to 5% - 12 marks, 6 - 10% 09 marks, 11-15% 6 marks, 16% or above 3 marks.

B.Sc. Semester –II

Open Elective Course-Chemistry

Title of the Course: OEC-2: Subject code: 126BSC02CHEOEC02T;

Paper: Molecules of Life

Course	Credit s	No. of Classe s/ Week	Total No. of Lecture Hours	Duration of Exam inhrs	Internal Assessme ntMarks	Semest erEnd Exam Marks	Tota l Mark s
Theory	03	03	42	2	40	60	100

UNIT I

Carbohydrates

Sugars, non-sugars, reducing and non-reducing sugars. Occurrence and general properties of glucose and fructose. Open chain and Haworth ring structures of glucose and fructose. Epimers, mutarotation and anomers.

Disaccaharides: Occurance of disaacharides (Sucrose, Maltose and Lactose). Glycosidic linkage in disaccharides. Ring structures of sucrose, maltose and lactose. Polysaccharides: Starch – monomer units, glycosidic linkage, components-difference in their structure (explanation only) and solubility in water. Cellulose and glycogen– monosaccharide, glycosidic linkage, structure (explanation only).Biological importance of carbohydrates **Shrs**

Amino Acids, Peptides and Proteins

 α - amino acids , general formula, zwitter ion form of α - amino acid, general formula. Isoelectric point and its importance. Classification of amino acids as essential andnonessential-examples. Configuration of optically active α -amino acids (found in proteins). Peptide bond. Proteins: classification based on molecular shape–fibrous and globular, examples. Structure of protein – qualitative idea about primary, secondary, tertiary, and quaternary structures (diagrams not required).Denaturation of protein.

UNIT II

Enzymes and correlation with drug action

Mechanism of enzyme action, factors affecting enzyme action, Co-enzymes and cofactors and their role in biological reactions, Specificity of enzyme action (including stereo specificity),Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Non-competitive inhibition including allosteric inhibition). **7hrs**

Drug action- Receptor theory. Structure–activity relationships of drug molecules, bindingrole of –OH group, -NH2 group, double bond and aromatic ring.4hrsOils and fats

Biological Importance of oils and fats. Fatty acids (saturated, unsaturated fatty acids, formation of triglycerides and general formula of triglycerides. Chemical nature of oils and

8hrs

fats-saponification, acid hydrolysis, rancidity and its prevention methods, refining of oils, hydrogenation of oils, drying of oils. Iodine value.

Introduction to lipids, classification. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol). 6hrs

UNIT III

Nucleic Acids

Components of nucleic acids: Adenine, guanine, thymine and cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crickmodel) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation. **6hrs**

Vitamins and Hormones

Classification and biological significance, source and structure of Vitamin A, B1 (thiamine), B2 (riboflavin), B6 (pyridoxine), α -tocopherol, K1 (phylloquinone), C (ascorbic acid). Deficiency diseases of vitamins,

Hormones: definition, classification with examples, functions and deficiency diseases of hormones. **5hrs**

Course Outcome / Learning Outcome:

After studying this paper the student would be able to

- 1. Acquire knowledge about different types of sugars and their chemical structures.
- 2. Identify different types of amino acids and determine the structure of peptides.
- 3. Explain the actions of enzymes in our body and interpret enzyme inhibition.
- 4. Predict action of drugs. Depict the biological importance of oils and fats. Importance of lipids in the metabolism Differentiate RNA and DNA and their replication. Explain production of energy in our body.

Reference Books:

- 1. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 2. Finar, I. L. *Organic Chemistry* (*Volume 1*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 3. Finar, I. L. *Organic Chemistry (Volume 2)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- 4. Nelson, D. L. & Cox, M. M. Lehninger's Principles of Biochemistry 7th Ed.,
- 5. W. H. Freeman. Berg, J.M., Tymoczko, J.L. &Stryer, L. Biochemistry, 2002.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

PHYSICS

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi, applicable from

theAcademic Year 2023-24

SUBJECT: PHYSICS

PROGRAM STRUCTURE

.

Curricular and Credits Structure under Choice Based Credit System [CBCS] of Physics Major & One Minor Discipline Scheme for the Three year/Four Year Physics B.Sc/B.Sc. Honors Programme with effect from 2023-24.

SEMESTER-I										
Category ry	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duratio n of
			IA	SEE	Total	L	Т	Р		exams (Hrs)
DSC1	126BSC01PHYD SC01T	Mechanics & Properties of Matter	40	60	100	4	-	-	4	2
	126BSC01PHYDS C01L	Practical I	25	25	50	-	-	4	2	4
OEC1	126BSC01PHYOE C01T	Energy Sources	40	60	100	3		-	3	2

SEMESTI	SEMESTER-II									
Category	Course code	Title of	Marks			Teaching hours/wee k			Cred	Duration of exams
		tne Paper	IA	SE	Tot	L	Τ	Р	IL	(Hrs)
		- • ·P • -		E	al					
DSC2	126BSC02PHYDS C02T	Electricity and Magnetism	40	60	100	4	_	-	4	2
	126BSC02PHYDS C02L	Practical-II	25	25	50	-	-	4	2	4
OEC2	126BSC02PHYOEC 02T	Optical Instrumen ts	40	60	10 0	3	-	-	3	2

Course Content Semester–I Mechanics and Properties of Matter

Course Title: Mechanics and Properties of Matter	Course Credits:4
Total Contact Hours: 52	Duration of ESA:3hours
Formative Assessment Marks: 30	Summative Assessment Marks:70

Course Outcomes (COs)

CO-1: Will learn fixing units, tabulation of observations, analysis of data (graphical/analytical)

CO-2: Will learn about accuracy of measurement and sources of errors, importance of significant figures.

CO-3: Will know how g can be determined experimentally and derive satisfaction.

CO-4: Will see the difference between simple and torsional pendulum and their use in the determination of various physical parameters.

CO-5: Will come to know how various elastic moduli can be determined.

CO-6: Will measure surface tension and viscosity and appreciate the methods adopted.

CO-7: Will get hands on experience of different equipment.
COURSE-WISESYLLABUS

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Semester I

Mechanics and Properties of Matter

Year	Ι	Course Code: 126BSC01PHYDSC01T Cre			s 04	
Sem.	1	Course Title: Mech	anics and Properties of Matter	Hours	52	
Course	Pre-re	quisites, if any	NA	1		
Format	Formative Assessment Marks:40 Summative Assessment Marks:60 Duration of		of ESA:	2hrs.		
Unit N	0.		Course Content	I	Hours	
ControlConservation Laws: Law of conservation of linear momentum. Centre of mass and expression for position vector, velocity, acceleration and force of Centre of mass. Distinction between laboratory frame of reference and centre of mass frame of reference. Concept of elastic collision and inelastic collisions. Derivation of final velocities in case of elastic collision in (i) laboratory frame of reference (ii) centre of mass frame of reference. Derivation of final velocities in case of inelastic collision in (i) laboratory frame of reference (ii) centre of mass frame of reference. Conservation of linear momentum in case of variable mash. Principle of rocket and derivation for equation of motion for single stage rocket. Necessity of multi stage rocket. Basics of angular momentum and torque, relation between angular momentum and torque. Law of conservation of angular momentum with examples. Concept of work and power. Law of conservation of energy with examples. Work energy theorem. Simple harmonic oscillations of light spiral		e of e of entre ons. ame ities re of able tage and tion w of onic	13			
Activ Self St	 spring. Problems 1Students can try and find every day examples of conservation of energy. For example: i) What happens in solar panels ii) Pushing an object on the table it moves iii) Moving car hits a parked car cause's parked car to move. In these cases, energy is conserved. How? Understand and verify if possible. 			For le.		
Unit	Gravitation: Newton's law of Gravitation (statement). Expressions for escape velocity and orbital velocity. Kepler's laws of planetary motion. Derivation for Kepler's 2nd and 3rd law. Concept of Satellite, derivation for binding energy of satellite. Artificial Satellite: Geostationary satellite and polar orbit satellite with different types of orbits (qualitative). Concept of weightlessness. Basic ideas of G.P.S. and NAVIC. Problems Rigid Body Dynamics: Moment of Inertia. Radius of Gyration. Statements of theorem of parallel axis and theorem of perpendicular axis. Derivation of expressions for moment of inertia for (i) rectangular lamina (ii) thin uniform rod and (iii) circular disc. Theory of compound pendulum and bar pendulum. Theory of flywheel and its applications. Problems		cape 1 for ergy ellite sasic s of 1 of prm um.	13		
Activ Self St	Activity/ Self Study 1 . Moment of inertia is an abstract concept. It simply gives a measure of rotational inertia of a rigid body. It is proportional to the product of the square of radius, r of the body and its mass, m. Students by referring to websites, can construct and perform simple experiments to verify that MI α mr ² .		e of uare can			

	2. Performing experiments on gravity and Kepler's laws are somewhat difficult. However, students can prepare suitable charts, understand and give Seminar talks in the class. Websites can help in this regard.	
Unit III	Elasticity: Definition of Stress-strain, Hooke's law. Types of elastic constants. Modulus of elasticity and derivation of expression for relation between elastic constants, Poisson's ratio, expression for Poisson's ratio in terms of elastic constants. Work done in stretching and twisting wire. Theory of torsional pendulum, determination of rigidity modulus and time period. Bending moments. Theory of cantilever. Determination of Young's modulus by bending of beam supported at its ends and loaded at middle. Problems	13
Activity/ Self Study	 Verification of Hook's law Arrange a steel spring with its top fixed with a rigid support on a wall and a meter scale alongside. Add 100 g load at a time on the bottom of the hanger in steps. This means that while putting each 100g load, we are increasing the stretching force by 1N. Measure the extension for loads up to 500g. Plot a graph of extension versus load. Shape of the graph should be a straight line indicating that the ratio of load to extension is constant. Go for higher loads and find out elastic limit of the material. Repeat the above experiment with rubber and other materials and find out what happens after exceeding elastic limit. 	
Unit IV	Surface tension: Definition of surface tension, Angle of contact, Surface energy, relation between surface tension and surface energy, pressure difference across curved surface. Excess of pressure inside spherical liquid drop, Capillary rise, derivation of expression for rise of liquid in a capillary tube. Determination of surface tension by Quinke's method. Effect of temperature, impurity on surface tension. Problems Viscosity: Streamline flow, turbulent flow, equation of continuity, determination of coefficient of Viscosity by Poisulle's method, Stokes law with derivation and expression for terminal velocity. Effect of temperature on viscosity. Problems	13
Activity/ Self study	 Measure surface tension of water and other common liquids and compare and learn Why water has high ST? Give reasons. Check whether ST is a function of temperature? You can do it by heating the water to different temperatures and measure ST. Plot ST. versus T and learn how it behaves. Whix some quantity of kerosene or any oil to water and measure ST. Check whether ST for the mixture is more or less than pure water. Give reasons. Collect a set of different liquids and measure their viscosity. Find out whether sticky or non-sticky liquids are most viscous. Think of reasons. Mix non-sticky liquid to the sticky liquid in defined quantities and measure viscosity. Find out whether viscosity is increasing or decreasing with increase of non-sticky liquid concentration. Do the above experiment by mixing sticky liquid to then on-sticky liquid. Find out change in viscosity with increase of concentration of sticky liquid. Think why one should know viscosity of the liquid. 	

Recommended Leaning Resources						
Text Books	 Kt Books 1. Mechanics by D.S. Mathur, NewEdition2000, S.Chand & Co. 2. Classical Mechanics by J. C.Upadhya, 2019, Himalaya Publishers. 3. Mechanics and Relativity by Vidwan Singh Soni,3rd Edition, PHIL earning Pvt. Ltd. 4. Mechanics Berkeley Physics Course, Vol.1: Charles Kittel,<i>et.al</i>.2007, Tata 					
	 5. Engineering Mechanics, Basudeb Bhattacharya, 2ndEdn, 2015, Oxfo University Press. 6. Elements of properties of matter by D.S.Mathur, 2010,S.Chand&Co. 7. Properties of Matter by Brijlal & Subramanyam. 					
Reference Books	 Physics: Resnick, Halliday&Walter, 9thEdn,2010, Wiley. Physics by Halliday and Resnick,Vol1. University Physics, RonaldLaneReese,2003,ThamsonBrooks/Cole. 					

Laboratory Experiments:

NOTE: Minimum of Eight experiments has to be performed

Year	Ι	CourseCode:126BSC01PHYDSL		Credits	2	
Sem.	1	Course Title: Pra	ctical-I		Hours	4
					hrs/week	
Format	ive As	sessment Marks:25	Summative Assessment Marks:25	Duration	of ESA:4	hrs.
Sl. No			Experiment			
1		Determination of g	using bar pendulum (L versus T and L ve	ersus LT ²	graphs)	
2		Determination of n	noment of inertia of a Fly Wheel			
3		Determination of n	noment of inertia of an irregular body			
4		Determination of ri	gidity modulus using torsional pendulum			
5		Verification of parallel axis theorem				
6		Verification of per	pendicular axis theorem			
7		Determination of Y	oung's Modulus of a bar by bending meth	nod		
8		Verification of Hoo	ok's Law by Searle's method.			
9		Young's modulus l	by cantilever–Load versus Depression grap	ph		
10		Young's modulus h	y Koenig's method			
11		Young's modulus l	by stretching (Searle's apparatus).			
12		Modulus of rigidity (twisting)				
13		Viscosity by Stoke	s method			
14	14 Radius of capillary tube by mercury pellet method					
15	Surface tension by drop weight method					
16	16 Critical pressure for streamline flow					
	Recommended Leaning Resources					

Text Books	1.Practical Physics-M.A.Hipparagi
Reference	1. Physics through experiments, by B. Saraf, 2013, Vikas Publications.
Books	 A lab manual of Physics for under graduate classes, ¹Edition, Vikas Publications. BSc Practical Physics by CL Arora, Revised Edition 2007, S. Chand & Co.4.Anadvancedcoursein practical physics, D. Chattopadhyay, PC Rakshit, P. Saba
	Revised Edition 2002, New Central Book Agency Pvt Ltd.

OPEN-ELECTIVESYLLABUS:

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Year	Ι	Course Code: 126BSC01PHYOEC01T		Credits	03
Sem.	1	Course Title: Energy Sources		Hours	40
Formative Assessment Marks:40		Summative Assessment Marks:60 Duration of ESA: 02hrs.			
Unit N	lo.	Course Content		Hour	S
Unit I		Introduction: Energy concept-sources in general, its sign necessity. Classification of energy sources: Primary and Second Commercial and Non-commercial energy, Renewable and Non energy, Conventional and Non-conventional energy, Based on Origin-Examples and limitations. Importance of Non-commer resources.	nificance & dary energy, n-renewable rcial energy	05	
Unit I		Renewable energy sources: Need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, Biogas generation geothermal energy tidal energy. Hydroelectricity.		05	
Unit II		Conventional energy sources: Fossil fuels & Nuclear energy-production & extraction, usage rate and limitations. Impact on environment and their issues & challenges. Overview of Indian & world energy scenario with latest statistics-consumption & necessity. Need of eco-friendly & green energy & their related technology			
Unit III		 Solar energy: Solar Energy-Key features, its importance, Merits & demerits of solar energy, Applications of solar energy. Solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell –brief discussion of each. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun Tracking systems 		10	
Unit IV G		Fundamentals of Wind energy, Wind Turbines and different machines in wind turbines, Power electronic interfaces interconnection topologies. Ocean Energy Potential against Solar, Wave Characteristics and Statistics, Wave Energy Decharacteristics and Statistics, Tide Energy Technologies, Ocean Energy.Geothermal and hydro energy:Geothermal Resources, Ocean	nt electrical , and grid Wind and evices. Tide n Thermal Geothermal	08	

Technologies. Hydropower resources, hydropower technologies,	
Environmental impact of hydropower sources.	
Activity	
1. Demonstration of on Solar energy, wind energy, etc, using training	
modules at Labs.	
2. Conversion of vibration to voltage using piezoelectric materials.	
3. Conversion of thermal energy into voltage using thermoelectric (using	
thermo couples or heat sensors) modules.	
4. Project report on Solar energy scenario in India	
5. Project report on Hydro energy scenario in India	
6. Project report on wind energy scenario in India	
7. Field trip to nearby Hydroelectric stations.	
8. Field trip to windenergy stations like Chitradurga, Hospet, Gadag, etc.	
9. Fieldtrip to solar energy parks like Yeramaras near Raichur.	
10. Videos on solar energy, hydro energy and wind energy.	
Reference Books:	
1. Non-conventional energy sources- G.DRai-Khanna Publishers,	
New Delhi	
2. Solar energy-M P Agarwal- S Chand and Co. Ltd.	
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing	
Company Ltd.	
4. Godfrey Boyle, "Renewable Energy, Power for a sustainable	
future", 2004, Oxford University Press, in association with The	
Open University.	
5. Dr. P Jayakumar, Solar Energy: Resource Assessment Handbook,	
2009	
6. J.Balfour, M. Shawand S. Jarosek, Photovoltaics, Lawrence J	
Goodrich (USA).	
http://en.wikipedia.org/wiki/Renewable_energy	

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Semester-II

Electricity & Magnetism

Course Title: Electricity and Magnetism	Course Credits: 4
Total Contact Hours: 52	Duration of ESA:2hours
Formative Assessment Marks: 40	Summative AssessmentMarks:60

	Course Outcomes(COs)			
i. I	Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.			
ii. I I	Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.			
iii. Appl	ly Gauss's law of electrostatics to solve a variety of problems.			
iv. Describe the magnetic field produced by magnetic dipoles and electric currents.				
v. I	Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.			
vi. I	Describe how magnetism is produced and list examples where its effects are observed.			
vii Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.				
vii. A I	Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity, •Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.			

Year	Ι	Course Code: 126BSC02PHYDSC02TCr		Cred	its	4	
Sem.	2	Course Title: Electricity and Magnetism		Hour	'S	52	
Course	Pre-rec	uisites, if any	NA				
Formati	ve Ass	essment Marks:40	Summative Assessment Marks:60	uration	of ESA	of ESA:2hrs.	
Unit No).		Course Content			Hours	
		Vector Analysis: Sc	alar and Vector Products. Gradient of sca	alar and	its		
		physical significance.	Divergence of vector and its physical signifi	cance. (Curl		
		of vector and its physical significance. Vector integration; line, surface &			e &		
		volume integrals of	a vector field. Gauss Divergence theorem	& Sto	okes		
Uni	t I	theorem (statement).	Problems				
Om	ι 1	Maxwell's Electrom	agnetic Theory: Derivation of Maxwell's e	quation	s in	1	3
		differential form. Mer	ntion of Maxwell's equations in integral for	m and t	heir		
		physical significances	s. Derivation for general plane wave equat	tion in	free		
		space. Transverse na Problems	ture of radiation. Derivation of Poynting	's theor	em.		
Activity	v/Salf	1100101113					
Activity	y/Sell dv	Solving problems on g	gradient, divergence & curl of a vector				
Stut	цу						
		DC Circuit Analysis	: Voltage and current sources. Kirchhoff's	current	and		
		voltage laws. Deriva	tion of Thevenin's Theorem. Derivation of	of Norto	on's	1	•
		Theorem. Derivation	of Superposition Theorem. Derivation of	Maxim	num	1	3
Unit	II	Power Transfer Theor	em. Problems	DI ·	•		
		Transient Circuits:	Theory of growth and decay of current in	RL circ	cuit.		
		af DL and DC sinewite	d discharging of capacitor in RC circuit. The	ie const	ants		
		of RL and RC circuits	. Measurement of high resistance by leakage	•			
		1 Solving problems of	n Thevenin's Norton's Superposition and N	laximu	n		
Activity	v/Self	Power Transfer Theor	rems	Tuximu	.11		
Stuc	dy	2. Charging and discha	arging of a capacitor through high resistance.				
		3.3.Measurment of tin	ne constant of RL and RC circuit.				
		Magneto statics: Sta	tement of Biot Savart's law. Derive an exp	ression	for		
		Magnetic field at a po	bint (1) due to a straight conductor carrying	current	(ii)		
		along the axis of the	circular coil carrying current (iii) along t	he axis	of		
		solenoid. Principle, c	construction and theory of Helmholtz Gal	vanome	ter.		
		Problems					•
		Alternating Current	Definitions of average, peak and rms values	of AC.	AC	1	3
Unit	III	circuits containing LR	, CR and their responses (using j operator). I	Expressi	ons		
		for impedance, curren	it & phase angle in series LCR circuit using	j opera	tor.		
		Expressions for admi	ittance and condition for resonance in par	rallel, L	CR		
		(sharphase half power	r fraguency quality factor, voltage magnific	resona	ince		
		Comparison between	Series resonance & parallel resonance. De	Sauty's			
		Bridge. Problems	series resonance & paranet resonance. Det	suary s			
A ati-it-	v/S -1f	1. Experiments to show	w the magnetic field due to straight conducto	r,			
Activity	y/Sell	circular coil and solen	loid.				
Sut	лу	2. Construction of Hel	mholtz coil using PVC pipe and copper wire	•			

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•	.To show the lagging of current and voltage in RL, RC and RL Ccircuits.				
Unit IV	 Electrical Instrument: Ballistic Galvanometer; Theory of Ballistic Galvanometer (Derivation for current and Charge). Constants of Ballistic Galvanometer and their relationship. Condition for moving coil galvanometer to be ballistic. Determination of self-inductance (L) by Rayleigh's method. Theory of Earth inductor, Measurement of B_H,Bv and angle of dip at a place. CRO block diagram. Use of CRO in the measurement of Voltage, Frequency and Phase. Problems Dielectrics: Types of dielectrics (polar and non-polar molecules). Electric dipole moment (p), electric polarization (P). Gauss law in dielectrics. Derivation for Relation between D, E and P. Derivation for relation between dielectric constant and electric susceptibility. Boundary conditions for E & D.Problems 	13			
Activity/Self- Study	 To show the working of Ballistic Galvanometer Working of CRO and its applications. 				
Recommended Leaning Resources					
Print	1) Electricity and magnetism by BrijLal and N Subrahmanyam, Rathan Prakas	shan			
Resources	Mandir, Nineteenth Edition, 1993.				
	2) Principles of Electronics by VK Mehta and Rohit Mehta, S Chand & Company, Eleventh Edition 2008				
	3) Fundamentals of Magnetism & Electricity: D.N.Vasudeva, S Chand Publica (2011)	ation,			
	 4) Fundamentals of Electricity and Magnetism–Basudev Ghosh (Books & Allied New Book Agency, Calcutta, 2009) 	v Central			
	5) Electricity & Magnetism: B.S.Agarwal, Kedarnath Ramnath Publication (2017).				
	6) Electricity and Magnetism with Electronics: Dr.K.K.Tewari,S. Chand Publications	(1995).			
	7) Fundamentals of electric circuit theory: Dr.D.Chattopadhyay & Dr.P.C.Rakshit,S.	Chand			
	Publications,7th Rev. Edn.(2006).				
	8) Electricity and Magnetism: John Yarwood, University Tutorial Press, (1973).				
	9) Electricity & Magnetism, N S Khare & S S Srivastava, AtmaRam & Sons, New De	lhi.			
	10) Electricity & Magnetism, D L Sehgal, K L Chopra, N K Sehgal, S Chand & Co, Sixth Edition (1988)				
	11) Electricity & Electronics, DC Tayal, Himalaya Publishing House, Sixth Edition (1988).				
	12) Electricity and Magnetism, SP Taneja, R Chand & Co. New Delhi.				

Laboratory Experiments:

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NOTE: Minimum of Eight experiments has to be performed

Year	Ι	Course Code: 126BSC02PHYDSC02L	Credits	2		
C.	2	Course Title: Practical-II	TT	4		
Sem.	Z		Hours	4 hrs/wook		
Formati		sessment Marks: 25 Summative Assessment Marks: 25 Duration	$h of FSA \cdot A$	hrs		
	ve As	Fyneriment	I UI LSA.4	1115.		
51. 110		Theyenin's & Norton's theorem (Ladder Network)				
1		The venini 's & Tvorton''s theorem (Ladder Tvetwork)				
2		Thevenin's & Norton's theorems (Whetstone Bridge)				
3		High resistance by leakage method				
4		Time constant of RC circuit by charging and discharging method.				
5		Calibration of Ammeter using Helmholtz Galvanometer				
6		Constants of Ballistic Galvanometer				
7		LCR series/parallel resonance circuit				
8		DeSauty's AC bridge				
9		Self-Inductance by Rayleigh's method				
10		Use of CRO to find voltage, frequency and phase.		-		
11		L & C by Equal Voltage Method				
12		Black Box- Identify & Measure R,L & C				
13		Anderson's Bridge to determine the self-inductance of the coil (L).				
14		Verification of Superposition Theorem				
15		Verification of maximum Power Transfer Theorem		-		
		Recommended Leaning Resources				
Referen	ce	1. Physics through experiments. B Saraf etc, - Vikas Publications(2013	3)			
Books		2. D P Khandelwal – A Laboratory Manual of Physics for Undergradu	late Classe	es, Vikas		
		Publications First ed (1985)				
		3. Advanced Practical Physics for Students – Workshop & Flint, Met	thuen & Co	э,		
		London.				
		4. An Advanced Course in Practical Physics, D Chattopadhyay, P C	Rakshit, B	Saha,		
	New Central Book Agency (P) Limited, Kolkata, Sixth Revised Edition, (2002)					
		5. B S C, Practical Physics, C L Arora, S Chand & Co, New Delhi, (2007) Revised Edition.				
		6. B.Sc. Practical Physics, Geeta Sanon R. Chand & Co. New Delhi F	Rani			
		Channam University, Belagavi, B.Sc.(CBCS) Physics Syllabus				

OPEN-ELECTIVESYLLABUS:

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Year	I	Course Code: 126BSC02PHYOEC02T	Credits	03		
Sem.	2	Course Title: Optical Instruments	Hours	40		
Forma	tive A	ssessment Marks:40 Summative Assessment Marks:60 Duration c	of ESA:.02h	ırs.		
Unit N	lo.	Course Content	Hou	rs		
		Basics of Optics				
		Scope of optics, optical path, laws of reflection and refraction as				
Unit I		per Fermat's principle, magnifying glass, Lenses (thick and				
Office		thin),convex and concave lenses, Lens makers formulae for double				
		concave and convex lenses, lens equation.				
			10			
		Focal and nodal points, focal length, image formation, combination	10			
L Init II		dispersion and dispersion power. Dispersion without deviation				
		(Expressions need not be derived, but have to be discussed				
		qualitatively).				
		Camera and microscopes				
		Human eye (constitution and working), Photographic camera				
		(principle, construction and working), construction, working and				
 Unit III		utilities of Simple microscopes, Compound microscope, Electron				
Onterin		microscopes, Binocular microscopes				
		Self-study	10			
		Experimental determination of magnifying power of a				
		diagrams)				
		Telescopes and Spectrometer				
		Construction, working and utilities of Astronomical telescopes				
		Terrestrial telescopes Reflecting telescopes, Construction, working				
		and utilities of Eyepieces or Oculars (Huygen, Ramsden's, Gauss)				
		Spectrometer Construction, working and utilities, measurement of	10			
Unit IV	,	refractive index.				
		Self-study				
		Telescopes used at different observatories in and outside India.				
		Hydropower resources, hydropower technologies, environmental				
		impact of hydro power sources.				
		Carbon captured technologies, cell, batteries, power consumption				

Activ	vities:
1)	Find position and size of the image in a magnifying glass and
	magnification.
2)	Observer a in bows and understand optics.
3)	Create a rainbow.
4)	Find out what makes a camera to be of good quality.
5)	Observe the dispersion of light through prism.
6)	Make a simple telescope using magnifying glass and lenses.
7)	Learn principle of refraction using prisms.
8)	Check bending of light in different substances and find out what
	matters here.
9)	Learn about different telescopes used to see galaxies and their
	ranges.
Μ	lany more activities can be tried to learn optics by going through
yo	bu tubes and website's such as
ht	.tps://spark.iop.org, <u>http://www.yenka.com,</u> https://publiclab.org
et	c.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

MATHEMATICS

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi , applicable from the

Academic Year 2023-24

PROGRAM STRUCTURE

Curricular and Credits Structure under Choice Based Credit System [CBCS] of Mathematics Major & One Minor Discipline Scheme for the Three Year/ Four Years Mathematics B.Sc. /B.Sc. Honors Programme with effect from2023-24.

SEMESTER-I										
Cate	Course	Title of the Paper	Marks			Teaching hours/week			Cred	Duration of exams
go ry	code			SE E	Total	L	Т	Р	it	(Hrs)
DSC1	126BSC01M ATDSC01T	Algebra - I and Calculus – I	40	60	100	4	-	-	4	2
	126BSC01M ATDSC01L	Theory based Practical's onAlgebra -I and Calculus – I	25	25	50	-	-	4	2	4
OEC1	126BSC01MA TOEC01T 126BSC01MA TOEC02T	Mathematics – I Business Mathematics – I	4 0	60	100	3		-	3	2

	SEMESTER-II																							
Categ ory	Course code	Title of the Paper	Mark	rks		Teaching hours/we ek		Teachin hours/v ek		Teaching hours/we ek		Teaching hours/we ek		Teaching hours/we ek		Teaching hours/we ek		Teaching hours/we ek		Teaching hours/we ek		Teaching hours/we ek		Duration of exams (Hrs)
			IA	SE E	Tot al	L	Τ	Р	it															
DSC 2	126BSC02 MATDSC02 T	Algebra - II and Calculus - II	40	60	10 0	4	_	-	4	2														
	126BSC02 MATDSC02 L	Theory based Practical's on Algebra- II and Calculus – II	25	25	50	-	-	4	2	4														
O EC 2	126BSC02M ATOEC03T 126BSC02M ATOEC04T	Mathematics – II Business Mathematics-II	40	60	10 0	3	_	_	3	2														

ASSESSMENT METHOD

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	30 marks
1 st Internal Assessment Test for 30 marks of duration 1 hr after	30
8 weeks and 2 nd Internal Assessment Test for 30 marks 1 hr	
after 15 weeks. Average of two tests should be considered.	
Assignment	10
Total	40
Assessment Criteria	25 marks
1 st Internal Assessment Test for 20 marks of duration 1/2 hr	20
	20
after 8 weeks and 2 nd Internal Assessment Test for 20 marks of	20
after 8 weeks and 2 nd Internal Assessment Test for 20 marks of duration 1 hr after 15 weeks. Average of two tests should be	20
after 8 weeks and 2 nd Internal Assessment Test for 20 marks of duration 1 hr after 15 weeks. Average of two tests should be considered.	20
after 8 weeks and 2 nd Internal Assessment Test for 20 marks of duration 1 hr after 15 weeks. Average of two tests should be considered. Assignment	05

Practical:

Assessment Criteria	25 marks
Semester End Internal Assessment Test for 20 marks of	20
duration 2 hrs	
Journal (Practical Record)	05
Total	25

Question Paper Pattern: Department of Mathematics

I Semester B.Sc (Mathematics) Code: MaximumMarks: 70

Sub:

- : Code: MaximumMa a. Answer any Six Questions from Question 1
- b. Answer any Three Questions from Question 2,3,4 and 5

Q.No.1.	Answer any Five Questions (Two question	2X6=12
	from Each Unit)	
	a.	
	b.	
	с.	
	d,	
	е.	
	f.	
	g.	
	h.	
Q.No.2.	(Should cover Entire Unit-I)	4X3=12
	a.	
	b.	
	С.	
	d.	
Q.No.3.	(Should cover Entire Unit-II)	4X3=12
	a.	
	b.	
	C.	
	d.	
Q.No.4.	(Should cover Entire Unit-III)	4X3=12
	a.	
	b.	
	С.	
	d.	
Q.No.5.	(Should cover Entire Unit-IV)	4X3=12
	a.	
	b.	
	C.	
	d.	

COURSE-WISE SYLLABUS

Semester I

Year	Ι	Course Code: 12		Credits	04		
Sem.	1	-			Hours	56	
		Course Title:	Algebra - I and Calculus – I				
Course	Pre-	requisites, if	NA				
Eormat	ivo /	Vesosemont	Summative Assessment Marks: 60	Duratio	n of ESA. ()2 hrc	
Marks:	40	155e55ment	Summative Assessment Marks: 60	Duratio	II 01 E5A(72 111 5.	
Course	9	This course	will enable the students to	I			
Outcomes•Learn to s•Solve the equations eigen valu•Sketch cu ••Sketch cu differenti•Identify a			Ive system of linear equations. ystem of homogeneous and non-homogeneous linear of m n n variables by using concept of rank of matrix, finding s and eigen vectors. ves in Cartesian, polar and pedal equations vill be familiar with the techniques of integration and tion of function with real variables. d apply the intermediate value theorems and L' Hospital				
Unit N	0.	Tute.	Course Content		Hours		
Unit I		Matrix: Recapi matrices, Cayle Cayley-Hamilto Matrices; Row a a matrix; Inve Solution of syst of non-trivial equations. Solu equations. Eige matrices, real sy reduction of su	1	4			
Unit II		Polar Co-ordinates: Polar coordinates, angle between the radius vector and tangent. Angle of intersection of two curves (polar forms), length of perpendicular from pole to the tangent, pedal equations. Derivative of an arc in Cartesian, parametric and polar forms, curvature of plane curve-radius of curvature formula in Cartesian, parametric and polar and pedal forms- center of curvature, asymptotes, evolutes and envelops.				4	
Unit III Unit III			Calculus-I: Limits, Cor y and properties. Properties of con rmediate value theorem, Rolle's Th ean Value theorem, Cauchy's Mea examples. Taylor's theorem, Mac minate forms and evaluation of limit	ntinuity, ntinuous eorem , n value claurin's cs using	1	4	

	L'Hospital rule.					
Unit IV	Successive Differentiation : nth Derivatives of Standard functions e^{ax+b} , $(ax + b)^m$, $\log(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, e^{ax} $\sin(bx + c)$, $e^{ax} \cos(bx+c)$, Leibnitz theorem and its applications. Tracing of curves (standard curves)	14				
Recommended Leaning Resources						
Print Resources	 References: 1. University Algebra - N.S. Gopala Krishnan, New Age Internate 2. Theory of Matrices - B S Vatsa, New Age International Publis 3. Matrices - A R Vasista, Krishna Prakashana Mandir. 4. Differential Calculus - Shanti Narayan, S. Chand & Company 5. Applications of Calculus, Debasish Sengupta, Books and Allie 6. Calculus - Lipman Bers, Holt, Rinehart & Winston. 7. Calculus - S Narayanan & T. K. Manicavachogam Pillay, S Ltd., vol. I & II. 8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mencular USA:Mc. Graw. 9. Text Book of B.Sc. Mathematics, G K Ranganath, S Chand 	tional (P) Limited shers. 7, New Delhi. d (P) Ltd., 2019. . Viswanathan Pvt. lelson, 5th ed. & Company.				

Year	Ι	Course Code	Course Code: 126BSC01MATDSC01L Credits 02						
Carro	т	Course Tit	le: Practical's on Algebra - I and	Harris	۲ <i>(</i>				
sem.	I	Calculus –	[Hours	50				
Course	e Pre-r	equisites, if	Knowledge of Programming						
any:									
Forma	tive As	ssessment	Summative Assessment Marks: 25	Duration	of ESA: 03				
Marks	: 25			hrs.					
Cours	e	This course	will enable the students to						
Outco	mes	Learn Fi	ree and Open Source Software (FOSS) to	ools for con	nputer				
		program	nming						
		Solve prob	olem on algebra and calculus theory s	studied in	MATDSCT 1.1				
		by using	g FOSS software.						
		Acquire kr	nowledge of applications of algebra and	d calculus t	hrough FOSS				
		Practical/	Lab Work to be performed in Comput	er Lab (FO	SS)				
		 Suggest 	ed		Software's:				
Maxima/Scilab/Maple/MatLab/Mathematica/Phython/R									
		Lab Practi	cal's:						
		Part A:			_				
		Introduction	n to the software and commands related to the topic.						
		1. Computa	tion of addition and subtraction of matrices,						
		2. Computa	ition of Multiplication of matrices.						
		3. Computat	tion of frace and franspose of Matrix						
		4. Computation of Kank of matrix and Kow reduced Echelon form.							
		5. Computation of inverse of a Matrix using Cayley-Hamilton theorem.							
		6. Solving	ig the system of homogeneous and non-homogeneous linear						
		algebraic eq	luations.						
		Part B.							
		7 Finding	the nth Derivative of eax trigon	ometric an	d hyperbolic				
		functions	the null Derivative of e , trigon		u nyperbone				
		8. Finding t	he nth Derivative of algebraic and loga	arithmic fu	nctions.				
9 Findin			the nth Derivative of $e^{ax+b} \sin(bx+c) = e^{ax+b} \cos(bx+c)$						
10 Fir			ng the Taylor's and Maclaurin's expansions of the given						
		functions.	S.						
		11. Finding	the angle between the radius vector a	nd tangent	-				
		12. Finding	the curvatures of the given curves.	0					
		13. Tracing of standard curves (Cartesian, polar and parametric)							

Evaluation Scheme for Lab Examination

Assessment Criteria	Marks	
Program – 1 from Part A	Writing Program	03
	Execution of Program	07
Program -2 from Part B	Writing Program	03
	Execution of Program	07
Viva-Voce	05	
Tot	25	

Semester II

Year	Ι	Course Code	Credits	04			
Sem.	II	Course 1it	Course Title: Algebra - II and Calculus –II				
Course if any	Pre-	requisites,	NA				
Formative Assessment Marks: 40			Summative Assessment Marks: 60	Duration of I	ESA:.02 hrs	5.	
Course Outcor	CourseThis course will enable the students toOutcomesRecognize the mathematical objects called Groups.• Link the fundamental concepts of groups and symme objects.• Explain the significance of the notions of Cosets, nor factor groups.• Understand the concept of differentiation and funda differentiation and various rules.					eometrical oups and eorems in	
Unit N	0.		Course Content		Hours		
Unit I		Real Number System: Recapitulation of number14system. Countable and uncountable sets, standard14theorems. Real line, bounded sets, suprimum and14infimum of a set, completeness properties of R,14Archimedean property of R. Intervals, neighborhood of14a point, open sets, closed sets, limit points and14					
Unit II		Groups: Deproperties, groups, ord theorems, or groups, Lag Fermat's the		14			
Partial Derivatives:Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables, Maxima-Minima of functions of two variables				vo or more ons, partial er's theorem, mplicit and d standard or's and riables, les		4	

Unit IV	Integral Calculus : Recapitulation of definite integrals and its properties. Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definitionof Double integrals and its conversion to iterated integrals. Evaluation of double integrals by changing the order of integration and change of variables. Computation of plane surface areas, volume	14		
	underneath a surface of revolution using double integral. Triple integral: Definition of triple integrals and evaluation-change of variables, volume as triple integral. Differentiation under the integral sign by Leibnitz rule.			
	Recommended Leaning Resources			
Print Resources	 References 1. Topics in Algebra, I N Herstein, Wiley Eastern Ltd., New Delhi. 2. Higher algebra, Bernard & Child, Arihant, ISBN: 9350943199/9789350943199. 3. Modern Algebra, Sharma and Vasista, Krishna Prakashan Mandir, Meerut, U.P. 4. Differential Calculus, Shanti Narayan, S. Chand & Company, New Delhi. 5. Integral Calculus, Shanti Narayan and P K Mittal, S. Chand and Co. Pvt.Ltd., 6. Schaum's Outline Series, Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc. Graw Hill., 2008. 7. Mathematical Analysis, S C Malik, Wiley Eastern. 8. A Course in Abstract Algebra, Vijay K Khanna and S K Bhambri, VikasPublications. 			

Year	Ι	Course Code	: 126BSC02MATDSC02L	_	Credits	02		
Sem.	II	Course Title: Practical's on Algebra - II and Calculus – II 56						
Course if any:	Pre-1	equisites,	Knowledge of Programming					
Format Marks:	ive A 25	ssessment	Summative Assessment Mar	·ks: 25	Duration of	of ESA: 03 hrs.		
Course	9	This course	will enable the students to					
Outcor	nes	• Learn Fi	ee and Open Source Software	ee and Open Source Software (FOSS) tools for computer				
		program	ming					
		Solve pr	oblem on algebra and calculus	s by using	FOSS softw	are's.		
		Acquire	knowledge of applications of	algebra ar	nd calculus	through FOSS		
		Practica	I/Lab Work to be performed	in Comput	er Lab			
		Suggested Maxima /Sci	ab/Maple/Matlab/Mathemati	ica /Dhytho	n /D	Software s:		
		I ab Practi			11/ IX.			
		Labilacti	Cal 5 .					
		Part A:						
		1. Progr	am for verification of binary o	perations.				
		2. Comp	utation of identity and invers	e elements	s of a group			
		3. Progr	am to construct Cayley's table	and test al	oelian for gi	ven finite		
		set.						
		4. Progr	am to find all possible cosets	of the give	n finite grou	ıp.		
		5. Progr cyclic	am to find generators and cor group.	rrespondin	g possible s	subgroups of a		
	6. Programs to verification of Lagrange's theorem with sui examples.			with suitable				
		Part B:						
		7. Prog	7. Program to verify the Euler's ϕ function for a given finite group.					
		8. Progr	am to verify the Euler's theor	em and its	extension			
		9. Prog	ams to construct series	using Ma	claurin's	expansion for		
			ions of two variables.			1		
		10. Progi limits	ani to evaluate the line integr	rais with C	onstant and	i variadie		
		11. Prog	am to evaluate the Double ir	ntegrals w	ith constan	t and variable		
		12 Drog	am to ovaluate the Triple in	tograle wi	th constant	t and variable		
		limit	S.	itegrais wi		allu valiable		

Evaluation Scheme for Lab Examination

Assessment Criteria	Marks	
Program – 1 from Part A Writing Program		03
	Execution of Program	07
Program -2 from Part B	Writing Program	03
	Execution of Program	07
Viva-Voce	05	
Tot	25	

OPEN-ELECTIVE SYLLABUS (Ist Semester):

A: For students of Science stream who have not chosen Mathematics as one of Core Subjects

Year	Ι	Course Code:	126BSC02MATOEC01T		Credits	03	
Sem.	Ι	Course Title: Mathematics – I Hou			Hours	42	
Course	Pre-	-requisites, if NA					
any							
Format	Formative Assessment Summative Assessment Duration of Duration			ESA:.02 h	rs.		
Course	40	This course will enable the students to					
Outcor	: nes	• Learn to	solve system of linear equation	ns			
outtor	nes	• Solvo th	o system of homogonoous a	nd non-hom	ogonooue	m linoar	
		• Solve th	e system of nonogeneous a	f matrix find	logeneous	aluos and	
		equation	tors	n matrix, mit	ing eigen v	alues allu	
		• Studente	will be familiar with the t	achniquae a	f difforon	tiation of	
		• Students	with real variables	echniques o	unieren	liation of	
		I Idontifu	and apply the intermediate y	value theore	me and l'	Hognital	
		• Identity	and apply the intermediate v	alue theore		поѕрна	
		Learn to	trace some standard curves.				
Unit N	0.		Course Content		Но	urs	
	-	Matrices: F	Recapitulation of Symmetric	and Skew	1	4	
		Symmetric m	atrices, Cayley- Hamilton theor	rem, inverse			
		of matrices	by Cayley-Hamilton theorem	n (Without			
		Proof). Algeb	ra of Matrices; Row and colum	n reduction,			
		Echelon form	n. Rank of a matrix; Inverse of	fa matrix by			
		elementary	operations; Solution of system	m of linear			
Unit I		equations; (
		solutions of homogeneous system of linear equations.					
		Solution of non-nomogeneous system offinear equations.					
		symmetric n					
		such matrices to diagonal					
		form.	o to alagonal				
		Differential	Calculus: Limits,	Continuity,	1	4	
		Differentiab	ility and properties. Intermedi	ate value			
Unit II		theorem, Ro					
omen		theorem, C					
		examples. Taylor's theorem, Maclaurin's series,					
		Indeterminat	Differentiation ath Der	instings of	1	4	
		Standard fu	Differentiation: nth Der	ivatives of	1	4	
Standard functions Unit III $ax+b (ax+b) = ba(ax+b) coc(ax+b)$							
onit II.	L.	$e^{ax} \sin(bx + a)$	(a_x, b_y) ,	rem and its			
		applications	. Tracing of curves (standard c	urves)			
	Recommended Leaning Resources						

Print			
Resources	References:		
neboureeb	1. University Algebra - N.S. Gopala Krishnan, New Age International (P)		
	Limited		
	2. Theory of Matrices - B S Vatsa, New Age International Publishers.		
	3. Matrices – A. R. Vasista, Krishna Prakashana Mandir.		
	4. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd.,		
	2019.		
	5. Differential Calculus - Shanti Narayan, S. Chand & Company, New		
	Delhi.		
	6. Calculus – Lipman Bers, Holt, Rinehart & Winston.		
	7. Calculus – S. Narayanan & T. K. Manicavachogam Pillay, S.		
	Viswanathan Pvt. Ltd.,vol. I & II.		
	8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th		
	ed. USA: Mc.Graw.		
	9. Text Book of B.Sc. Mathematics, G K Ranganath, S Chand & Company.		

B: For Students of other than Science Stream

Year	I Course Code: 126BSC02MATOEC02T			Credits	03	
Sem.	I Course T	`itle: Business Mathematics – I	ľ	Hours	42	
Course Pre-requisites, if any		NA				
Formative A Marks: 40	ssessment	Summative Assessment Marks: 60	Dur	ation of E	SA:.02 hrs	s.
Course	This course w	vill enable the students to				
Outcomes	 Translate the real word problems through appropriate mathematical modelling. Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety of context. Finding the extreme values of functions. Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business. 					
Unit No.	Course Content Hours					
Unit I	Algebra – Set theory and simple applications of Venn14Diagram, relations, functions, indices, logarithms, permutations and combinations. Examples on commercial mathematics.14					

	Matrices : Definition of a matrix; types of matrices;	14			
	algebra of matrices.				
	Properties of determinants; calculations of values of				
IInit II	determinants upto third order; Adjoint of a matrix,				
omen	elementary row and column operations; solution of a				
	system of linear equations having unique solutionand				
	involving not more than three variables.				
	Examples on commercial mathematics.				
	Differential Calculus : Constant and variables,	14			
	functions, Limits & continuity. Differentiability and				
	Differentiation, partial differentiation, rates as a				
	measure, maxima, minima, Partial Derivatives up to				
	second order; Homogeneity of functions and Euler's				
Unit III	Theorem; Total Differentials; Differentiation of				
	implicit function with the help of total				
	differentials, Maxima and Minima; cases of one				
	variable involving second or higher order derivatives;				
	Cases of two variables involving not more than one				
	constraint				
	Recommended Leaning Resources				

Print	
Resources	References:
neboureeb	1. Basic Mathematics, Allel R.G.A, Macmillan, New Delhi.
	2. Mathematics for Economics, Dowling, E.T. , Schaum's Series, McGraw
	Hill, London.
	3. Quantitative Techniques in Management, Vohra, N.D., Tata McGraw
	Hill, New Delhi.

OPEN-ELECTIVE SYLLABUS (II Semester) :

A: For students of Science stream who have not chosen Mathematics as oneof Core Subjects

Year	Ι	Course Code: 126BSC02MATOEC03T		Credits	03	
Sem.	II	- Course Title: Mathematics - II		Hours	42	
Course any	e Pre-r	re-requisites, if NA				
Forma Marks	tive As : 40	ssessment	Summative Assessment Marks: Duration of ESA:.02 ht			.02 hrs.
Cours Outco	se omes	 This course will enable the students to Recognize the mathematical objects called Groups. Link the fundamental concepts of groups and symmetries geometrical objects. Explain the significance of the notions of Cosets, normal subgroups and factor groups. Understand the concept of differentiation and fundamental theorem in differentiation and various rules. 				
		 Thu the option To under application 	erstand the concepts of multions.	ple in	s. tegrals a	nd their
Unit N	No.		Course Content		Но	urs
Unit I		Groups : Definition of a group with examples and properties, congruence, problems. Subgroups, center of groups, order of an element of a group and its related theorems, cyclic groups, Coset decomposition, Factor groups, Lagrange's theorem and its consequences. Fermat's theorem and Euler's ϕ 14				4
Unit I	I	Partial Derivatives: Functions of two or more14variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard 			4	
Unit I	II	Integral Ca integrals and line integral evaluation of of Double in integrals. Ev the order of Computation underneath	Calculus:Recapitulationofdefinite14nd its properties. Line integral: Definition of gral and basic properties, examples on of line integrals. Double integral: Definition integrals and its conversion to iterated Evaluation of double integrals by changing of integration and change of variables. on of plane surface areas, volume h a surface of revolution using14			

	double integral. Triple integral: Definition of triple				
	integrals and evaluation-change of variables, volume				
	as triple integral. Differentiation under the integral				
	sign by Leibnitz rule.				
	Recommended Leaning Resources				
Print					
Resources	References:				
	1. Topics in Algebra, I N Herstein, 2nd Edition, Wiley	Eastern Ltd., New			
	Delhi.				
	2. Higher algebra, Bernard & Child, Arihant Pub.				
	3. Modern Algebra, Sharma and Vasishta, Krishna Pra	kashan Mandir,			
	Meerut, U.P.				
	4. A Course in Abstract Algebra, Vijay K Khanna and S	S K Bhambri, Vikas			
	Publications.				
	5. Differential Calculus, Shanti Narayan, S. Chand	& Company, New			
	Delhi.	1 57			
	6. Integral Calculus, Shanti Narayan and P K Mittal	, S. Chand and Co.			
	Pvt. Ltd.,				
	7. Schaum's Outline Series, Frank Ayres and Elliott	Mendelson, 5th ed.			
	USA: McGraw Hill., 2008.	,			
	8. Mathematical Analysis, S C Malik, Wiley Eastern.				
	9. Text Book of B.Sc. Mathematics, G K Ranganath, S C	hand & Company.			

B: For Students of other than Science Stream

Year	Ι	Course Co	de: 126BSC02MATOEC04T		Credits	03
Sem.	II	Course Title: Business Mathematics – II			Hours	42
Course F if any	re-re	quisites,	NA			
Formati Marks: 4	ve Ass 40	sessment	Summative Assessment Marks: 60	Duration	of ESA:.02	2 hrs.
 Course This course will enable the students to Integrate concept in international bust functioning of global trade. Evaluate the legal, social and economic environ Apply decision-support tools to business decisi Will be able to apply knowledge of business continues of the support of the support for the			nal busin ic environ ess decisio isiness con	ness cono ment of bu on making. ncepts and	cept with isiness. functions	
Unit No).		Course Content		Ho	ours
Unit I		Commer Present v Compour of intere Ordinary Present Equated of Reduct Balance and Prob	ercial Arithmetic: Interest: Concept of value and Future value, Simple interest, und interest, Nominal and Effective rate rest, Examples and Problems Annuity: ry Annuity, Sinking Fund, Annuity due, to Value and Future Value of Annuity, d Monthly Instalments (EMI) by Interest acing e and Flat Interest methods, Examples oblems.14			14
Unit II		Measures of central Tendency and Dispersion: Frequency distribution: Raw data, attributes and variables, Classification of data, frequency distribution, cumulative frequency distribution, Histogram and give curves. Requisites of ideal measures of central tendency, Arithmetic Mean, Median and Mode for ungrouped and grouped data. Combined mean, Merits and demerits of measures of central tendency, Geometric mean: definition, merits and demerits, Harmonic mean: definition, merits and demerits, Choice of A.M., G.M. and H.M. Concept of dispersion, Measures of dispersion: Range, Variance, Standard deviation (SD) for grouped and ungrouped data, combined SD, Measures of relative dispersion: Coefficient of range, coefficient of variation.				14
Unit III		Correlation and regression: Concept and14types of correlation, Scatter diagram,				14

	Interpretation with respect to magnitude and direction of relationship. Karl Pearson'scoefficient of correlation for ungrouped data. Spearman's rank correlation coefficient. (with tie and without tie) Concept of regression, Lines of regression for ungrouped data predictions using lines of regression
	Regression coefficients and their properties (without proof). Examples and problems.
	Recommended Leaning Resources
Resources	 References: 1. Practical Business Mathematics, S. A. Bari New Literature Publishing Company New Delhi. 2. Mathematics for Commerce, K. Selvakumar Notion Press Chennai 3. Business Mathematics with Applications, Dinesh Khattar & S. R. Arora S. Chand Publishing New Delhi 4. Business Mathematics and Statistics, N.G. Das &Dr. J.K. Das McGraw Hill New Delhi 5. Fundamentals of Business Mathematics, M. K. Bhowal, Asian Books Pvt. Ltd New Delhi 6. Mathematics for Economics and Finance: Methods and Modelling, Martin Anthony and Norman, Biggs Cambridge University Press Cambridge 7. Financial Mathematics and its Applications, Ahmad Nazri Wahidudin Ventus Publishing APS Denmark 8. Fundamentals of Mathematical Statistics, Gupta S. C. and Kapoor V. K.; Sultan Chand and Sons, New Delhi. 9. Statistical Methods, Gupta S. P.: Sultan Chand and Sons, New Delhi. 10. Applied Statistics, Mukhopadhya Parimal New Central Book Agency Pvt. Ltd. Calcutta.
	 Fundamentals of Statistics, Goon A. M., Gupta, M. K. and Dasgupta, B. World Press Calcutta. Fundamentals of Applied Statistics, Gupta S. C. and Kapoor V. K.:, Sultan Chand and Sons, New Delhi.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

BOTANY

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted From RCU Belagavi Applicable

from the

Academic Year 2023-24

Curricular and Credits Structure under Choice Based Credit System [CBCS] of Botany Major& One Minor Discipline Scheme for the Three Years/Four Years B.Sc./B.Sc. (Honors)Programme with effect from 2023-24

SEMESTER-I										
Categor y	Course code	Title of the Paper	Mark s			Teaching hours/ week			Credit	Durat ion of exams (Hrs)
			IA	SE E	Total	L	Т	Р		(1115)
DSC1	126BSC01BOTDSC01 T	Microbial Diversity and technology	40	60	100	4	-	-	4	2
	126BSC01BOTDSC01L	Microbial Diversity and technology	25	25	50	-	-	4	2	4
OEC1	126BSC01BOTOEC 01T	Plants and Human welfare	40	60	100	3		-	3	2

SEMESTER -II										
Catego ry	Course code	Marks			Teachin g hours/we ek			Credit	Duratio n of exams(
			IA	S	To	L	Т	Р		nis)
				E E	ι al					
DSC2	126BSC02BOTDSC02T	Diversity of Non flowering plants	40	60	10 0	4	-	-	4	2
	126BSC02BOTDSC02L	Diversity of Non flowering plants	25	25	50	-	-	4	2	4
OEC2	126BSC02BOTOEC 02T	Bio-fuels	40	60	10 0	3	-	-	3	2

ASSESSMENT METHODS

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and	30
2 nd Internal Assessment Test for 30 marks 1hr after 15weeks .Average	
of two tests should be considered.	
Assignment	10
	10
Total	40

Assessment Criteria	25marks
1 st Internal Assessment Test for 20 marks 1 hr after 8weeks and 2 nd	20
Internal Assessment Test for 20marks 1 hr after 15weeks. Average of	
two tests should be considered.	
Assignment	05
Total	25

Practical:

Assessment Criteria	25marks
Semester End Internal Assessment Test for 20 marks 2hrs	20
Journal (Practical Record)	05
Total	25

Question Paper Pattern:

BAGALKOT UNIVERSITY, JAMKHANDI

	BSc (botany)	
	Sub: Code: Maximum M	larks: 60
	a. Answer any Six Questions from Question 1	
	b. Answer any Three each Questions from Question 2,3	,4 and 5
Q.No.1.	Answer any Six Questions (Atlest Two question from Each Unit)	2X6=12
	a.	
	b.	
	с.	
	d,	
	е.	
	f.	
	g.	
	h.	
Q.No.2.	(Should cover Entire Unit- I)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.3.	(Should cover Entire Unit-II)	4X3=12
	a.	
	b.	
O No 4	U. (Chauld cover Entire Linit III)	4V2-12
Q.N0.4.	(Should cover Entire Unit-III)	4A3=12
	d.	
	d	
0 No 5	(Should cover Entire Unit-IV)	4X3-12
Q.110.5.	a.	1713-12
	b.	
	C.	
	d.	

COURSE-WISE SYLLABUS

Semester I

Year	Ι	Course Code: 126BSC	01BOTDSC01T		Credits	04		
Sem.	1	- Course Title: Microl	bial diversity and Technology		Hours	52		
Course	Pre-re	equisites, if any	NA	I				
Format	ive As	sessment Marks: 40	Summative Assessment Marks: 60 Duration of ESA: 2hrs					
Course	9	1. Unders	stand the fascinating diversity, evolution, an	d significa	nce of			
Outcomes		microo	organisms.					
2. Comprehend the systematic position, s microbes and their impact on humans			whend the systematic position, structure, phy bes and their impact on humans and environ	ysiology an ment.	nd lifecycl	es of		
		3. Gain la	aboratory skills such as microscopy, microb	1al cultures	s, staining,	, 1		
		identifi	ication, preservation of microbes for their ap	plications	in researc	h and		
		industr	У					
Unit N	0.		Course Content		Ho	mrs		
		Chapter No. 1: M	licrobial diversity-Introduction to microb	bial divers	ity;			
		Hierarchical organization and positions of microbes in the living world.						
		Whittaker's five-kingdom system. Distribution of microbes in soil, air, food						
		and water. Significan	nce of microbial diversity in nature.	5Hours				
Unit-I Chapter No. 2: History and developments of microbiology and their contributions (Leeuwenhoek, Louis Pasteur, Robe Lister, Dmitri I wanowski, Sergius Winogradsky and M W Be Ehrlich).			tory and developments of microbiology-Mons (Leeuwenhoek, Louis Pasteur, Robert wski, Sergius Winogradsky and M W Beijer 3Ho	licrobiolog Koch, Jos rinck and F ours	jists eph Paul			
					1	13		
		Chapter No. 3: Micr dark field, phase com Microbiological stair staining. Simple, Gra	roscopy-Working principle and applications trast and electron microscopes (SEM and The as (acidic, basic and special) and Principles m's and differential staining.	of light, EM). of Hours				
Unit-II	[Chapter No. 4: Cu Routine media - basa transport media, and Chapter No. 5: Steri tyndallisation and Pa heat, UV light, ioniza sterilization-phenol c Chapter No. 6. Mic Nutritional types of I chemotrophs;	Iture media for Microbes-Natural and syrI media, enriched media, selective media, in storage media.3Hourslization methods-Principle of disinfection, a steurization, Sterilization-Sterilization by dration radiation, filtration. Chemical method compounds, anionic and cationic detergents. robial Growth-Microbial growth and meas Microbes- autotrophs and heterotrophs, pho- lithotrophshttps://doi.org/10.1016/j.ation.com	antiseptic, ry heat, mo s of 5Hours ototrophs a 5Hours	dia, dia, oist 1 und	13		
	Chapter No. 7: Microbial cultures and preservation- Microbial cultures. Pure culture and axenic cultures, sub culturing, Preservation methods-overlaying cultures with mineral oils, lyophilisation. Microbial culture. Collections and	13						
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Unit III	their importance. A brief account on ITCC, MTCC and ATCC. Shours Chapter No .8: Viruses- General structure and classification of Viruses; ICTV system of classification. Structure and multiplication of TMV,SARS- COV-2, and Bacteriophage (T2). Cultive ation of viruses. Vaccines and types. 5 Hours							
	Chapter No.9: Viroids- general characteristics and structure of Potato Spindle Tuber Viroid (PSTVd); Prions - general characters and Prion diseases. Economic importance of viruses. 3Hours							
	Chapter No. 10: Bacteria- General characteristics and classification.	13						
	Archaebacteria and Eubacteria. Ultrastructure of Bacteria; Bacterial growth							
	and nutrition. Reproduction in bacteria- asexual and sexual methods. Study of							
	Rhizobium and its applications. A brief account of Actinomycetes and							
	discasses Economic importance of Pactoria							
	diseases. Economic importance of Bacteria.							
Unit IV	Chapter No. 11: Fungi-General characteristics and classification							
	Thallus organization and nutrition in fungi. Reproduction in fungi							
	(asexualandsexual). Heterothallism and parasexuality.							
	Typestudyof <i>Phytophthora</i> , <i>Rhizopus</i> ,, <i>Puccinia</i> , <i>Penicillium</i> . 5Hours							
	Chapter No. 12: Lichens– Structure and reproduction. VAM Fungi and their							
	significance. Fungal diseases Black stem rust of wheat; Downy Mildew of							
	Bajra, Grain smut of Sorghum, Citrus Canker, Economic importance of Fungi.							
	3Hours							

Recommended Leaning Resources

Print	Text Books
Resources	1. Ananthnarayan Rand PanikarJCK.1986.Textbook of Microbiology.
	Orient Longmanltd. NewDelhi.
	2. Arora DR.2004. Textbook of Microbiology, CBS, New Delhi.
	3. William CG. 1989. Understanding
	microbes. A laboratory text
	Book for Microbiology. W.H.Freeman and Company. New York.
	4. Dubey R Cand Maheshwari DK.2007. A text book of Microbiology,
	S.Chandand Company, NewDelhi.
	5. Dubey R Cand Maheshwari DK.2002. A Textbook of Microbiology,
	S.C.Chandand Company, Ltd. Ramnagar, NewDelhi.
	6. SharmaR.2006.Text book of Microbiology. Mittal Publications. New
	Delhi.305pp.
	 Sharma PD. 1999. Microbiology and Plant Pathology. Rastogi publications. Meerut, India
	 Vasanthkumari R. 2007. A text book of Microbiology, BI PublicationsPvt.Ltd. New Delhi

References	1 Alexenoulos C Iand Mims CW 1989 Introductory Mycology
	1. Alexepoulos C Jand Willis C W. 1969. Introductory Wrycology,
	Wiley Eastern Ltd., New Delhi.
	2. Allas RM.1988.Microbiology: Fundamentals and
	Applications, Macmillan publishing co. New York.
	3. Brook TD, Smith DW and Madigan MT. 1984. Biology of
	Microorganisms, 4 th ed. Eaglewood Cliffts .N.J.Prentice-Hall. New
	Delhi.
	4. Burnell JH and Trinci APJ. 1979. Fung alwalls and hyphal
	growth, Cambridge University Press. Cambridge.
	5. Michel J, Pelczar Jr.EC and Krieg CR. 2005. Microbiology, Mc.
	Graw- Hill, New Delhi.
	6. Powar C B and Daginawala. 1991. General Microbiology, Vol–IandVol
	–II Himalaya publishing house, Bombay.
	7. ReddyS and Ram.2007. Microbial Physiology. Scientific
	Publishers, Jodhpur, 385pp.
	8. Sullia S B and Shantharam S.1998.General Microbiology.
	Oxford and IBH publishing Co. P. Ltd. New Delhi

Year	Ι	Course Code: 126BSC01	Course Code: 126BSC01BOTDSC01L		Credits	02	
Sem.	Ι	Course Title: Microbial	diversity and Technology		Hours	45	
Course	e Pre	-requisites, if any:	NA				
Forma	Formative Assessment Marks: 25Summative Assessment Marks: 25Duration			n of ESA: 0	3 hrs.		
		- Practical 1: Safety mea	sures in microbiology laboratory and stud	dy of equ	ipment/app	liances	
		used for microbiologica	l studies (Microscopes, Hot air oven, A	Autoclave	e/Pressure C	Cooker,	
		Inoculation needles/loop	p, Petri plates, Incubator, Laminar flo	w hood,	Colony c	ounter,	
		Haemocytomer, Microm	eter etc.).				
		Practical 2: Enumeration	n of soil/food /seed microorganisms by ser	rial dilutio	on technique	2.	
		Practical 3: Preparation	of culture media (NA/PDA) sterilization, i	noculatio	on, incubatio	on of E	
		coli / B. subtilis/ Fungi a	nd study of cultural characteristics.				
		Practical 4: Determina	tion of cell count by using Hemocytom	eter and	determinat	ion of	
		microbial cell dimension	by using Micrometer.				
		Practical 6: Simple stain	ning of bacteria (Crystal violet /Nigrosine	blue) / C	Gram's stain	ing of	
		bacteria.					
		Practical 7: Isolation an	d study of morphology of Rhizobium fron	n root noo	lules of legu	imes	
		Practical 8: Preparation	of spawn and cultivation of paddy straw (Oyster) n	nushroom.		
		Practical 9: Study	of vegetative structures and re	eproducti	ve structu	res -	
		Albugo,Phytophthora/Py	thium, Rhizopus/Mucor, Saccharomyc	es, Pi	accinia, Ag	aricus.	
		Lycoperdon, Aspergillus	/Penicillium.				
		Dractical 10. Dracest	ion of agon alanta incordation in wh	ation -		a and	
		preservation of microbes	by oil overlaying.	ation, p		ig and	
	Practical 11: Downy mildew of Bajra/Maize/Sorghum, Citrus canker, Tobacco mosaic						
		disease.					
		Practical 12: Study of well-known microbiologists and their contributions through charts and					
		photographs.					
		Practical-13: Visit to wa	ater purification units/Composting/ microl	biology la	bs/dairy and	l farms	
		to understand role of mic	crobes in day today life.				

(Note: Visit to Composting/ microbiology labs/dairy and farms to understand role of microbes in day today life and submission of study report is compulsory)

Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course

Evaluation Scheme for Lab Examination

Assessment Criteria	Marks	
Preparation Gram staining		05
Enumeration	05	
Identification	05	
Comment		05
Viva Voice /Tour report	05	
Tota	al	25

OPEN-ELECTIVE SYLLABUS :

Year	Ι	Course Code: 126BSC01BOTOEC01T				03
Sem.	II	Course little: PLANI	Hours	40		
Course	Pre-re	equisites, if any	NA			
Format	ive As	ssessment Marks: 40	Summative Assessment Marks: 60	Duration of	f ESA:.02 l	hrs.
Course	e	At the end of the cours	e the student should be able to:			
Outcor	 Outcomes To make the students familiar with economic importance of diverse plants that offer resourcesto human life. To make the students known about the plants used as-food, medicinal value and also plantsource of different economic value. To generate interest amongst the students on plants importance in day today life, conservation, ecosystem and sustainability. 					
Unit N	0.		Course Content		Hour	S
Unit I		Origin of Cultivated importance with refer introductions. Crop of conventional plant breand and conservation. Cereals : Wheat and	A Plants. Concept of Centres of Or rence to Vavilov's work. Examples of n lomestication and loss of genetic diver eeding methods). Importance of plant bio Rice (origin, evolution, morphology, po	igin, their najor plant sity (Only o- diversity ost-harvest	10	

	processing & uses).Green revolution. Brief account of millets and their nutritional importance.	
Unit II	 Legumes: General account (including chief pulses grown in Karnatakared gram, green gram, chick pea, soybean). Importance to man and ecosystem. Cash crops: Morphology, new varieties and processing of sugarcane, products and by- products of sugarcane industry. Natural Rubber – cultivation, tapping and processing. 	10
Unit III	 Spices: Listing of important spices, their family and parts used, economic importance with special reference to Karnataka. Study of fennel, clove, black pepper and cardamom. Fruits: Mango, grapes and Citrus (Origin, morphology, cultivation ,processing and uses) 	10
Unit IV	Oils and fats: General description, classification, extraction, their uses and health implications; groundnut, coconut, sunflower and mustered (Botanical name, family & uses). Non edible oil yielding trees and importance as biofuel. Neem oil and applications. Beverages: Tea, Coffee (morphology, processing&uses)	10
	Recommended Leaning Resources	
Print Resources	 Text Books: 1. Kochhar, S.L. (2012). Economic Botany in Tropics. MacMillan & Delhi. 2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Netherlands:Kluwer Academic Publishers. Netherland. 3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agrid & Bartlett- Publishers. Lincoln, United Kingdom 	c Co. New . The culture. Jones

Semester: II

Cou	rse code :126BSC02BOTDSC02L	Title :Diversity of Non flov	vering Plants		
ative	Assessment Marks: 40	Summative Assessment Ma	arks: 60	Duration of ESA: 0	13
se	A ftor completing this course	satisfactorily a student will I	a abla to:		
om es	1. Understand the div Gymnosperms.	ersity and affinities among Al	gae, Bryophytes, Pte	eridophytes and	
	2. Understand the mo Bryophytes,Pterido	orphology, anatomy, reproduc	tion and life cycle ad	cross Algae, nd evolutionary	
	significance.		U	-	
No.	3. Obtain laboratory s	skills/explore non-flowering p Course Content	lants for their comm	ercial applications.	Ho
	Chapter No. 1 Algae –Introduct classification of algae, Diversity life-cycle and alternation of gen 5Hours	tion and historical developmen - habitat, thallus organization eration in Algae. Distribution	nt in algology. Gener , pigments, reserve f of Algae.	ral characteristics and food, flagella types,	13
Ι	Chapter No. 2 Morphology and <i>Ectocarpus and Batrachospermi</i> Algal blooms and toxins.	l reproduction and life-cycles <i>um</i> . Diatoms and their importa	of Nostoc, <i>Oedogon</i> ince. Blue-green alga 5Ho	<i>ium, Spirogyra,</i> ae-A general account. ours	
	Chapter No. 3 Algal cultivation Algal products- Food and Nut therapeutics and cosmetics; med	- Cultivation of microalgae-Sp raceuticals, Feed stocks, foo licines; dietary fibres from alg	<i>pirulina</i> ;Algal cultiva d colorants; fertilize gae and uses.	tion methods in India. ers, aquaculture feed;	
				3 Hours	
	Chapter No. 4. Bryophytes – Ge	eneral characteristics and class	ification of Bryophyt	es, Diversity-habitat,	13
	thallus structure, Gametophytes	and sporophytes.		5 Hours	
	Chapter No. 5 Distribution,	, morphology, anatomy, re	production and lif	e-cycles of <i>Riccia</i> ,	
II	Anthoceros, and Funaria. Ecolog	gical and economic importanc	e of Bryophytes. For	ssil Bryophytes.	
				3 Hours	
	Chapter No. 6 Pteridophyte and life-cycles. Distribution, Selaginella, Equisetum, Pteris.	es- General characteristics and morphology, anatomy, repr	d classification; Stru coduction and life-	cture of sporophytes cycles in Psilotum, 5Hours	

	Chapter No. 7 A brief account of heterospory and seed habit. Stelar evolution in Pteridophytes. ¹³
	Aminities and evolutionary significance of Pteridophytes. Ecological and economic importance.
III	5Hours
	Chapter No. 8. Gymnosperms- General characteristics. Distribution and classification of
	Gymnosperms. Study of the habitat, distribution, habit, anatomy, reproduction and life-cycles in Cycas,
	Pinus andGnetum. 5 Hours
	Chapter No. 9. Affinities and evolutionary significance of Gymnosperms. Economic importance of Gymnosperms - food, timber, industrial uses and medicines.3 Hours
it IV	Chapter No. 10. Origin and evolution of Plants: Origin and evolution of plants through Geological ¹³
	Time scale.2 Hours
	Chapter No. 11. Paleobotany- Paleobotanical records, plant fossils, Preservation of plant fossils -
	impressions, compressions, petrification's, moulds and casts, pith casts. Radiocarbon dating.
	6 Hours
	Chapter No. 12. Fossil taxa- <i>Rhynia, Lepidodendron,Lyginopteri</i> Exploration of fossil fuels. BirbalSahni Institute of Paleosciences. 5 Hours
	Recommended Leaning Resources
	Text Books:
	Text Books
	1) Chopra, G.L. Atextbook of Algae. Rastogi & Co., Meerut, Co., New Delhi, Depot.
	Allahabad.
	2) Johri, LataanfTyagi, 2012, A Text Book of, Vedam e Books, NewDelhi.
	3) Sharma, O.P. 1990. Text Book of Pteridophyta. McMillan India Ltd. NewDelhi.
	4) Sharma, O.P. 1992. Text Book of Thallophytes. McGraw Hill Publishing Co. New Delhi.
	5) Sharma, O.P., 2017, AlgaeSingh-Pande-Jain2004-05. A Text Book ofBotany.
	Rastogi Publication, Meerut.
	References
	1. Sambamurty, A.V.S.S A Text Book of Algae. I.K. International Private Ltd., New Delhi.
	Page 30 of 33

- 2. Agashe, S.N. 1995. Paleobotany. Plants of the past, their evolution, paleoenvironment and Allieplants. Hutchinson & Co., Ltd., London.
- 3. Anderson R.A. 2005, Algal cultural Techniques, Elsievier, London.
- 4. Publication, Application in exploration of fossil fuels. Oxford & IBH., New Delhi.
- 5. Eams, A.J., (1974) Morphology of vascular plants Lower groups. Tata Mc Grew- Hill Publishing CoDelhi, Freeman & Co., New York.
- 6. Fritze, R.E. 1977. Structure and reproduction of Algae. Cambridge University Press.
- 7. Goffinet B and Shaw A.J. 2009, Bryophyte Biology, 2nd ed. Cambridge Unver

Cambridge.Gymnosperms.

- 8. Srivastava, H N, 2003. Algae Pradeep Publication, Jalandhar, India.
- 9. Kakkar, R.K. and B.R.Kakkar(1995) The Gymnosperms (Fossils and Living) Central Publishing Hou Allahabad.
- 10. Kumar H. D., 1999, Introductory Phycology, Affiliated East-West Press, Delhi.
- 11. Lee, R.E., 2008, Phycology, Cambridge Unversity Press, Cambridge. 4th edition.McGraw Hill Publis Co., New Delhi.
- 12. Parihar, N.S. 1970. An Introduction to Embryophyta. Vol. I. Bryophyta. Central Book, Allhabad.
- 13. Parihar, N.S. (1976) An Introduction to Pteridophytes, Central Book Depot, Allhabad.
- 14. Parihar, N.S. 1977. The Morphology of Pteridophytes. Central Book Depot., Allahabad.Press, Cambridge.
- 15. Rashid, A. 1998. An Introduction to Pteridophyta. II ed., Vikas Publishing House, New D
- 16. Smith, G.M. 1971. Cryptogamic Botany. Vol. II. Bryophytes & Pteridophytes. Tata Tata McGraw Hill Publishing, New Delhi.
- 17. Smith, G.M. 1971. CryptogamicBotny. Vol.I Algae & Fungi. Tata McGraw Hill Publishing. New Del
- 18. Sporne, K.R. 1965. The Morphology of Gymnosperms. Hutchinson & Co., Ltd., London.
- 19. Stewart, W.M. 1983. Paleobotany and the Evolution of Plants, Cambridge

UniversityCambridge.

I	I Course Code: 126BSC02BOTDSC02L			Credits		02
2	2 Course Title: Diversity of Non flowering plants			Hours		45
se Pre-	requisites, if any:	NA	•			
ative A	Assessment Marks: 25	Summative Assessment Marks: 25	Dura	tion of E	SA: 03 hrs.	,
	Practical-1: Study of Nostoc, Oscillatoria. Practical-2: Study of more	morphology, classification, reproduct	tion a	nd life	ecycle	of
 Practical-2: Study of morphology, classification, reproduction and life-cycle of Riccia&Anthoceros/ Funaria. Practical-4: Study of morphology, classification, anatomy, reproduction and life-cycle of Selaginella and Equisetum. 						of
	Practical -5 : Study of mor Pteris, Azolla/.Psilotum	phology, classification, anatomy, reproduc	tion an	d life-cyc	le of	

Practical -6: Study of morphology, classification, anatomy and reproduction in Cycas. Practical -7: Study of morphology, classification & anatomy, reproduction in Pinus. Practical -8: Study of morphology, classification & anatomy, reproduction in Gnetum.

Practical -9: Study of important blue green algae causing water blooms in the lakes.

Practical -10: Preparation of natural media and cultivation of Azolla in artificial ponds.

Practical -11: Study different algal products and fossils impressions and slides.

Practical-12: Visit to algal cultivation units/lakes with algal blooms/Fern house/ Nurseries/Geology museum/lab to study plant fossils.

(Note: Botanical study tour to a floristic rich area for 1-2 days and submission of study report is compulsory)

Evaluation Scheme for Lab Examination

Assessment Criteria	Marks
Classification and	10
description	
T.S. of given material	05
Identification	05
Viva Voice /Tour report	05
Total	25

OPEN-ELECTIVE SYLLABUS:

Year	Ι	Course Code: 126BSCO2BOTOEC02T			Credits	03
Sem.	II	Course Title: Bio-fuels			Hours	40
Course	Pre-re	equisites, if any	NA			
Format	tive As	ssessment Marks: 40	Summative Assessment Marks: 60	Duration of	f ESA:.02	hrs.
Course	e	At the end of the cours	e the student should be able to:			
Outco	mes	 To make the commercial e To make the industries an To generate fuel in day to 1. 	students familiar with Bio-fuel plant speexploitation. students known about the Bio-fuel use d solving fuel problems in feature. interest amongst the students to know the oday life and economic wellbeing.	ecies cultiva d in automo ne importanc	tion for bile ce of Bio-	

Unit No.	Course Content	Hours
Unit I	Introduction, definition, scope and Importance of Bio-fuel with respect to climate change and environmental issues. Public awareness. Biofuels scenario in India and world. History of Biofuels. Advantages and disadvantages of biofuels. Developmental generation of biofuels: first, second, third and fourth generation of biofuels and present status.	10
Unit II	Biofuel feed stocks: Agricultural waste, farm waste, forestry waste, organic wastes from the residential, institutional and industrial waste and its importance.(Biomass- plant, animal and microbial based waste).Algal biofuel.	10
Unit III	Biodiesel species: <i>Pongamia pinnata, Simarouba gluca, Jatropha curcas, Azardirachta india, Madhuca indica</i> and <i>Callophyllum innophyllum</i> . Seed harvesting, processing, oil extraction, and characterization.	10
Unit IV	Introduction to biodiesel, bioethanol, biogas and bio hydrogen. Production technology of biofuels (Biodiesel, ehanol and biogas). Quality analysis of biodiesel, bioethanol and biogas and its comparison with national and international standards. Biofuel sustainability; Biofuel Policy in Karnataka and India. Biofuel production statistics. Fuel against food security concepts.	10
	Recommended Leaning Resources	
Print Resources	Text Books and References	
	 The Biodiesel Handbook (2005). Jurgen Krahl, Jon Harlan Van Ge Press. 	erpen.AOCS
	 Bioenergy and Biofuels (2017).Ozcan Konur. CRC Press, Taylor or group. 	& Franci's
	3) <u>https://mnre.gov.in/biofuels</u>	
	1.	



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

ZOOLOGY

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted From RCU Belagavi applicable from the

Academic Year 2023-24

Zoology

Credits Structure under Choice Based Credit System [CBCS] Zoology Major& One Minor Discipline Scheme for the Three years/ Four Years B.Sc./B.Sc.(Honors) Program with effect from 2023-24.

SEMESTER-I										
Category	Course code	Title of thePaper	Marks		Marks Teaching hours/wee k			Cre dits	Duration of exams(Hrs)	
			IA	SE E	Tot al	L	Τ	Р		
DSC1	126BSC01ZOODS C01T	Cytology, Genetics and Infectious Diseases	40	60	100	4	-	-	4	2
	126BSC02ZOODS C01L	Cell Biology and Genetics	25	25	50	-	-	4	2	4
OEC1	126BSC01ZOOOE C01T	Economic Zoology	40	60	100	3	-	-	3	2

SEMESTER-II												
Catego ry	Course code	Title of the Paper	Marks		Marks		Marks		Teaching hours/wee k		Cred its	Duration of exams(Hrs.)
			IA	SE E	Tot al	L	Т	Р				
DSC2	126BSC02ZOOD SC02T	Biochemistry and Physiology	40	60	100	4	-	-	4	2		
	126BSC02ZOO DSC02L	Physiological, Biochemical & Hematology	25	25	50	-	-	4	2	4		
OEC2	126BSC02ZOO OEC02T	Parasitology	40	60	100	3	-	-	3	2		

Syllabus for I Semester

Year	Ι	Course Code: 126BSC01ZOODSC01T	Credits	04
Sem.	1	Course Title: Cytology, Genetics and Infectious Diseases	Hours	56
Sem.	1	Sourse The Sytology, Scheres and Infectious Discuses	nours	50
Unit No.		Course Content	Hour	S
		 Structure and Function of Cell Organelles I in Animal cell Plasma membrane: chemical structure—lipids and proteins 	14	
Unit I		 Endomemorane system: protein targeting and sorting, transport, endocytosis and exocytosis Structure and Function of Cell Organelles II in Animal Cell Cytoskeleton: microtubules, microfilaments, intermediate filaments 		
		 Mitochondria: Structure, oxidative phosphorylation; electron transport system Peroxisome and Ribosome: structure and function 		
Unit II	[Nucleus and Chromatin Structure Structure and function of nucleus in eukaryotes Chemical structure and base composition of DNA and RNA Structure of chromosomes Types of DNA and RNA Cell cycle, Cell Division and Cell Signaling Cell division: mitosis and meiosis Introduction to Cell cycle and its regulation, apoptosis Signal transduction: intracellular 11 signaling and cell surface receptors, via G-protein linked receptors Cell-cell interaction: cell adhesion molecules, cellular junctions 	14	
Unit II	I	 Mendelism and Sex Determination Basic principles of heredity: Mendel 's laws- monohybrid cross and hybrid cross Complete and Incomplete Dominance Genetic Sex-Determining Systems, Environmental Sex Determination, Sex Determination and mechanism in <i>Drosophila melanogaster</i>. Sex-linked characteristics in humans and dosage compensation Extensions of Mendelism, Genes and Environment Extensions of Mendelism: Multiple Alleles, Gene Interaction. The Interaction Between Sex and Heredity: Sex-Influenced and Sex-Limited Characteristics Cytoplasmic Inheritance, Genetic Maternal Effects. Interaction between Genes and Environment: Environmental Effect on Gene Expression, Inheritance of Continuous Characteristics 	14	

Hu	man Chromosomes and Patterns of Inheritance	14
Unit IV Info	 Patterns of inheritance: autosomal dominance, autosomal recessive, X-linked recessive, X-linked dominant. Chromosomal anomalies: Structural and numerical aberrations with examples. Human karyotyping. ectious Diseases Introduction to pathogenic organisms: viruses, bacteria, fungi, protozoa and worms. Structure, lifecycle, pathogenicity, including diseases, causes, symptoms and control of common parasites: <i>Trypanosoma, Giardiaand Wuchereria</i> 	14

References :

- 1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA(2004).
- 2. Alberts et al: Molecular Biology of the Cell: Garland (2002).
- 3. Cooper: Cell: A Molecular Approach: ASM Press (2000).
- 4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman (2004).
- 5. Lewin B. Genes VIII. Pearson (2004).
- 6. Watson et al. Molecular Biology of the Gene. Pearson (2004).
- 7. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby-Kuby Immunology.W H Freeman (2007).
- 8. Delves Peter J., Martin Seamus J., Burton Dennis R., Roitt Ivan M. Roitt's
- EssentialImmunology, 13thEdition. Wiley Blackwell (2017).
- 9. Principles of Genetics by B. D. Singh
- 10. Cell-Biology by C. B. Pawar, Kalyani Publications
- 11. Economic Zoology by Shukla and Upadhyaya

Pedagogy: Written Assignment/Presentation/Project / Term Papers/Seminar

Formative Assessment					
Assessment Occasion	Weightage in Marks				
House Examination/Test	10				
Written Assignment/Presentation/Project / Term Papers/Seminar	15				
Class performance/Participation	05				
Tota 1	30				

Zoology -Lab Course Content

Semester - I

Course Title: Cell Biology & Cytogenetics	Course Credits:2
Course Code: 126BSC02ZOODSC01L	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA:4 Hours
Formative Assessment Marks: 15	Summative AssessmentMarks:35

Course Outcomes (COs):

At the end of the course the student should be able to:

- 1. To use simple and compound microscopes.
- 2. To prepare stained slides to observe the cell organelles.
- 3. To be familiar with the basic principle of life, how a cell divides leading to the growth of anorganism and also reproduces to form new organisms.
- 4. The chromosomal aberrations by preparing karyotypes.

5. How chromosomal aberrations are inherited in humans by pedigree analysis in families The antigen-antibody reaction

Lab Course Content

List of	Labs	56hrs
1		
1.	Understanding of simple and compound microscopes.	
2.	To study different cell types such as buccal epithelial cells, neurons, striated muscle cells using Methylene blue/any suitable stain (virtual/ slaughtered tissue).	
3.	To study the different stages of Mitosis in root tip of Allium cepa.	
4.	To study the different stages of Meiosis in grasshopper testis (virtual).	
5.	To check the permeability of cells using salt solution of different concentrations.	
6.	Study of parasites in humans (e.g. Protozoans, Helminthes in compliance with examples being studied in theory) permanent microslides.	
7.	To learn the procedures of preparation of temporary and permanent stained slides, with available mounting material.	
8.	Study of mutant phenotypes of Drosophila sp. (from Cultures or Photographs).	
9.	Preparation of polytene chromosomes (Chironomus larva or Drosophila larva).	
10.	Preparation of human karyotype and study the chromosomal structural and numerical aberrations from the pictures provided. (Virtual/optional)	

Reference :

- 1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA(2004).
- 2. Alberts et al: Molecular Biology of the Cell: Garland(2002).
- 3. Cooper: Cell: A Molecular Approach: ASM Press(2000).
- 4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman(2004).
- 5. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby-KubyImmunology. W H Freeman(2007).
- 6. Kesar, Saroj and Vasishta N.2007 Experimental Physiology: Comprehensive Manual.Heritage Publishers, NewDelhi.

Pedagogy: Practical Examination format

Question	Content	Marks
Ι	Preparation	05
II	Karyotype	06
III	Identification	14
IV	Vivo	05
V	Record Book	05
	Total	35

Year	Ι	Course Code: 126BSC01ZOOOEC01T	Credits	03
Sem.	1	Course Title: Economic Zoology	Hours	42
Unit No.		Course Content	Hour	'S
Unit I		 1. Sericulture: History and present status of sericulture in India Mulberry and non-mulberry species in Karnataka and India Mulberry cultivation Morphology and life cycle of <i>Bombyx mori</i> Silkworm rearing techniques: Processing of cocoon, reeling Silkworm diseases and pest control 2. Apiculture: Introduction and present status of apiculture Species of honey bees in India, life cycle of <i>Apis indica</i> Colony organization, division of labor and communication Bee keeping as an agro based industry; methods and equipments: indigenous methods, extraction appliances, extraction of honey from the comb and processing Bee pasturage, honey and bees wax and their uses Pests and diseases of bees and their management 	14	
Unit II		 3. Live Stock Management: Dairy: Introduction to common dairy animals and techniques of dairy management Types, loose housing system and conventional barn system; advantages and limitations of dairy farming Establishment of dairy farm and choosing suitable dairy animals-cattle Cattle feeds, milk and milk products Cattle diseases Poultry: Types of breeds and their rearing methods Feed formulations for chicks Nutritive value of egg and meat Disease of poultry and control measures 4. Aquaculture: Aquaculture in India: An overview and present status and scope of aquaculture. Types of aquacultures: Pond culture: Construction, maintenance and management; carp culture, shrimp culture, shellfish culture, composite fish culture and pearl culture 	14	
Unit II	I	5. Fish culture:Common fishes used for culture.	14	

OPEN-ELECTIVE SYLLABUS

•	Fishing crafts and gears. Ornamental fish culture: Fresh water ornamental fishes- biology, breeding techniques Construction and maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater	
•	aquaria, aquarium plants, ornamental objects, cleaning the aquarium, maintenance of water quality. control of snail and algal growth. Modern techniques of fish seed production	
6 Pr	wodern teeningues of fish seed production	
•	Culture of fresh and marine water prawns. Preparation of farm. Preservation and processing of prawn, export of prawn	
7 Ve	rmiculture	
7. ve • •	Scope of vermiculture. Types of earthworms. Habit categories - epigeic, endogeic and anecic; indigenous and exotic species. Methodology of Vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of vermicompost.	
•	Advantages of vermicomposting.	
	Diseases and pasts of earthworms	
81.9	ac Culture:	
•	History of lac and its organization, lac production in India. Life cycle, host plants and strains of lac insect. Lac cultivation: Local practice, improved practice, propagation of lac insect, inoculation period, harvesting of lac. Lac composition, processing, products, uses.	

Text Books: Suggested Readings:

- Eikichi, H. (1999). Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co.Pvt. Ltd., New Delhi.
- 2. Ganga, G. (2003). Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling.
- 3. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- 4. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., (2000). Mulberry Silk
- 5. Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- 6. Roger, M (1990). The ABC and Xyz of Bee Culture: An Encyclopedia of Beekeeping, KindleEdition.

- 7. Shukla and Upadhyaya (2002). Economic Zoology, Rastogi Publishers
- 8. YadavManju (2003). Economic Zoology, Discovery Publishing House.
- 9. JabdePradip V (2005). Textbook of applied Zoology, Discovery Publishing House, New Delhi.
- 10. Cherian & Ramachandran Bee keeping in-South Indian Govt. Press, Madras.
- 11. Sathe, T.V. Vermiculture and Organic farming.
- 12. Bard. J (1986). Handbook of Tropical Aquaculture.
- 13. Santhanam, R. A. Manual of Aquaculture.
- 14. Zuka. R.1 and Hamiyn (1971). Aquarium fishes and plants
- 15. Jabde, P.V. (2005) Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac culture.
- 16. Animal Disease- Bairagi K. N. Anmol Publications Pvt.Ltd 2014
- 17. Economics of Aquaculture Singh (R.K.P) Danika Publishing Company 2003

 Applied and Economic Zoology (SWAYAM) web <u>https://swayam.gov.in/nd2_cec20_ge23/preview</u> Course Books published in Englishand Kannada may be prescribed by the Universities and College

Pedagogy: Chalk and Talk, PPT, Group discussion, Seminar, Field visit

Semester: II

Year	Ι	Course Code: 126BSC02ZOODSC02T	Credi	04
			ts	
Sem.	2	Course Title: Biochemistry and Physiology	Hours	56
Unit N	lo.	Course Content	Ηοι	irs
Unit I		 Structure and Function of Biomolecules: Structure and Biological importance of carbohydrates (Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates). Lipids (saturated and unsaturated Fatty acids, Triacylglycerols, Phospho lipids, Glycolipids and Steroids) Structure, Classification and General Properties of <i>α</i>-amino acids; Essential and non-essential amino acids, Levels of organization in proteins; Simple and conjugate proteins. Enzyme Action and Regulation Nomenclature and classification of enzymes; Cofactors; Specificity of enzyme action. Isozymes; Mechanism of enzyme action Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Equation of Michaela's -Mendon, Concept of Km and V max, Enzyme inhibition Allosteric enzymes and their kinetics; Regulation of 		14
Unit II	[Metabolism of Carbohydrates and Lipids Metabolism of Carbohydrates: glycolysis, citric acid cycle, gluconeogenesis; phosphate pentose pathway Glycogenolysis and Glycogenesis Lipids- Biosynthesis of palmitic acid; Ketogenesis, β-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms Metabolism of Proteins and Nucleotides Catabolism of amino acids: Transamination, Deamination, Urea cycle, Nucleotides, and vitamins Peptide linkages 		14

	Digestion and Respiration in humans	14
	 Structural organization and functions of 	
	gastrointestinal tract and associated glands.	
Unit III	• Mechanical and chemical digestion of food; Absorptionsof	
	carbohydrates, lipids, proteins, water, minerals and	
	vitamins; Physiology of trachea and Lung.	
	Mechanism of respiration, Pulmonary	
	ventilation; Respiratory volumes and capacities; Transport	
	of oxygen and carbon dioxide in blood, Respiratory	
	pigments, Dissociation curves and the factors influencing	
	it.	
	Circulation and Excretion in humans	
	• Components of blood and their functions; hemopoiesis	
	• Blood clotting: Blood clotting system, Blood groups:	
	Rh-factor, ABO and MN	
	• Structure of mammalian heart	
	• Cardiac cycle; Cardiac output and its regulation,	
	Electrocardiogram, Blood pressure and its	
	regulation	
	Structure of kidney and its functional unit; Mechanism of	
	urine formation	
Unit IV	Nervous System and Endocrinology in humans	14
	• Structure of neuron, resting membrane potential(RMP)	
	• Origin of action potential and its propagation across the	
	myelinated and unmyelinated nerve fibers. Types of	
	synapse	
	Endocrine glands - pineal, pituitary, thyroid, parathyroid,	
	pancreas and adrenal gland	
	1 0	
	Muscular System in humans: Histology of different types of	
	muscle; Ultra structure of skeletal muscle; Molecular and	
	chemical basis of muscle contraction; Characteristics of muscle	
	twitch; Motor unit, summation and tetanus.	

Suggested Readings

- 1. Nelson & Cox: Leininger's Principles of Biochemistry: McMillan (2000)
- 2. Zubay et al: Principles of Biochemistry: WCB (1995)
- 3. Voet & Voet: Biochemistry Vols I & 2: Wiley (2004)
- 4. Murray et al: Harper's Illustrated Biochemistry: McGraw Hill (2003) Elliott and Elliott: Biochemistry and Molecular Biology: Oxford University Press
- 5. Guyton, A.C. & Hall, J.E. Textbook of Medical Physiology, Xl Edition, Hercourt Asia PTE Ltd. /W.B.Saunders Company. (2006).
- 6. Tortora, G.J. & Grabowski, S. Principles of Anatomy & Physiology. XI Edition John Wiley& sons (2006).
- 7. Christopher D. Moyes, Patricia M. Schulte. Principles of Animal Physiology. 3rd Edition, Pearson Education (2016).
- 8. Hill, Richard W., et al. Anima l physiology. Vol. 2. Sunderland, MA: Sinauer Associates, (2004).
- Chatterjee CC Human Physiology Volume 1 & 2, 11th edition, CBS Publishers (20 I 6).

Semester II: Zoology Course Lab Content

Course Title/Code: Biochemistry andPhysiology	Course Credits: 2
Course Code: 126BSC02ZOODSC02L	L-T-P per week: 0-0-4
Total Contact Hours: 56	Duration of ESA: 4 Hours
Formative Assessment Marks: 15	Summative AssessmentMarks:35

Course Outcomes (COs):

- At the end of the course the student should be able to understand: Basic structure of biomolecules through model making.
- Develop the skills to identify different types of blood cells.
- Enhance basic laboratory skill like keen observation, analysis and discussion. Learn the functional attributes of biomolecules in animal body.
- Know uniqueness of enzymes in animal body and their importance through enzyme kinetics.

Lab Course Content

List of labs to be conducted	Hours
1. Preparation of models of nitrogenous bases- nucleosides and nucleotides.	20
2. Preparation of models of amino acids and dipeptides.	
3. Preparation of models of DNA and RNA.	
4. Qualitative analysis of Carbohydrates, Proteins and Lipids.	
5. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid.	
6. Separation of amino acids or proteins by paper chromatography.	
7. Determination of the activity of enzyme (Urease)-Effect of [S] and determination of -Km and Vmax.	15
8. Determination of the activity of enzyme (Urease) - Effect of temperature and time.	

10. Estimation of Hemoglobin in human blood using	15
Sahli'shaemoglobinometer.	
11. Counting of RBC in blood using Hemocytometer.	
12. Counting of WBC in blood using Hemocytometer.	
13. Differential staining of human blood corpuscles using Leishman stain.	
14. Recording of blood glucose level by using glucometer.	
Virtual Labs (Suggestive sites)	06
https://www.vlab.co.in	
https://zoologysan.blogspot.com	
www.vlab.iitb.ac.in/vlab	
https://vlab.amrita.edu	
https://sites.dartmouth.edu	
www.onlinelabs.in	

Text Books

- 1. Nelson & Cox: Lehininger's Principles of Biochemistry: McMillan (2000)
- 2. Zubay et al: Principles of Biochemistry: WCB (1995)
- 3. Voet&Voet: Biochemistry Vols 1 & 2: Wiley (2004)
- 4. Murray et al: Harper's Illustrated Biochemistry: McGraw Hill (2003) Elliott and Elliott: Biochemistry and Molecular Biology: Oxford University Press
- 5. Guyton, A.C. & Hall, J.E. Textbook of Medical Physiology, Xl Edition, Hercourt Asia PTE Ltd. /W.B.Saunders Company. (2006).
- 6. Tortora, G.J. & Grabowski, S. Principles of Anatomy & Physiology. XI Edition John Wiley & sons (2006).
- 7. Christopher D. Moyes, Patricia M. Schulte. Principles of Animal Physiology. 3rd Edition, Pearson Education (2016).
- 8. Hill, Richard W., et al. Anima l physiology. Vol. 2. Sunderland, MA: Sinauer Associates, (2004).
- 9. Chatterjee CC Human Physiology Volume 1 & 2, 11th edition, CBS Publishers (2016).

Web References: Mammalian Physiology-<u>www.biopac.com</u>

Pedagogy: Lectures, Presentations, videos, Virtual Labs, Assignments, Tests, Individual or group Field oriented Project Report on or visit to a research institute.

TOPICS RECOMMENDED FOR SEMINAR/PROJECT REPORT

- 1. Biochemical pathways, their evolutionary background and regulation.
- 2. Blood groups and their importance.
- 3. Vital enzymes for human body.
- 4. Essential and nonessential amino acids.
- 5. Important body lipids.
- 6. Significance of animal proteins.
- 7. Role of carbohydrates in animal body.
- 8. Nature of proteins and nurture of animal body.
- 9. Role of lipids in structural and functional organization of body.

Question	Content	Marks
Ι	Qualitative test/Separation	09
Π	Quantitative test/Differential count	09
III	Estimation/Counting	09
IV	Vivo	03
V	Record Book	05
	Total	35

Pedagogy: Practical Examination format

Year	Ι	Course Code: 126BSC02ZOOOEC02T	Credi	03
		Course Title: Parasitology	ts	
Sem	II		Hours	42
Unit N	lo.	Course Content	Hour	S
		1. General Concepts	14	
		• Introduction, Parasites, parasitoids, host, zoonosis		
		• Origin and evolution of parasites		
		• Basic concept of Parasitism, symbiosis, phoresis,		
		commensalisms and mutualism		
		Host-parasite interactions and adaptations		
		• Life cycle of human parasites		
		• Occurrence, mode of infection and prophylaxis		
		2. Parasitic Platyhelminthes		
TT:::4 T		Study of morphology, life cycle, pathogenicity, prophylaxis and control measures of		
Unit I		<i>Fasciolopsisbuski</i>		
		Schistosomahaematobium		
		Taeniasolium		
		Hymenolepis nana		
		3. Parasitic Protists		
		Study of morphology, life cycle, pathogenicity, prophylaxis		
		and control <i>measures</i> of		
		Entamoeba histolytica		
		Giardia intestinalis		
		Trypanosomagambiense		
		Plasmodium vivax		
		4. Parasitic Nematodes	14	
		Study of morphology, life cycle, pathogenicity, prophylaxis		
		and control measures of		
		Ascarisiumoricolaes Ancolostomaduodanala		
		 Ancytostomuutoaenate Wuchereriabancrofti 		
		 Trichinellaspiralis 		
		Nematode plant interaction; Gall formation		
		5. Parasitic Arthropods		
Unit II		Biology, Importance and control of		
		• Ticks (Soft tick <i>Ornithodoros</i> , Hard tick <i>Ixodes</i>)		
		• Mites (Sarcoptes)		
		• Lice (<i>Pediculus</i>)		
		 Bug (Cimer) 		
		 Parasitoid (Beetles) 		
		6. Parasitic Vertebrates		
		Cookie cutter Shark		
		• Hood Mockingbird and Vampire bat and their parasitic		
		behavior and effect on host		
1				

OPEN-ELECTIVE SYLLABUS:

	7. Molecular diagnosis & clinical parasitology	14					
	• General concept of molecular diagnosis for parasitic						
	infection						
	• Advantages and disadvantages of molecular diagnosis						
	• Fundamental techniques used in molecular diagnosis						
	of endoparasites.						
Unit III	• Immunoassay or serological techniques for						
	laboratory diagnosis of endoparasites on the basis of						
	marker molecules like G.intestinalis, B. coli, E.						
	histolytica, L. donovani, Malarial parasite using						
	• ELISA, RIA						
	Counter Current Immunoelectrophoresis (CCI)						
	Complement Fixation Test (CFT) PCR, DNA, RNA probe						

Suggested Readings:

- 1. Arora, D. R and Arora, B. (2001) Medical Parasitology. II Edition. CBS Publications andDistributors.
- 2. E.R. Noble and G.A. Noble (1982) Parasitology: The biology of animal parasites. V Edition,Lea&Febiger.
- 3. Ahmed, N., Dawson, M., Smith, C. and Wood, Ed. (2007) Biology of Disease. Taylor and Francis Group.
- 4. Parija, S. C. Textbook of medical parasitology, protozoology & helminthology (Text andcolour Atlas), II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
- 5 Meyer, Olsen & Schmidt's Essentials of Parasitology, Murray, D. Dailey, W.C. BrownPublishers.
- 5. K. D. Chatterjee (2009). Parasitology: Protozoology and Helminthology. XIII Edition, CBSPublishers & Distributors (P) Ltd.
- 6. Gunn, A. and Pitt, S.J. (2012). Parasitology: an Integrated Approach. Wiley Blackwell.
- 7. Noble, E. R. and G.A.Noble (1982) Parasitology: The biology of animal parasites. V thEdition, Lea &Febiger.
- 8. Paniker, C.K.J., Ghosh, S. [Ed] (2013). Paniker's Text Book of Medical Parasitology.Jaypee, New Delhi.
- 9. Parija,S.C. Text book of medical parasitology,protozoology&helminthology (Textand colorAtlas),II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
- Roberts, L.S and Janovy, J. (2009). Smith & Robert's Foundation of Parasitology. 8th. Edn.McGraw Bogitsh, B. J. and Cheng, T. C. (2000). Human Parasitology. 2nd Ed. Academic Press, New York.
- 11. Chandler, A. C. and Read. C. P. (1961). Introduction to Parasitology, 10th ed. John Wileyand Sons Inc.
- 12. Cheng, T. C. (1986). General Parasitology. 2nd ed. Academic Press, Inc. Orlando.U.S.A.
- 13. Schmidt, G. D. (1989). Essentials of Parasitology. Wm. C. Brown Publishers (Indianprint1990, Universal Book Stall).
- 14. John Hyde (1996) Molecular Parasitology Open University Press.

Pedagogy: Chalk and Talk, PPT, Group discussion, Seminar, Interaction, virtual lab visit.,



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301 DIST: BAGALKOTE

ELECTRONICS

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi, applicable

from the

Academic Year 2023-24

PROGRAM STRUCTURE

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Proposed Curricular and Credits Structure under Choice Based Credit System [CBCS] of Electronics Major & One Minor Discipline Scheme for the Three Year(Six semester)/ Four Years (Eight semester) ELECTRONICS B.Sc/B.Sc. Honors Programme with effect from 2023-24.

SEMESTER-I										
Catego ry	Course code	Title of the		Mark	KS	To hou	eachi 1rs/w	ng ⁄eek	Credit	Durati on of
		Paper	IA	SEE	Total	L	Т	Р		exams (Hrs)
DSC1	126BSC01ELEDSC01 T	Electronic Devices and Circuits.	40	60	100	4	-	-	4	2
	126BSC01ELEDSC01 L	Practical I	25	25	50	-	-	4	2	4
OEC1	126BSC01ELEOEC0 1T	Basics of Electronics, Computers and PCB Design	40	60	100	3		-	3	2

SEMEST	SEMESTER-II									
Category	Course code	Title of the Paper]	Mark	s	Te ho	eaching urs/wee k		Cred	Duratio n of
			IA	SE E	Tot al	L	Т	Р	It	exams (Hrs)
DSC2	126BSC02ELEDSC0 2T	Analog and Digital Electro nics	40	60	10 0	4	-	-	4	2
	126BSC02ELEDSC0 2L	Practical II	25	25	50	-	-	4	2	4
OEC2	126BSC02ELEOEC0 2T	Electronic s for Everyone	40	60	10 0	3	-	-	3	2

COURSE-WISE SYLLABUS Semester I

Year	Ι	Course Code: 126BSC	C01ELEDSC01T	Credits	04			
Sem.	1	Course Title: ELEC	TRONIC DEVICES AND CIRCUITS	Hours	52			
Course	Pre-re	quisites, if any	NA		<u> </u>			
Format	ive As	sessment Marks: 40	Summative Assessment Marks: 60 Duration	n of ESA: 2	2 hrs.			
Course)	At the end of the cour	rse the student should be able to:					
Outcor	nes	1. At the end of	the course the student should be able to:					
		2. Study and ana	lyse basic networks using network theorems in a sys	tematic				
		manner.						
		3. Build simple electronic circuits used in various applications.						
		4. Describe the behaviour of basic semiconductor devices						
		5. Reproduce the	e I-V characteristics of diode/BJT devices					
		6. Describe the f	requency response of BJT amplifiers.					
		7. Explain the be	ehaviour, characteristics and applications of Varacto	r diode,				
		Schottky diod	e, Tunnel diode, LED, LCD and solar cells.					
		8. Apply standa	rd device models to explain/calculate critical inter	nal				
		parameters of	semiconductor devices.					
		9. Understand a	nd represent numbers in powers of base and convert	ing one				
		from the other	r, carry out simple arithmetic operations.					
		Understand the basic	knowledge of Digital system building blocks, eff	ectively				
		can construct simple	digital designs with the knowledge of Boolean algeb	ra.				
Unit No	0.		Course Content	H	ours			
Unit- I		Electronic Component their properties, Control power (Qualitative or Network Theorems: Transfer, and Recipro- series and parallel ci PN junction diode: I Diode I-V characteries Reverse saturation cu Rectifiers-Half wave expressions for output Filters: Filters and the Chock input or LC them (study of wave applicable).	ents: Electronic passive and active components, types cept of Voltage and Current Sources, electric energy hly). Superposition, Thevenin's, Norton's, Maximum Po- ocity Theorems. AC analysis of RC and RL circuits, I freuits, Resonant circuits. Ideal and practical diodes, Formation of Depletion L stics. Idea of static and dynamic resistance, Zener d rrent, Zener and avalanche breakdown. and Full wave (center tap and bridge) rectifiers, it voltage, ripple factor and efficiency (mention only types of filters, Capacitor filter, Series inductor fi filter and Capacitor input filter, Comparison betw forms qualitative). (Numerical examples wherever	and and wer RLC ayer, ode, o, ter, een	13			
Unit- I	I	Voltage regulator: C power supply, Line advantages and disa (78xx, 79xx, LM317) only), Voltage Multip Bipolar Junction configurations (ment Regions of operation only), Current gains point. Applications o (Numerical examples)	Concept of voltage regulation, Block diagram of regulation, Zener diode as voltage regulation, Zener diode as voltage regulation, dvantages. Fixed and Variable IC Voltage Regula, Clippers (shunt type) and clampers (Qualitative anabliers. Transistor: Construction, types, CE, CB and ion only), V-I characteristics of a transistor in CE n (active, cut off and saturation), leakage currents (me α , β and γ and their inter-relations, dc load line as f transistor as amplifier and switch - circuit and wor swherever applicable).	lated ator, ators lysis CC node, ntion nd Q king.	13			

Unit -III	 Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor. Two-port network: z,y,h parameters of a two port network. Transistor as a two-port network, h-parameter equivalent circuit. Amplifier: Small signal analysis of single stage CE amplifier using h-parameters. Input and Output impedances, Current and Voltage gains. Advantages of CC amplifier. Class A, B and C Amplifiers (qualitative). Types of coupling, two stage RC Coupled Amplifier – circuit, working and its Frequency Response, GBW product. Special semiconductor diodes: Construction, characteristics, working, symbol, and applications for LED, LCD solar cell and 7-segment display, concept of common anode and common cathode types. (Numerical problems, wherever applicable) 	13				
Unit -IV	 Number System: Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, Binary arithmetic; addition, subtraction by 1's and 2's complement method, BCD code (8421, 2421, Excess-3), Gray code. Boolean Algebra: Basic logic gates-AND, OR, NOT, Positive and negative logic, Boolean laws, Duality Theorem, De Morgan's Theorem, Simplification of Boolean expressions-SOP and POS. Derived logic gates (NAND, NOR, XOR & XNOR). Universal property of NOR and NAND gates. (Numerical examples wherever applicable). 					
	Recommended Leaning Resources					
Reference Books	 VK Mehta "Principles of Electronics" N N Bhargav "Basic Electronics" A Sudhakar "Network Analysis" R S Sedha "Applied Electronics" Brijlal and Subramanayam "Electricity and Magnetism" Robert L Boylestad, "Introductory circuit analysis", 5th edition., Universal Book-2003. A.P. Malvino, "Principles of Electronics", 7th edition. TMH, 2011. Electronic devices and circuit theory by Boylestad, Robert Nashelsky. David A. Bell "Electronic Devices and Circuits", 5th Edition, Oxford Uni. Press, 2015 Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994) Digital Systems: Principles & Applications, R.J. Tocci, N.S.Widmer, 2001, PHI Learning. 					

Laboratory Experiments:

Year	Ι	Course Code: 126BSC01ELEDSC01L	Credits	2			
Sem.	1	Course Title: Electronic Devices and Circuits	Hours	4			
		(Hardware and Circuit Simulation Software)		Hrs/week			
Format	ive As	sessment Marks: 25 Summative Assessment Marks: 25 Duration	n of ESA: 4	4 hrs			
Sl. No		Experiment					
		Demonstration Experiment: Familiarization with					
		a) Electronic components					
		b) Resistance in series, parallel and series-parallel					
		c) Capacitors and inductors in series and parallel					
1		d) Multimeter and LCR meter – checking of component	ents / mea	surements.			
		e) Voltage sources in series, parallel and series-paral	lel				
		f) Voltage and current dividers					
		g) Measurement of Amplitude. Frequency & Phase	difference	using			
		oscilloscope.		8			
2		Verification of Thevenin's Theorem / Verification of Norton's Theor	em.				
3		Verification of Maximum Power Transfer Theorem.					
4		Verification of Superposition Theorem.					
5		Study of the I-V Characteristics of Zener diode.					
6		Study of the I-V Characteristics of LEDs of two different colours and	l 7-segmer	ıt display.			
7		Study of Half wave rectifier without and with shunt capacitor filter– ripple factor for different values of filter capacitors.					
8		Study of full wave bridge rectifier without and with shunt capacitor f for different values of filter capacitors.	ïlter –rippl	e factor			
9		Study of Zener diode as a Voltage Regulator using bridge rectifier wir filter [Load and line regulation].	ith shunt c	apacitor			
10)	Study of Clipping, Clamping and Voltage Multiplier circuits.					
11		Designing and testing of fixed positive and negative voltage regulato 79xx series ICs (Using bridge rectifier and shunt capacitor filter).	ors using 78	3xx and			
12	2	Designing and testing of variable voltage regulator using IC LM317 rectifier and shunt capacitor filter).	(Using brid	dge			
13		Study of Transistor characteristics in CE configuration - determination	on of h- pa	rameters.			
14	-	Study of Fixed Bias and Voltage divider bias circuits - comparison f	or differen	t β values			
15	i	Study of single stage CE amplifier (frequency response, input and ou mid-band)	tput impec	lances in			
16	<u>,</u>	Study of two-stage RC-coupled CE amplifier (AV1, AV2, AV) at mi	d-band fre	quency.			
		Study of Series and Parallel Resonance circuits – determination of its (a) Resonant frequency	5				
17		(b) Impedance at resonance					
		(c) Bandwidth					
		(d) Quality Factor					
18	}	Verification of truth tables of OR, AND, NOT, NAND, NOR, XOR	and XNOF	R gates			
10		using respective ICs. Realization of XOR and XNOR using basic gat	tes.				
19)	Universal property of NAND and NOR gates.		OD estat			
20)	Binary to Gray and Gray to Binary code conversion and parity check IC 7486	er using X	OK gates			

OPEN ELECTIVE

Year	Ι	Course Code: 126BSC01ELEOEC01TCreation			Credits	03		
Sem.	1	Course Title: Basics of Electronics, Computers and PCB Design			Hours	40		
Course Pre	e-requi	sites, if any	NA					
Formative Assessment Marks: 40Summative Assessment Marks: 60Duration of ESA:								
TT •4 NT		1			TT			
Unit No.		Course Content			H	ours		
Unit- I		 Basics Electronics: Basic circuit elements (Resistor, Inductor & Capacitor), Basic principle of Transformer. Wave form types (Sine, Square, Triangular, Trigger pulses & Saw tooth). Voltage & Current sources. Ohms law, Kirchhoff's laws- Statement. Basics of SemiconductorDiode, Zener diode, LED, Transistor (Symbol and types only), Basics of IC. COMPUTER CONCEPTS: Introduction to computer, brief history of computer generations, block diagram of Computer system, central processing unit (CPU), ALU, Control Unit, main memory, Secondary memory, Cache memory. Hardware: Input devices (Key board, mouse and scanner). Output devices (various types of printers). Secondary storage devices (CDROM, optical disk). Software: System software, Operating system & Application software. Machine Language, Assembly Language & High-Level Language. Assembler, Compiler and Editor. Algorithm, Characteristics of an algorithm and flow charts. Inverter: Inverter, Uninterrupted Power supply (UPS) – online and off line UPS, SMPS. 						
Unit- II	PCB Design: Types of PCB, Single sided board – double sided – Multilay boards – Plated through holes technology – Benefits of Surface Mou Technology (SMT) – Limitation of SMT – Surface mount component Resistors, Capacitor, Inductor, Diode and IC's.Unit- IILAYOUT AND ARTWORK: Layout Planning – General rules of Layou – Resistance, Capacitance and Inductance – Conductor Spacing – Supp and Ground Conductors – Component Placing and mounting–Coolin requirement and package density–Layout check. Basic artwork approache Artwork taping guideline–General artwork rules– artwork check an Inspection			ayer ount nts: 10 out oply ling nes— and)			
Unit -III		Inspection. LAMINATES AND PHOTO PRINTING: Manufacture of copper clad laminates – Properties of laminates – Types of Laminates – Manual cleaning process – Basic printing process for double sided PCB's – Photo resists – wet film resists – Coating process for wet film resists – Exposure and further process for wet film resists – Dry film resists.						
Unit -IV ETCHING AND SOLDERING: Introduction – Etching machine Etchant system. Soldering: Principles of Solder connection – Solder joints – Solder alloys – Soldering fluxes. Soldering Tools: Soldering, Desoldering tools and Techniques – Man Soldering – Solder mask – Safety, health and medical aspects in Soldering practice.				e – ints ring and	10			
Demonstr	- , ation	2. Types of PC	B and fabrication process.					
Recommended Leaning Resources								

Reference	1. Computer fundamentals - Anita Goel, Pearson Edition.				
Books	2. Fundamentals of Computers - V Rajaram, NeeharikaAdabala - PHI.				
	3. Computer Fundamentals - Peter Norton, McGraw-Hill Education				
	4. Walter C. Bosshart "PCB Design and Technology" Tata McGraw Hill,				
	Publications, Delhi. 1983.				
	5. Clyde F. Coombs "Printed circuits Handbook" III Edition McGraw-Hill Kraig				
	Mitzner, "Complete PCB Design Using OrCAD Capture and Layout," Elsevier,				
	Amsterdam,				
	6. Walter C Bosshart, "Printed Circuit Board Design and Technology",1st ed.,				
	McGraw Hill Education				

Semester II

Year	Ι	Course Code: 126BS	C02ELEDSC02T		Credits	04		
Sem.	1	Course Title: ANA	LOG AND DIGITAL ELECTRONIC	CS	Hours	52		
Course	Pre-re	quisites, if any	NA					
Format	ive As	sessment Marks: 40	Summative Assessment Marks: 60	Duration	n of ESA: 2	2 hrs.		
Course	;	At the end of the course the student should be able to:						
Outcor	nes	1. Reproduce the I-V characteristics of various MOSFET devices,						
		2. Explain the behavior and characteristics of power devices such as UJT, SCR, Diac,						
	Triac etc.							
		3. Calculate various of	levice parameters' values from their V	I charact	teristics.			
		4.Explain various O	4. Explain various Operational amplifier parameters					
		5.List various applic	5.List various applications of Operational amplifier.					
		6.Explain IC 555 as	a timer with applications					
		/.Understand K-Map and simplify Boolean expressions						
TI:4 NI		8. Analyse combinato				Hanna		
Unit N	0.	IFFT. Trues a sha	Course Content	.	ation a	Hours		
		JFEI: Types - p-cha	innel and n-channel, working and I-V cl	naracteri	Stics - n-			
		channel JFET, parameters and their relationships, Comparison of BJT and						
		JFE1. MOSEET. Enhancement MOSEET. Depletion MOSEET (n channel and n						
		channel) Construction working symbols drain and transfer characteristics						
		VMOS LIMOS Power MOSEETs handling MOS logic symbols and						
Unit- I		switching action of MOS NMOS inverter						
		UJT: Basic construction, working, equivalent circuit and I-V characteristics.						
		intrinsic stand-off ratio, relaxation oscillator.						
		SCR: Construction, VI characteristics, working, symbol, and applications –						
		HWR and FWR.						
		DIAC and TRIAC: Construction, working, characteristics, applications,						
		(mention only).						
		Operational Ampli	fier: Qualitative study of Differentia	1 Ampli	fier, four			
		modes of Differential Amplifier, Basic information of Op-amp (Types of IC						
		Manufactures designations Package Types, Temperature ranges and pin						
		identifications. Block diagram of Op-amp, ideal version of operational						
		amplifier. Operational amplifier parameters input offset voltage, input offset						
		current, input bias current, Total output offset voltage Thermal drift, CMRR						
		and Slew Rate Explanation of voltage offset null circuit for 741. Concept of						
		virtual ground. Voltage series (non-inverting) and Voltage-shunt (Inverting)						
Unit T	т	negative feedback circuits' derivation of voltage gain input resistance, output						
Unit- II	L	APPLICATIONS OF OP AMPLIFIED. On amp addar Subtractor						
		Current to Voltage converter and Voltage to Current converter circuits. Low						
		voltage DC voltmeter. Integrator Differentiator Qualitative study of on- amp						
		as comparator						
		Filter: First order active filters- low pass & high pass Filters, hand pass band						
		reject filters. (Qualitative only).						
		Timer (IC 555): Introduction, Block diagram, Astable and Monostable						
		multivibrator circuits. (Numerical Examples wherever applicable).						
Unit -T	IT	Logic Families: Log	gic Families-classification of digital ICs	s. Charao	cteristics			
		of logic families, ci	rcuit description of TTL NAND gate	with to	tem pole			
	and open collector. TTL IC terminology. CMOS NAND, comparison of TTL							
-----------	-------------------------------------------------------------------------------	-------------						
	and CMOS families. Combinational Logic Circuits: SOP and POS, Minterm,							
	Maxterm, SOP, SPOS, Simplification of Boolean expressions,							
	Karnaugh map							
	(2, 3 and 4 variable map) Pair, quad and octets. Simplification of Boolean							
	function using K-map (Overlapping groups, rolling the map, redundant group							
	and Don't care conditions).							
	Design of Arithmetic logic circuits: Half Adder, Full Adder, Half							
	Subtractor, Full Subtractor, 4-bit parallel binary adder, 2-bit and 4-Bit	13						
	magnitude comparator. Encoder, decimal to BCD priority encoder, Decoder,							
	2:4 decoder. 3:8 decoder. BCD to decimal decoder. BCD to 7-Segment							
	decoder Multiplexer - 4.1 and 8.1 multiplexer Demultiplexer - 1.4 and 1.8							
	demultiplexer - logic diagram and truth table of each							
	Sequential Logic Circuits: Elin-Elons - SR Latch RS D and IK Elin- Elons							
	Clocked (I evel and Edge Triggered) Elin-Elons Pre-set and Clear operations							
	Race- around conditions in IK Flin-Flon Master- Slave IK and Flin-Flons							
	Applications of Elip Elops in semiconductor memories RAM ROM and							
	types	13						
Unit IV	Desisters and Counters: Types of Shift Desisters Seriel in Seriel out	13						
	Registers and Counters: Types of Sinit Registers, Senai-in-Senai-out,							
	Senai-III- Paranei-oui, Paranei-III-Senai-oui and Paranei-III-Paranei-oui							
	Sint Registers (only up to 4 bits), applications. Counters: King counter,							
	Johnson counter applications. Asynchronous Counters: Logic diagram,							
	Fruth table and timing diagrams of 4-bit ripple counter, modulo-n counters.							
	Synchronous Counter: 4-bit decade Counters.							
	Recommended Leaning Resources							
Reference	(1) Electronic devices and circuit theory by Boylestad, Robert Nashelsky							
Books	(2) Electronic Devices Conventional Current Version by Thomas L. Floyd							
	(3) David A. Bell "Electronic Devices and Circuits", 5th Edition, Oxford	Uni.Press,						
	2015	,						
	(4) OP-Amps and Linear Integrated Circuit, R. A. Gavakwad, 4th edn, 200	0. Prentice						
	Hall	- ,						
	(5) Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 201	1, Oxford						
	University Press.	,						
	(6) R.S. Sedha, "A Text book of Applied Electronics", 7th edition. S. Chand	and						
	Company Ltd. 2011							
	(7) Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)							
	(8) Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7	7th Ed.,						
	2011. Tata McGraw							
	(9) Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Lea	arning Pvt						
	Ltd.							
	(10) Digital Circuits and systems Venugonal 2011 Tata McGraw Hill							
	(11) Digital Systems: Principles & Applications R I Tocci N S Widmer	2001 PHI						
	Learning	2001, 1111						
	(12) Digital Electronics S.K. Mandal 2010 1st edition McGraw Hill							
	(12) Digital Electronics, S.K. Wandar, 2010, 1st cutton, Weolaw IIII							

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Laboratory Experiments:

Year	Ι	Course Code: 126BSC02ELEDSC02L	Credits	2
Sem	1	Course Title: ANALOG AND DIGITAL ELECTRONICS	Hours	4
Jem.	1	(Hardware and Circuit Simulation Software)	liouis	Hrs/week
Format	ive As	sessment Marks: 25 Summative Assessment Marks:25 Duratio	n of ESA:	4 hrs.
Sl. No		Experiment		
		PART A (Any Five)		
1		Study of JFET characteristics – determination of parameters.		
2		Study of MOSFET characteristics – determination of parameters.		
3		UJT characteristics and relaxation oscillator		
4		SCR characteristics – determination of Holding current and firing vogate currents.	oltage for d	ifferent
5		Design of inverting amplifier using Op-amp & study the frequency r	esponse.	
6		Design of non-inverting amplifier using Op-amp & study the frequent	ncy respon	se.
7		Op-amp as a adder and subtractor.		
		Design and study of differentiator using op-amp for different input v	vaveforms.	
8		Design and study of integrator using op-amp for different input wave	eforms.	
9		Design and study of first order low-pass filters using op-amp.		
10		Design and study of first order high-pass filters using op-amp.		
11		Astable multivibrator using IC-555 timer.		
12		Monostable multivibrator using IC-555 timer.		
		PART B (Any Five)		
13		Half Adder and Full Adder using logic gates		
14		Half Subtractor and Full Subtractor logic gates		
15		Study of the Encoders and priority encoders.		
16		Study of Multiplexer using logic gates.		
17		Study of Demultiplexer using logic gates.		
18		Study of 2-bit and 4-bit magnitude comparators.		
19		Study of Clocked RS, D and JK Flip-Flops using NAND gates.		
20		Study of 4-bit Shift Register – SISO, modification to ring counter usi	ng IC 7493	5.

OPEN ELECTIVE

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Year	Ι	Course Code: 126BSC02ELEOEC02T Cre							
Sem.	1	Course Title: Ele	Course Title: Electronics for Everyone Hou						
Course Pr	e-requi	sites, if any	NA						
Formative	e Asses	sment Marks: 40	Summative Assessment Marks: 60	Duration	of ESA:	2 hrs.			
Unit No.			Course Content		H	ours			
		Timer (IC 555):	Introduction, Block diagram, Astable and	Monostal	ole				
TT •4 T		multivibrator circ	uits and its application	1	, 1	0			
Unit-I		Phase Locked L	oop (PLL): Functional block diagram – Pha	ise detecto	r/ I	U			
	etection								
		Operational An	unlifier: Introduction to Differential Am	lifier Bl	ock				
		diagram of Op-A	mp Schematic symbol. Equivalent circuit	for ideal	on-				
		amp. ideal volta	ge transfer curve. Characteristics Op-An	np. Op-A	mp 1	0			
TT •4 TT		parameters, Op-A	mp configurations (Open and closed loop co	onfiguratio	n),				
Unit-II		Concept of Virtua	al Ground.	U					
		Op-Amp Applic	ations: Inverting and non-inverting amplifi	er, Summ	ing				
		Amplifier, Difference Amplifier, Integrator, Differentiator, Instrumentation							
		Amplifier, Phase-	shift and Wein bridge oscillator.	<u> </u>					
		Transducers (B	Basic Working): Introduction, types of	t transdu	cer,				
		Types Gauge I	Easter bridge circuits Semiconductor	un Gauge	s - I	,			
		Capacitive (diaph	ragm) Hall effect sensors Magneto- strictiv	vetransduc	ers				
Unit -III		Microphone. To	uch Switch. Piezoelectric sensors. Opto	b- Electro	onic				
		transducer (Photo	conductive or LDR, Photo emissive, Photo	voltaic,					
		Semiconductor Pl	hoto diode, Photo transistor), Temperature s	ensor					
		(electrical and nor	n-electrical), Pressure sensor.						
		Data Acquisiti	on using Arduino: ArduinoBirth,	Open-Sou	irce				
		community, Functional Block Diagram, Functions of each Pin, Arduino							
Unit -IV		Development Boards: IDE, I/O Functions, Looping Techniques, Decision							
		Making Techniques, Designing of 1st sketch, Programming of an Arduino							
		(Arounio ISP), Serial port interfacing, Basic interfacing and I/O Concept, Interfacing I ED Switch 7seg I ED different sensors							
		1. Study of basic N	Anostable / Astable multivibrator.						
		2. Light detection	using 555 timers.						
		3. Study of basic in	nverting and non-inverting amplifier.						
Laborato	ry	4. Study of basic i	ntegrator / differentiator circuit.						
Demonst	ration	5. Test the differe	nt Arduino Boards, Open-Source and Arduin	10					
		Shields.							
	6. Install Arduno IDE and its development tool.								
7. Develop a program to BINK LED for isecond. 8. Interfacing of various sensors with Arduino development board									
		R	ecommended Leaning Resources						
Reference	;	1.R.P. Bali, Const	umer Electronics, Pearson Education (2008)						
Books		2.R.G. Gupta, Au	dio and Video systems, Tata McGraw Hill (2	2004)					

ASSESSMENT METHODS

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2 nd Internal Assessment Test for 30 marks 1 hr after 15 weeks. Average of two tests should be considered.	30
Assignment	05
Activity	05
Total	40

Assessment Criteria	25 marks
1 st Internal Assessment Test for 20 marks 1 hr after 8 weeks and 2 nd Internal Assessment Test for 20 marks 1 hr after 15 weeks. Average of two tests should be considered.	20
Assignment/Activity	05
Total	25

Practical:

Assessment Criteria	25 marks
Internal test	15
Viva Voce / basic understanding of the concept	05
Journal/Practical Record	05
Total	25

Scheme of Evaluation for Practical Examination

Sl. No.	Particulars	Marks Allotted Max. 25
1.	Basic formula with description, nature of graph if any & indication of unit	05
2.	Tracing of schematic ray diagram/Circuit diagram with description and tabulation	05
4.	Experimental skill & connection	05
5.	Record of observation,	05
6.	Calculation including drawing graph	04
7.	Result with unit	01
	Total	25

Question Paper Pattern: ELECTRONICS

I /II Semester B.Sc.

Sub:	Code: Maxim	Maximum Marks: 60		
Q.No.1.	Answer any Six Questions (<i>Two question from Each Unit to asked</i>)	<i>be</i> 6X2=12		
	a. b.			
	с.			
	d,			
	e.			
	f.			
	8. h.			
O.No.2.	(Questions from Unit-I)			
	a.	08		
	b.	04		
	OR			
	c.	08		
		04		
Q.No.3.	(Questions from Entire Unit-II)	08		
	a. b	08		
	OR	04		
	с.	08		
	d.	04		
Q.No.4.	(Questions from Unit-III)			
	a.	08		
	b.	04		
	OR	08		
	c. d	08		
O.No.5.	(Ouestions from Unit-IV)			
	a.	08		
	b.	04		
	OR			
	c.	08		
	d.	04		

Note:

i. There should be a problem of marks from each unit and may be asked in either b or d in questions 2 to 5.

ii. If necessary, sub questions a and c from 2 to 5 may be subdivided in to i. and ii. Without exceeding maximum 08 marks.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

STATISTICS

FIRST AND SECOND SEMESTER SYLLAB

As per NEP 2020 and adapted from RCU Belagavi

applicable from the

Academic Year 2023-24

STATISTICS:

Credits Structure under Choice Based Credit System [CBCS] of Statistics Major & One Minor Discipline Scheme for the Threeyear/ Four Years Statistics B.Sc. /B.Sc. Honors Programme with effect from 2023-24

SEMESTER-I										
Catego	Course code	Title of the	Marks			Teaching hours/week			Credi	Durationn of exams
ry	Course code	Paper	IA	SEE	Total	L	Т	Р	t	(Hrs)
DSC1	126BSC01STSDSC01T	Descriptive Statistics	40	60	100	4	-	-	4	2
	126BSC01STSDSC01L	Practical Course II	25	25	50	-	-	4	2	4
	126BSC01STSOEC01 T	Statistical Methods								
OEC1			40	60	100	3		-	3	2

	SEMESTE R-II									
Category	Course code		Marks			Teaching hours/wee k			Cred	Durationn of exams
		ineraper	IA	SE	Tot	L	Т	Р	It	(Hrs)
				Ε	al					
	126BSC02STSDSC02T	Probability								
DSC2		and	40	60	10	4	-	-	4	2
DSC2		Distributions			0					
	126BSC02STSDSC02L	Practical	25	25	50	-	-	4	2	4
		Course II								
OEC 2	126BSC02STSOEC0 2T	Business Statistics	40	60	10 0	3	-	-	3	2

COURSE-WISE SYLLABUS

Semester - I

Course Title: Descriptive Statistics	
Total Contact Hours: 56	Course Credits:04
Formative Assessment Marks: 40	Duration of ESA/Exam: 2 hours
	Summative Assessment Marks: 60

Title of the Course: Descriptive Statistics

Number of Theory Credits	Imber of ory CreditsNumber of lectureNumber of practicalNumber of 					
	hours/semester	Credits	hours/semester			
4	56	2	52			
	Content of 7	Theory Course1		56 Hrs		
Unit – 1 : Introduction to Statistics						
Statistics: Definition and scope. Concepts of statistical population and sample (SRS,Stratified, Systematic and Cluster sampling methods Definitions only). Data: quantitative and qualitative, cross sectional and time-series, discrete and continuous. Scales of measurement: nominal, ordinal, interval and ratio. Presentation of data: tabular and graphical. Frequency distributions, cumulative frequency distributions and their graphical representations. Stem and leaf displays. (Ref. 4)						
Unit – 2: Univariate Da	ta Analysis			14 Hrs		
Measures of Central Tendency: Mean, weighted mean, Median, Mode, Geometric and harmonic means, properties, merits and limitations, relation between these measures. Measures of Dispersion: Range, Quartile deviation, Mean deviation, Standard deviation and their relative measures. Gini's Coefficient, Lorenz Curve. Moments, Skewness and Kurtosis. Quantiles and measures based on them. Box Plot. Outliers. normal data sets. (Ref.10).						
Unit – 3: Bivariate Dat	ta Analysis			14 Hrs		
Bivariate Data, Scatter plot, Correlation, Karl Pearson's correlation coefficient, Rank correlation – Spearman's and Kendall's measures. Concept of errors, Principle of least squares, fitting of polynomial and exponential curves. Simple linear regression and its properties. Fitting of linear regression line and coefficient of determination. (Ref. 10)						
Unit –4: Multivariate I	Data Analysis			14 Hrs		

References

Analysis of Categorical Data: Contingency table, independence and association of attributes, measures of association - odds ratio, Pearson's and Yule's measure, Multivariate Frequencies, Multivariate Data Visualization, mean vector and dispersion matrix, Multiple linear regression, multiple and partial correlation coefficients. Residual error variance. (Ref. 7)

- 1. Agresti, A. (2010): Analysis of Ordinal Categorical Data, 2nd Edition, Wiley.
- 2. Anderson T.W. and Jeremy D. Finn (1996). The New Statistical Analysis ofData,Springer
- 3. Freedman, D., Pisani, R. and Purves, R. (2014), Statistics, 4th Edition, W. W. Norton&Company.
- 4. Gupta, S.C. (2018), Fundamental of Statistics, Himalaya Publishing House, 7th Edition.
- 5. Gupta S.C. and V.K. Kapoor (2020), Fundamental of Mathematical Statistics, SultanChand and Co. 12th Edition.
- 6. Hogg, R. V. McKean J. W. and Craig, A. T. (2012), Introduction toMathematicalStatistics, Pearson 7th Edition.
- 7. Joao Mendes Moreira, Andre C P L F de Carvalho, Tomas Horvath (2018), GeneralIntroduction to Data Analytics, Wiley.
- 8. Johnson, R.A. and Bhattacharyya, G.K. (2006), Statistics: Principles and methods.5thEdition, John Wiley & Sons, New York.
- 9. Medhi, J. (2005), Statistical Methods, New Age International.
- 10. Ross, S.M. (2014), Introduction to Probability and Statistics for Engineers andScientists, 5th Edition, Academic Press.
- 11. Tukey, J.W. (1977), Exploratory Data Analysis, Addison-Wesley Publishing Co.

Year	Ι	Course Code: 126BSC01STSDSC01L	Credits	02
Sem.	Ι		Hours	45
		Course Title: Practical Course - I		
Course Pre-requisites, if any:		Knowledge of Excel		
Formative Assessment Marks: 25		Summative Assessment Marks: 25	Duration of ESA:	03 hrs.

Content of Practical Course - I

(Computing all the practicals manually and using Excel)

- 1. Presentation of data by frequency tables, diagrams and graphs, stem and leaf,partition values.
- 2. Arithmetic Mean (AM), geometric mean, harmonic mean, weighted AM, correctedmean.
- 3. Mode, median, partition values.
- 4. Absolute and relative measures of dispersion, Box plots.
- 5. Problems on moments, skewness and kurtosis.
- 6. Fitting of curves by least squares method
- 7. Product moment correlation coefficient and rank correlation.
- 8. Regression of two variables.
- 9. Multivariate Descriptive statistics, mean Vector, dispersion matrix correlationmatrix, Partial and Multiple correlation.
- 10. Problems on Association of attributes.

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2 nd Internal Assessment Test for 30 marks 1 hr after 15 weeks . Averageof two tests should be considered.	30
Assignment	10
Total	40

Assessment Criteria	25 marks
1 st Internal Assessment Test for 20 marks 1 hr after 8 weeks and 2 nd	20
Internal Assessment Test for 20 marks 1 hr after 15 weeks . Average of two	
tests should be considered.	
Assignment	05
Total	25

Practical:

Assessment Criteria	25 marks
Semester End Internal Assessment Test for 20 marks 2 hrs	20
Journal (Practical Record)	05
Total	25

Statistics

I Semester B.Sc Statistics

Maximum Marks:	Code:) :	
b. Answer any Three	Answer any Six Questions from Question 1	a.	
	each Questions from Question 2,3,4 and 5		

Q.No.1.	Answer any Six Questions (At least Two question from EachUnit)	2X6=12
	a.	
	b.	
	c.	
	d,	
	e.	
	f.	
	g.	
	h.	
O No 2	(Should cover Entire Unit-I)a.	4X3=15
2	b.	
	с.	
	d.	
	(Charled comer Ending Haid Ha)-	4772 4 8
Q.No.3.	(Snouid cover Entire Unit-11)a.	4X3=15
	D.	
	c.	
	d.	
Q.No.4.	(Should cover Entire Unit-III)	4X3=15
	a.	
	b.	
	с.	
	d.	
Q.No.5.	(Should cover Entire Unit-IV) a.	4X3=15
	b.	
	с.	
	d.	
1		

Statistical Methods (Open Elective)

Year I Course Code: 126BSC01STSOEC01T Course Title: Statistical Methods		Credits	03			
Sem.	1	1 Course The: Statistical Methods		Hours	40	
Course	Pre-r	equisites, if any	NA			
Formative Assessment Marks: 40 S		ssessment Marks: 40	Summative Assessment Marks: 60	Duration o	f ESA:.02	hrs.

Course Objectives

- 1. This is an open elective course for other than statistics students.
- 2. The students will learn the elements of descriptive statistics, probability, statistical methods such as tests of hypotheses, correlation and regression.

Course Outcomes

Students will be able to;

- CO1. Acquire knowledge of statistical methods.
- CO2. Identify types of data and visualization, analysis and interpretation.
- CO3. Know about elementary probability and probability models.
- CO4. Employ suitable test procedures for given data set.

Contents

Unit 1: Introduction

10 Hours

Definition and scope of Statistics. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Presentation: tabular and graphic, including histogram and ogives. Concepts of statistical population and sample. Sampling from finite population - Simple random sampling, Stratified and systematic random sampling procedures (definitions and methods only). Concepts of sampling andnon-sampling errors.

Unit 2: Univariate and Bivariate Data Analysis 10 Hours

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.

Bivariate data, scatter diagram, Correlation, Karl-Pearson's correlation coefficient, Rank correlation. Simple linear regression, principle of least squares and fitting of polynomialsand exponential curves.

Unit 3: Probability and Distributions 10 Hours

Probability: Random experiment, trial, sample space, events-mutually exclusive and exhaustive events. Classical, statistical and axiomatic definitions of probability, addition and multiplication theorems, Bayes theorem (only statements). Discrete and continuous random variables, probability mass and density functions, distribution functions, expectation of a random variable.

Standard univariate distributions: Binomial, Poisson and Normal distributions (Elementaryproperties and applications only).

Unit 4: Sampling Distributions and Testing of Hypothesis 10 Hours

Distribution of sample mean from a normal population, Chi-square, t and F distributions (No derivations) and their applications.

Statistical Hypothesis – null and alternative hypothesis, simple and composite hypothesis.Type I and Type II errors, level of significance, critical region, P-value and its interpretation. Test for single mean, equality of two means, single variance, and equality of two variances for normal populations.

References

- 1. Daniel, W. W. (2007 Biostatistics A Foundation for Analysis in the Health Sciences, Wiley
- 2. T.W. Anderson and Jeremy D. Finn(1996). The New Statistical Analysis of Data, Springer.
- 3. Mukhyopadyaya P(1999). Applied Statistics, New Central book Agency, Calcutta.
- 4. Ross, S.M.(2014) Introduction to Probability and Statistics For Engineers and Scientists.
- 5. Cochran, W G (1984): Sampling Techniques, Wiley Eastern, New Delhi.

B.Sc. Semester-II

Course Title: Probability and Distributions		
Total Contact Hours: 56	Course Credits:04	
Formative Assessment Marks: 40	Duration of ESA/Exam: 2hours	
	Summative Assessment Marks: 60	

Course Pre-requisite(s): II PUC with Mathematics Title of the Course: Probability and Distributions

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours/semester		
4	56	2	52		
	Content of Theory Course 2				
Unit –1 : Probabilit	У			14 Hrs	
Random experiment, sample space and events, algebra of events. Definitions of Probability-Classical, statistical, subjective and axiomatic approaches – illustrations and applications, Addition rule, Conditional probability, independence of events and multiplicationrule, Totalprobability rule, Bayes theorem- applications.					
Unit -2: Random Variables And Mathematical Expectation-(One Dimension)					
Definitions of discrete and continuous random variables, Distribution function, probability mass and density functions – properties and illustrations, Expectation of a random variable and rules of expectation and related results, Moments and moment generating function – properties and uses.					
Unit –3 : Standard Distributions					
Bernoulli, Binomial relations for proba distribution and its p	l, Poisson, distributions bilities and moments properties.	s– mean, variance, mo of Binomial and Po	ments and m. g. f. recursive bisson distributions, Norma		

Unit –4: Data Analysis Using R	14 Hrs
Introduction to R: Installation, command line environment, overview of capabilities, brief mention of open source philosophy. R as a calculator: The four basic arithmetic operations. Use of parentheses nesting up to arbitrary level. The power operation. Evaluation of simple expressions. Quotient and remainder operations for integers. Standard functions, e.g., sin, cos, exp, log. The different types of numbers in R: Division by zero leading to Inf or -Inf. NaN. NA.No need to go into details. Variables. Creating avector using c(), seq() and colon operator. Howfunctions map over vectors. Functionsto summarize a vector: sum, mean, sd, median etc. Extracting a subset from the vector (by index, by property). R as a graphing calculator: Introduction to plotting. Plot(), lines(), abline(). No details about the graphics parameters exceptcolour and line width.	
- Barnlot Pie chart and Histogram Roy plot Scatter plot and simple linear regression using	

Barplot, Pie chart and Histogram. Box plot. Scatter plot and simple linear regression using $lm(y \sim x)$. Problems on discrete and continuous probability distributions.

References

- 1. Dudewitz. E.J. and Mishra. S. N. (1998), Modern Mathematical Statistics. John Wiley.
- 2. Goon A.M., Gupta M.K., Das Gupta .B. (1991), Fundamentals of Statistics, Vol. I, World Press, Calcutta.
- Gupta. S.C and V.K. Kapoor (2020), Fundamentals of Mathematical Statistics, SultanChand and Co, 12th Edition.
- 4. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009), Probability and Statistical Inference, Seventh Edition, Pearson Education, New Delhi.
- 5. Mood, A.M., Graybill, F.A. and Boes, D.C. (2007), Introduction to the Theory ofStatistics, 3rd Edition. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
- 6. Ross, S. (2002), A First Course in Probability, Prentice Hall.
- 7. Sudha G. Purohit, Sharad D. Gore, Shailaja R Deshmukh,(2009), Statistics Using R,Narosa Publishing House.
- 8. Rfor beginners by Emmanuel Paradis (freely available at <u>https://cran.r-project.org/doc/contrib/Paradisrdebuts_en.pdf</u>)

Year	Ι	Course Code: 126BSC02STSDSC02L	Credits	02
Sem.	II	Course Title: Practical Course - II	Hours	45
Course Pre-requisites, if any:		Knowledge of Excel and R		
Formative Assessment Marks: 25		Summative Assessment Marks: 25	25 Duration of ESA: 03 hrs.	

Content of Practical Course 2: List of Experiments to be conducted

(Computing all the practicals manually and using Excel/R)

1. Two exercise on Descriptive statistics (Presentations,

Summarizations, correlations, regression and Graphs using

R)

- 2. Computing probability: using addition and multiplication theorems.
- 3. Conditional probability and Bayes' theorem.
- 4. Problems on pmf, expectation, variance, quantiles, skewness, kurtosis (Discrete Case).
- 5. Problems on pdf, expectation, variance, quantiles, skewness, kurtosis (Continuous case).
- 6. Problems on discrete probability distributions(Binomial and Poisson)
- 7. Problems on Normal probability distributions
- Computation of moments and Moment generating functions (Discrete and Continuous Case).
- 9. Fitting of distributions Binomial, Poisson, Normal distributions.
- 10. Generation of random samples. (Binomial, Poisson, Normal)

Year	Ι	Course Code: 126BSC02STSOEC02T		Credits	03	
Sem.	II	Course Title: Business Statistics		Hours	40	
Course	Pre-re	equisites, if any	NA			
Formative Assessment Marks: 40 Summative Assessment Marks: 60 Duration of ESA:.0		f ESA:.02 l	hrs.			

2. Business Statistics (Open Elective)

Course Objectives

- 1. Provide an introduction to basics of statistics within a financial context.
- 2. To enable students to use statistical techniques for analysis and interpretation of business data.

Course Outcomes (CO)

Upon the completion of this course students should be able to:

CO1.Frame and formulate management decision problems.

CO2. Understand the basic concepts underlying quantitative analysis.

CO3. Use sound judgment in the applications of quantitative methods to management decisions.

Pedagogy

1. The course is taught using traditional chalk and talk method using problem solving through examples and exercises.

2. Students are encouraged to use resources available on open sources.

Contents

Unit 1: Statistical Data and Descriptive Statistics

Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross- sectional data. Measures of Central Tendency: mathematical averages including arithmetic mean geometric mean and harmonic mean, properties and applications. Positional Averages Mode and Median (and other partition values including quartiles, deciles, and percentiles). Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis.

Unit 2: Simple Correlation and Regression Analysis

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (Proof not required). Correlation and Probable error; Rank Correlation.

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate and its use in interpreting the results.

Unit 3: Index Numbers

10 Hours

Definition, Problems involved in the construction of index numbers, methods of constructing index numbers of prices and quantities, simple aggregate and price relatives method, weighted aggregate and weighted average of relatives method, important types of weighted index numbers: Laspeyre's, Paasche's, Bowley's, Marshall-Edge worth, Fisher's, method of obtaining price and quantity index numbers, tests consistency of index numbers, time reversal test and factor reversal test for index numbers, Uses and limitations of index numbers. Consumer price index number:

10 Hours

10 Hours

Problems involved in the construction of cost of living index number, advantages and disadvantages, Aggregative expenditure method and Family budget method for the construction of consumer price index numbers. Applications of Cost of Living Index numbers. Definition and measurement of Inflation rate – CPI and GNP Deflator.

Unit 4: Time Series Analysis

10 Hours

Introduction, definition and components of Time series, illustrations, Additive, Multiplicative and mixed models, analysis of time series, methods of studying time series: Secular trend, method of moving averages, least squares method – linear,quadratic, exponential trend fittings to the data. Seasonal variation - definition, illustrations, measurements, simple average method, ratio to moving average method, ratio of trend method, link relatives method, Cyclical variation- definition, distinction from seasonal variation, Irregular variation- definition, illustrations.

References

- Levin, Richard, David S. Rubin, Sanjay Rastogi, and H M Siddiqui.
 Statistics for Management. 7th ed., Pearson Education.
- David M. Levine, Mark L. Berenson, Timothy C. Krehbiel, P. K.Viswanathan, Business Statistics: A First Course, Pearson Education.
- 3. Siegel Andrew F. Practical Business Statistics. McGraw Hill Education.
- 4. Gupta, S.P., and Archana Agarwal. Business Statistics, Sultan Chand and Sons, New Delhi.
- 5. Vohra N. D., Business Statistics, McGraw Hill Education.
- 6. Murray R Spiegel, Larry J. Stephens, Narinder Kumar. Statistics (Schaum's Outline Series), Mc-Graw Hill Education.
- 7. Gupta, S.C. Fundamentals of Statistics. Himalaya Publishing House.
- 8. Anderson, Sweeney, and Williams, Statistics for Students of Economics and Business, Cengage Learning.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301 DIST: BAGALKOTE

BIOTECTNOLOGY

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi

Applicable from the

Academic Year 2023-24

BIOTECHNOLOGY

Credits Structure under Choice Based Credit System [CBCS] of Biotechnology Major& One Minor Discipline Scheme for the Three Years/ Four Years B.Sc. /B.Sc.(Honors)Programme with effect from 2023-24

SEMESTER-I										
Catego	Course code	Title of the Paper	Marks		Teaching		ng	Credi	Duration	
ry						hours/week			t	of exams
			IA	SE	Tot	L	Т	Р		(Hrs)
				Ε	al					
DSC1	126BSC01BITDSC0	Cell Biology and	40	60	100	4	-	-	4	2
	11	Genetics								
	126BSC01BITDSC0	Cell Biology and	25	25	50	-	-	4	2	4
	1L	Genetics lab								
OEC1	126BSC01BITOEC	Biotechnology for	40	60	100	3	-	-	3	2
	011	Human welfare								

********Exit option with certificate (50 credits)

SEMESTER-II										
Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credi t	Duration of exams (Hrs)
			IA	SE E	Tot al	L	Τ	Р		(1115)
DSC2	126BSC02BITD SC02T	Microbiological methods & Techniques	40	60	100	4	-	-	4	2
	126BSC02BITD SC02L	Microbiological methods & Techniques lab	25	25	50	-	-	4	2	4
OEC2	126BSC02BIT OEC02T	Applications of Biotechnology in Agriculture	40	60	100	3	-	-	3	2

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
 1st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2nd Internal Assessment Test for 30 marks 1 hr after 15 weeks . Average of two tests should be considered. 	30
Assignment/viva	10
Total	40

Assessment Criteria	25 marks
 1st Internal Assessment Test for20 marks 1 hr after 8 weeks and 2nd Internal Assessment Test for 20 marks 1 hr after 15 weeks . Average of two tests should be considered. 	20
Assignment	05
Total	25

Practical:

Assessment Criteria	25 marks
Semester End Internal Assessment Test for 7 marks 2 hrs	20
Journal (Practical Record)	05
Total	25

Question Paper Pattern:

Duration: 2 hr I Semester B.Sc (Biotechnology)

Sub:

a.

Code:

Maximum Marks: 60

Answer any SIX Questions from Question 1

b. b. Answer any Three each Questions from Question 2,3,4 and 5

Q.No.1.	Answer any SIX Questions (Two question from Each Unit)	2X6=12
	a.	
	b.	
	с.	
	d,	
	е.	
	f.	
	g.	
	h.	
Q.No.2.	(Should cover Entire Unit-I)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.3.	(Should cover Entire Unit-II)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.4.	(Should cover Entire Unit-III)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.5.	(Should cover Entire Unit-IV)	4X3=12
	a.	
	b.	
	c.	
	d.	

BSc (Hons) Biotechnology-Semester 1 Title of the Course: DSC-1: Subject code: 126BSC01BITDSC01T Paper: Cell Biology and Genetics

Number of Theory (Credits	Number of lecture hours/ semester	Number of practical credits	Number of practical hours / semesters			
4		56	2	56			
Unit No.		Co	ourse Content		Hours		
	Cell as a	Basic unit of Livi	ng Systems and C	Cellular Organelles	14		
	Concept,	Development and	Scope of Biotechn	ology. Historical			
	perspectiv	ves. Discovery of c	cell, the cell Theor	y, Ultra structure of a			
	eukaryoti	c cell- (Both plant	and animal cells),				
	Surface A	Architecture: Stru	ctural organization	n and functions of			
T T •/ T	plasma m	embrane and cell v	wall of eukaryotes.				
Unit I	Cellular	Organelles: Struct	ture and functions	of cell organelles –			
	Endoplas	mic reticulum, Gol	gi complex, Mitoc	hondria, Chloroplast,			
	Ribosomes, Lysosomes, Peroxisomes, Nucleus (Nuclear envelope						
	with nuclear pore complex, Nucleolus, Nucleoplasm and						
	Chromatin). Vacuole, Cytosol and Cytoskeleton structures						
	(Microtub	oules, Microfilame	nts and Intermedia	te filaments).			
	Chromos	somes and Cell Di	vision		14		
	General	Introduction, Di	scovery, Morpho	logy and structural			
	organizati	ion – Centromer	e, Secondary co	nstriction, Telomere,			
	Chromonema, Euchromatin and Heterochromatin, Chemical						
	composition and Karyotype. Single-stranded and multi-stranded						
	hypothesis	hypothesis, folded- fibre and nucleosome models.					
Unit II	Special t	ype of chromoso	mes: Salivary gla	and and Lamp brush			
	chromosmes.						
	Cell Divis	sion: Cell cycle, p	hases cell division	. Mitosis and meiosis,			
	regulation	regulation of cell cycles cell cycle checkpoints, and enzymes					
	involved i	in regulation, Signi	ficance of cell cyc	le, mitosis and meiosis			
	interphase	e nucleus, achroma	atic apparatus, syn	aptonemal			
	complex	Cell Cycle and	regulation, mitos	is and meiosis.Cell			

	Senescence and programmed cell death.	
	Genetics:	14
	History of genetics: Introduction and brief history of genetics.	
	Mendelian theory: Laws of inheritance- dominance, segregation,	
	incomplete dominance, codominance with an example. Law of	
	independent assortment, test cross, back cross. Deviations to	
	Mendelian inheritance, complementary, supplementary and	
Unit III	interaction of genes (13:3 ratio), epistasis.	
0	Maternal Inheritance: Plastid inheritance in Mirabilis, Petite	
	characters in yeast and Kappa particles in paramecium, Sex-linked	
	inheritance, Chromosome theory of inheritance.	
	Gene interaction: Supplementary factors: comb pattern in fowls,	
	Complementary genes- Flower colour in sweet peas, Multiple	
	factors-Skin colour in human beings, Epistasis- Plumage colour in	
	poultry, Multiple allelism: Blood groups in Human beings.	
	Unit 4 Linkaga and Crossing Over	1.4
	Unit-4.Linkage and Crossing Over	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance,	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize.	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. Mutations: Types of mutations, Spontaneous and induced, Mutagens:	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. Mutations: Types of mutations, Spontaneous and induced, Mutagens: Physical and chemical, Mutation at the molecular level, Mutations in	14
	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. Mutations: Types of mutations, Spontaneous and induced, Mutagens: Physical and chemical, Mutation at the molecular level, Mutations in plants, animals and microbes for economic benefit of man.	14
Unit IV	Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. Mutations: Types of mutations, Spontaneous and induced, Mutagens: Physical and chemical, Mutation at the molecular level, Mutations in plants, animals and microbes for economic benefit of man. Chromosomal variations: A general account of structural and	14
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Unit IV	 Introduction, Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. Mutations: Types of mutations, Spontaneous and induced, Mutagens: Physical and chemical, Mutation at the molecular level, Mutations in plants, animals and microbes for economic benefit of man. Chromosomal variations: A general account of structural and numerical aberrations ,chromosomal evolution of wheat and cotton. Sex Determination in Plants and animals: Concept of all osomes and autosomes, XX- XY, XX-XO, ZW-ZZ, ZO-ZZ types. Human Genetics: Karyotype in man, inherited disorders – Allosomal (Klinefelter syndrome and Turner"ssyndrome), Autosomal (Down syndrome and Cri-Du-Chat Syndrome). 	14

Semester-I; Course : Practical

Paper : Cell Biology and Genetics; Paper Code: 126BSC01BITDSC01L

Study and maintenance of simple and compound microscope

- 1) Use of Micrometer and calibration, measurement of onion epidermal cells and yeast
- 2) Study of divisional stages in mitosis from onion root tips
- 3) Study of divisional stages in meiosis in grasshopper testes/onion orRhoeo flower buds.
- 4) Mounting of polytene chromosomes
- 5) Buccal smear Barr bodies
- 6) Karyotype analysis Human and Onion Human – Normal and Abnormal – Down and Turner^{**}s syndromes
- 7) Isolation and staining of Mitochondria
- 8) Isolation and staining of Chloroplast
- 9) RBC cell count by Haemocytometer
- 10) Simple genetic problems based on theory
- Each student is required to submit 5 permanent slides of mitosis & meiosis

Text Books / References

Reference:

- 1. Molecular Biology of Cell Bruce Alberts et al, Garland publications.
- 2. Animal Cytology and Evolution- MJD, White Cambridge University Publications
- 3. Molecular Cell Biology-Daniel, Scientific American Books
- 4. Cell Biology Jack d Bruke, The William Twilkins Company
- 5. Principles of Gene Manipulations- Old & Primrose, Black Well Scientific Publications
- 6. Cell Biology-Ambrose & Dorothy M Easty, ELBS Publications
- 7. Fundamentals of Cytology- L. W. Sharp, McGraw Hill Company
- 8. Cytology-Willson&Marrison, Reinform Publications
- 9. Molecular Biology- Christopher Smith, Faber & Faber Publications
- 10. Cell Biology & Molecular Biology EDP De Robertis& EMF Robertis, Saunder College.
- 11. Cell Biology- C.B Powar, Himalaya Publications
- 12. Basic Genetics- Daniel L. Hartl, Jones & Barlett Publishers USA
- 13. Human Genetics and Medicine lark Edward Arnold P London
- 14. Genetics Monroe W Strickberger, Macmillain Publishers, New York
- 15. Genes V Benjamin Lewin, Oxford University Press.
- 16. Genes I Benjamin Lewin, Wiley Eastern Ltd., Delhi
- 17. Genes II Benjamin Lewin, Wiley & Sons Publications
- 18. Genes III- Benjamin Lewin, Wiley & Sons Publications

OPEN-ELECTIVE SYLLABUS:

BSc Semester 1 – B.Sc (Hons) Biotechnology Title of the Course: Open Elective (OE-1): Biotechnology for Human Welfare Course code: 126BSC01BITOEC01T

Courses	Credits	No. of Classes/We ek	Total No. of Lectures/ Hours	Duration of Exam in hrs	Internal Assessment Marks	Semester End Exam Marks	Total Marks
Theory	03	03	42	2	40	60	100

Unit No.	Course Content	Hours
Unit I	Industry Application of biotechnology in industry: Industrial production of alcoholic beverage (wine), antibiotic (Penicillin), enzyme (lipase) Protein engineering applications in food , detergent and pharmaceutical industry	14
Unit II	Environment Application of biotechnology in environmental aspects : Degradation organic pollutants - chlorinated and non- chlorinated compounds; degradation of hydrocarbons and agricultural wastes, PHB –production and its futuristic applications	14
Unit III	Forensic science Application of biotechnology in forensic science: Solving crimes of murder and rape; solving claims of paternity and theft by using DNA finger printing techniques Health Application of biotechnology in health: Genetically engineered insulin, recombinant vaccines, gene therapy, molecular diagnostics using ELISA, PCR; monoclonal antibodies and their use in cancer; human genome project	14

Reference:

- 1. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology.2nd edition. Panima Publishing Co. New Delhi.
- 2. Patel AH. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited.
- Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
- 4. Environmental Biotechnology, Pradipta Kumar Mohapatra

- 5. Environmental Biotechnology Concepts and Applications, Hans-Joachim Jordening and Jesef Winter
- 6. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
- 7. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
- 8. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
- 9. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G.Eckert (ED.), CRC Press, Boca Raton (1997).

BSc (Hons) Biotechnology- Semester 2 Title of the Course: DSC-2: Subject code: 126BSC02BITDSC02T Paper: Microbiological Methods

Number of	Number of lecture	Number of	Number of practical
Theory Credits	hrs./semester	practical Credits	hrs./ Sem
4	56	2	56

Unit No.	Course Content	Hours
Unit I	Instruments used in BiotechnologyMicroscopy: Principles of Microscopy- resolving power, numerical aperture, working principle and applications of Compound microscope, Dark field microscope, Phase contrast microscope, Fluorescence Microscope, confocal microscope, Electron Microscopes- TEM and SEM.Analytical techniques:Working principles and applications: Centrifuge, Ultracentrifuge, Spectrophotometer, Chromatography: Paper and TLC	14
Unit II	Sterilization techniques Definition of terms-sterilization, disinfectant, antiseptic, sanitizer, germicide, microbicidal agents, microbiostatic agent and antimicrobial agent. Physical methods of control: Principle, construction and applications of moist heat sterilization Boiling, Pasteurization, Fractional sterilization-Tyndallization and autoclave. Dry heat sterilization-Incineration and hot air oven. Filtration –Diatomaceous earth filter, seitz filter, membrane filter and HEPA ; Radiation : Ionizing radiation- γ rays and non-ionizing radiation- UVrays Chemical methods: Alcohol, aldehydes, phenols, halogen, metallic salts, Quaternary ammonium compounds and sterilizing gases as antimicrobial agents;	14
Unit III	Microbiological techniques Culture Media: Components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media Pure culture methods : Serial dilution and plating methods (pour, spread, streak); cultivation, maintenance and preservation/stocking of pure cultures; cultivation of anaerobic bacteria Stains and staining techniques: Principles of staining, Types of stains- simple stains, structural stains and differential stains.	14
Unit IV	Antimicrobial agents Five modes of action with one example each: Inhibitor of nucleic acid synthesis; Inhibitor of cell wall synthesis; Inhibitor of cell membrane function; Inhibitor of protein synthesis; Inhibitor of metabolism Antifungal agents: Mechanism of action of Amphotericin B,	14

Griseofulvin Antiviral agents: Mechanism of action of Amantadine, Acyclovir, Azidothymidine Antibiotic resistance, MDR, XDR, MRSA, NDM-1 Antibiotic sensitivity testing methods: Disc and Agar well diffusion techniques

Course : Practical Paper : Microbiological Methods; Paper Code: 126BSC02BITDSC02T

- 1. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology and Biotechnology laboratory.
- 2. Sterilization of medium using Autoclave and assessment for sterility
- 3. Sterilization of glassware using Hot Air Oven and assessment for sterility
- 4. Sterilization of heat sensitive material by membrane filtration and assessment for sterility
- 5. Preparation of culture media for bacteria, fungi and their cultivation.
- 6. Plating techniques: Spread plate, pour plate and streak plate.
- 7. Isolation of bacteria and fungi from soil, water and air
- 8. Study of Rhizopus, Penicillium, Aspergillus using temporary mounts
- 9. Colony characteristics study of bacteria from air exposure plate
- 10. Staining techniques: Bacteria– Gram, Negative, Capsule, Endospore staining Fungi – Lactophenol cotton blue staining
- 11. Water analysis MPN test
- 12. Biochemical Tests IMViC, Starch hydrolysis, Catalase test, Gelatin hydrolysis
- 13. Bacterial cell motility hanging drop technique

** Any two experiments given carrying 20 and 15 mark each experiment.

Text Books / References

- 1. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T. Brown Publishers.
- 2. Black JG. (2008). Microbiology: Principles and Explorations. 7th edition. Prentice Hall
- 3. Madigan MT, and Martinko JM. (2014). Brock Biology of Micro-organisms. 14th edition. Parker J. Prentice Hall International, Inc.
- 4. Pelczar Jr MJ, Chan ECS, and Krieg NR. (2004). Microbiology.
- 5. 5th edition Tata McGraw Hill.
- 6. Srivastava S and Srivastava PS. (2003). Understanding Bacteria. Kluwer Academic Publishers, Dordrecht
- 7. Stanier RY, Ingraham JL, Wheelis ML and Painter PR. (2005). General Microbiology. 5th edition McMillan.
- 8. Tortora GJ, Funke BR, and Case CL. (2008). Microbiology: An Introduction. 9th edition Pearson Education.
- 9. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

- 10. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited
- 11. Microbiology- Concepts and applications by Paul A. Ketchum, Wiley Publications
- 12. Fundamentals of Microbiology Frobisher, Saunders & Toppan Publications
- 13. Introductory Biotechnology-R.B Singh C.B.D. India (1990)
- 14. Fundamentals of Bacteriology Salley
- 15. Frontiers in Microbial technology-P.S. Bison, CBS Publishers.
- 16. Biotechnology, International Trends of perspectives A. T. Bull, G.
- 17. General Microbiology -C.B. Powar

OPEN-ELECTIVE SYLLABUS Title of the Course: OEC-2: Subject code: 126BSC02BITOEC02T Paper: Applications of Biotechnology in Agriculture B.Sc. Semester – II

		-					
Courses	Credi ts	No. of Classes/Week	Total No. of Lectures/Hour s	Duration of Exam in hrs	Internal Assessment Marks	Semester End Exam Marks	Total Mark s
Theory	03	03	42	2	40	60	100

Unit No.	Course Content					
Unit I	Agricultural BiotechnologyConcepts and scope of biotechnology in Agriculture. Plant tissueculture, micro propagation, entrepreneurship in commercial planttissue culture. Banana tissue culture - primary and secondarycommercial setups ,Small scale bioenterprises: Mushroomcultivation					
Unit II	Transgenic plantsThe GM crop debate – safety, ethics, perception and acceptance of GM cropsGM cropsGM crops case study :Bt cotton, Bt brinjal Plants as biofactories for molecular pharming : edible vaccines, plantibodies, nutraceuticals.	14				
Unit III	Bt based pesticides Baculo virus pesticides, Mycopesticides, Post-harvest Protection : Antisense RNA technology for extending shelf life of fruits and shelf life of flowers. Genetic Engineering for quality improvement: Seed storage proteins, Flavours–capsaicin, vanillin	14				

Text Books / References

- 1. Prescott, Harley, Klein"s Microbiology, J.M. Willey, L.M. Sherwood, C.J. Woolverton, 7th International, edition 2008, McGraw Hill.
- 2. Foundations in Microbiology, K. P. Talaro, 7th International edition 2009, McGraw Hill.
- 3. A Textbook of Microbiology, R. C. Dubey and D. K. Maheshwari, 1st edition, 1999, S. Chand & Company Ltd.
- 4. Brock Biology of Microorganisms, M.T.Madigan, J.M.Martinko, P. V. Dunlap, D. P. Clark- 12th edition, Pearson International edition 2009, Pearson Benjamin Cummings.
- 5. Microbiology An Introduction, G. J.Tortora, B. R.Funke, C. L. Case, 10th ed. 2008, Pearson Education.
- 6. General Microbiology, Stanier, Ingraham et al, 4th and 5th edition 1987, Macmillan education limited.
- 7. Microbiology- Concepts and Applications, PelczarJr, Chan, Krieg, International ed, McGraw Hill.

- 8. Alexopoulos, C.J., Mims, C.W., and Blackwell, M. 2002. Introductory Mycology. John Wiley and Sons (Asia) Pvt. Ltd. Singapore. 869 pp.
- 9. Atlas, R.M. 1984. Basic and practical microbiology. Mac Millan Publishers, USA. 987pp.
- 10. Black, J.G. 2008. Microbiology principles and explorations. 7edn. John Wiley and Sons Inc., New Jersey 846 pp.
- 11. Pommerville, J.C. Alcamo"s Fundamentals of Microbiology. Jones and Bartlett Pub..Sudburry, 835 pp.
- 12. Schlegel, H.G. 1995.General Microbiology. Cambridge University Press, Cambridge, 655 pp.
- 13. Toratora, G.J., Funke, B.R. and Case, C.L. 2007. Microbiology 9th ed. Pearson Education Pte. Ltd., San Francisco. 958pp.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301 dist: bagalkote MICROBIOLOGY

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi

Applicable from the

Academic Year 2023-24

MICROBIOLOGY

Proposed Curricular and Credits Structure under Choice Based Credit System [CBCS] of Microbiology Discipline Scheme for the B.Sc. Undergraduate Honors Programme with effect from 2023-24

SEMESTER-I										
Catego ry	Course code	Title of the Paper	Marks			Teaching hours/wee k			Cred	Duratio n of
			IA	SE E	Tot al	L	Т	Р	п	(Hrs)
DSC1	126BSC01MIBDSC 01T	General Microbiology	40	60	100	4	-	-	4	2
	126BSC01MIBDSC 01L	Microbiology Lab-1	25	25	50	-	-	4	2	4
OEC1	126BSC01MIBOEC 01T	Microbial Technology for Human Welfare	40	60	100	3	-	-	3	2

SEMESTER-II										
Categ ory	Commo ando	Title of the Paper	Marks			Teaching hours/wee k			Cre	Duratio n of
	Course code		IA	S E E	Tot al	L	Т	Р	dit	exams (Hrs)
DSC2	126BSC02MIBDSC0 2T	Microbial Biochemistry and Physiology	40	60	100	4	-	-	4	2
	126BSC02MIBDSC0 2L	Microbiology Lab-2	25	25	50	-	-	4	2	4
OEC2	126BSC02MIBOEC 02T	Environmental and Sanitary Microbiology	41	60	100	3	-	-	3	2
ASSESSMENT METHODS Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2 nd	30
Internal Assessment Test for 30 marks 1 hr after 15 weeks. Average of	
two tests should be considered.	
Assignment	10
Total	40

Assessment Criteria	25 marks
1 st Internal Assessment Test for 20 marks 1 hr after 8 weeks and 2 nd	20
Internal Assessment Test for 20 marks 2 hr after 15 weeks. Average of	
two tests should be considered.	
Assignment	05
Total	25

Practical:

Assessment Criteria	25 marks
Semester End Internal Assessment Test for 20 marks 2 hrs	20
Journal (Practical Record)	05
Total	25

Question Paper Pattern:

Duration: 2hrs I Semester B.Sc (Microbiology)

Sub:Code:Maximum Marks: 60

- a. Answer any Sixe Questions from Question 1
- b. Answer any Three each Questions from Question numbers 2,3,4 and 5

Q.No.1.	Answer any Six Questions (Two question from	2X6=12
	Each Unit)	
	a.	
	b.	
	с.	
	d,	
	е.	
	f.	
	g.	
	h.	
Q.No.2.	Answer any Three (Should cover Entire Unit-I)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.3.	Answer any Three (Should cover Entire Unit-II)	4X3=12
	a.	
	b.	
	с.	
	d.	
Q.No.4.	Answer any Three (Should cover Entire Unit-III)	4X3=12
	a.	
	b.	
	c.	
	d.	
Q.No.5.	Answer any Three (Should cover Entire Unit-IV)	4X3=12
	a.	
	b.	
	c.	
	d.	

BSc Microbiology (B.Sc. / Hons) Semester 1; Course code: 126BSC01MIBDS**C01T**

Course Title: General Microbiology		
Total Contact Hours: 56	Course Credits: 4+2	
Formative Assessment Marks: 40%	Duration of ESA/Exam: 2 Hrs	
Model Syllabus Authors: Curriculum Committee	Summative Assessment Marks: 60%	

Course Outcomes (COs):

At the end of the course the student should be able to:

(Write 3-7 course outcomes. Course outcomes are statements of observable student actions that serve as evidence of knowledge, skills and values acquired in this course)

1. Thorough knowledge and understanding of concepts of microbiology.

2. Learning and practicing professional skills in handling microbes.

3. Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.

Semester: I

BSc Microbiology (Basic/ Hons.)

Course code: 126BSC01MIBDSC01T

Paper title: General Microbiology

Number	Number of	Number of	Number of lecture hours/semester
of	lecture	lab Credits	
Theory	hours/semester		
Credits			
4	56	2	56

Unit – 1: Historical development, major contributions, origin of microorganisms and microscopy	14Hrs
Historical development of microbiology -Theory of spontaneous generation, Biogenesis and Abiogenesis. Contributions of Anton Von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister and Edward Jenner, Alexander Fleming, Martinus Beijirinic, Segei Winogrodsky, Elei Metechnikoff. Contributions of Indian scientists in the field of Microbiology. Fossil evidences of microorganisms. Origin of life, primitive cells and evolution of microorganisms. Microcopy- working principle, construction and operation of simple and compound microscopes.	
Unit -2 . Staining sterilization and preservation of microorganisms	14Hrs

Staining: Nature of strains, principles, mechanism, methods and types of staining- Simple, Differential-Gram staining, Acid fast staining, staining of capsule, cell wall, endospore, inclusion bodies. Sterilization: Principles, types and techniques, Physical, chemical, radiation and mechanical Preservation of microorganisms: Methods of preservation of microorganism, slant culture, stab culture, soil culture mineral oil overlaying, glycerol preservation.	
Unit – 3: Types, structure, organisation and reproduction of prokaryotic microorganisms:	14Hrs
Overview of Prokaryotic Cell Structure: Size, shape, arrangement. Diagram of Prokaryotic cell organisation, cell wall structure and Gram staining, cell membrane; Bacterial and Archaeal, Cytoplasmic matrix- Cytoskeleton, ribosome, inclusion granules: Composition and function. Nuclear Materials – Bacterial chromosomes structure (its differences with the Eukaryotic chromosome); Extra Chromosomal materials. Components external to cell wall- capsule, slime, s- layer, pilli, fimbriae, flagella; structure, motility, chemotaxis. Bacterial Endospore - Examples of spore forming organisms, habitats, function, formation and germination. Reproduction in bacteria and bacterial cell cycle.	
Unit – 4: Types, structure, organisation and reproduction of eukaryotic microorganisms	14Hrs
Over view of eukaryotic cell structure: General structure and types of cells; External cell coverings and cell membrane. Structure and function of Cytoplasmic matrix- cytoskeleton: Structure and function; single Membrane organelles- Endoplasmic reticulum, Golgi complex, Lysosomos, Vesicles and Ribosomes; Double Membrane organelles- Nucleus, Mitochondrion and Chloroplast: Structure and Functions; Peroxisomes; Organelles of motility- Structure and movement of flagella and cilia.	

Microbiology lab contents -Semester-I

Course code: 126BSC01MIBDSC01L

Title paper: General Microbiology lab

- 1. Microbiological laboratory standards and safety protocols.
- 2. Standard aseptic conditions of Microbiological laboratory.
- 3. Operation and working principles of Light/ Compound microscope.
- 4. Working principles and operations of basic equipments of microbiological laboratory(Autoclave, Oven, Incubator, pH meter, Spectrophotometer, Colorimeter, vortex, magnetic stirrer etc).
- 5. Applications of basic microbiological tools (Pipettes, Micropipette, Bunsen burner, Inoculation loop, Spreader).
- 6. Demonstration and observations of microorganisms from natural sources under lightmicroscope (Algae, Yeast and Protozoa).
- 7. Demonstration of bacterial motility by hanging drop method.
- 8. Simple staining.
- 9. Differential staining Gram staining.
- 10. Acid fast staining.
- 11. Structural staining Flagella and Capsule.
- 12. Bacterial endospore staining.
- 13. Staining of reserved food materials.
- 14. Staining of fungi by Lactophenol cotton blue.
- 15. Negative staining.

** Any two experiments given in the examinations as major and minor carries 20 + 15 marks

References

- 1. Prescott, Harley, Klein"s Microbiology, J.M. Willey, L.M. Sherwood, C.J. Woolverton,7th International, edition 2008, McGraw Hill.
- 2. Foundations in Microbiology, K. P. Talaro, 7th International edition 2009, McGraw Hill.
- 3. A Textbook of Microbiology, R. C. Dubey and D. K. Maheshwari, 1st edition, 1999, S.Chand & Company Ltd.
- 4. Brock Biology of Microorganisms, M.T.Madigan, J.M.Martinko, P. V. Dunlap, D. P. Clark- 12th edition, Pearson International edition 2009, Pearson Benjamin Cummings.
- 5. Microbiology An Introduction, G. J.Tortora, B. R.Funke, C. L. Case, 10th ed.2008,Pearson Education.
- 6. General Microbiology, Stanier, Ingraham et al, 4th and 5th edition 1987, Macmillaneducation limited.
- 7. Microbiology- Concepts and Applications, PelczarJr, Chan, Krieg, International ed, McGraw Hill.
- 8. Alexopoulos, C.J., Mims, C.W., and Blackwell, M. 2002. Introductory Mycology. JohnWiley and Sons (Asia) Pvt. Ltd. Singapore. 869 pp.
- 9. Atlas, R.M. 1984. Basic and practical microbiology. Mac Millan Publishers, USA. 987pp.
- Black, J.G. 2008. Microbiology principles and explorations. 7edn. John Wiley and SonsInc., New Jersey 846 pp.
- 11. Pommerville, J.C. Alcamo"s Fundamentals of Microbiology. Jones and BartlettPub..Sudburry, 835 pp.

Open elective-Microbiology (OEC1) Course code: 126BSC01MIBOEC01T Title of the paper: Microbial Technology for Human Welfare

	42Hrs
Unit – 1: Food and Fermentation Microbial Technology	14Hrs
Fermented Foods – Types, Nutritional Values, Advantages and Health Benefits Prebiotics, Probiotics, Synbiotics and Nutraceutical Foods Fermented Products – Alcoholic and nonalcoholic beverages, fermented dairy products, Fruit fermented drinks,	
Unit – 2: Agriculture Microbial Technology	14Hrs
Microbial Fertilizers, Microbial Pesticides, Mushroom Cultivation, Biogas Production	
Unit – 3: Pharmaceutical Microbial Technology	14Hrs
Microbial Drugs – Types and Development of Drug Resistance Antibiotics – Types, Functions and Antibiotic Therapy Vaccines – Types, Properties, Functions and Schedules	

Semester-II: BSc Microbiology (Basic /Hons) Course code: 126BSC02MIBDSC02T

Paper title:	Microbial	Biochemistry	and	Physiol	ogv
- aper mae	111101 0 01001	Diochemiser			ັກມ

Microbial Biochemistry and Physiology	56 Hrs
Unit - 1 Biochemical Concepts	14Hrs
Basic Biochemical Concepts: Major elements of life and their primary characteristics,	
atomic bonds and molecules – bonding properties of carbon, chemical bonds- covalent	
and non -covalent, Hydrogen bonds and Vander Waal Forces. Biological Solvents:	
Structure and properties of water molecule, Water as an universal solvent, polarity,	
hydrophilic and hydrophobic interactions, properties of water, Acids, bases, electrolytes,	
hydrogen ion concentration, pH, buffers and physiological buffer system,	
Handerson – Hasselbatch equation.	
Unit - 2 Macromolecules – Types, Structure and Properties	14Hrs
Carbohydrates: Definition, classification, structure and properties. Amino acids and	
proteins: Definition, structure, classification and properties of amino acids, Structure and	
classification of proteins. Lipids and Fats: Definition, classification, structure, properties	1
and importance of lipids. Porphyrins and Vitamins: Definition, structure,	
properties and importance of chlorophyll, cytochrome and hemoglobin.	
Unit – 3 Microbial Physiology	14Hrs
Microbial Growth: Definition of growth, Mathematical expression, Growth curve,	
phases of growth, calculation of generation time and specific growth rate. Synchronous	
growth, Continuous growth (chemostat and turbidostat), Diauxic growth. Measurement	
of Growth: Direct Microscopic count - Haemocytometer; Viable count, Membrane	
filtration; Electronic Counting; Measurement of cell mass;Turbidity	
measurementsNephelometer and spectrophotometer techniques;Measurements of cell	
constituents. Growth Yield (definition of terms). Influence of environmental factors on	1
growth. Microbial growth in natural environments. viable non-culturable organisms.	
Quorum sensing. Microbial Nutrition: Microbial nutrients, Classification of organisms	
based on carbon source, energy source and electron source, Macro and micronutrients.	
Unit – 4: Microbial Physiology- Bioenergetics, Microbial Respiration, Microbial	14Hrs
Photosynthesis	
Bioenergetics: Free energy, Enthalpy, Entropy, Classification of high energy	
compounds, Oxidation reduction reactions, equilibrium constant, Redox potential, Law	
of thermodynamics. Microbial Respiration: Respiratory electron transport chain in	
bacteria, oxidation – reduction reactions, protein translocation, oxidative and substrate	1
level phosphorylation – inhibitors and mechanism, chemiosmotic coupling.	
Fermentation reactions (homo and hetero)Microbial Photosynthesis: Light reaction:	
Light harvesting pigments Photophosphorylation, CO2 fixation pathways: Calvin cycle,	
CODH pathway, Reductive TCA pathway.	

Microbiology lab contents –Semester-2 Course code: 126BSC02MIBDSC02L Title paper: Microbial Biochemistry and Physiology

- 1. Preparation of Solution: Normal and Molar solutions
- 2. Calibration of pH meter and determination of pH of natural samples
- 3. Preparation of Buffer Solutions
- 4. Qualitative determination and identification of Carbohydrates
- 5. Qualitative determination and identification of Proteins
- 6. Qualitative determination and identification of Amino Acids
- 7. Qualitative determination and identification of Fatty Acids
- 8. Quantitative estimation of Reducing Sugar by DNS method
- 9. Quantitative estimation of Proteins by Biuret and Lowry's method
- 10. Determination of lipid saponification values of fats and iodine number of fatty acids
- 11. Determination of bacterial growth by spectrophotometric method & calculation of generation time
- 12. Effect of pH, temperature and Salt concentration on bacterial growth
- 13. Effect of Salt concentration on bacterial growth
- 14. Effect of Temperature on bacterial growth
- 15. Demonstration of aerobic and anaerobic respiration in microbes

**Any two experiments given in the examinations as major and minor carries 20 + 15 marks References

- 1. Felix Franks, 1993; Protein Biotechnology, Humana Press, New Jersey.
- 2. Stryer L, 1995; Biochemistry, Freeman and Company, New York.
- 3. Voet&Voet, 1995; Biochemistry, John Wiley and Sons, New York.
- 4. Nelson and Cox, 2000; Lehninger Principles of Biochemistry, Elsevier Publ.
- 5. Harper, 1999; Biochemistry, McGraw Hill, New York.
- 6. Palmer T. (2001), Biochemistry, Biotechnology and Clinical Chemistry, Harwood Publication, Chichester.
- 7. Boyer R. (2002), Concepts in Biochemistry 2nd Edition, Brook/ Cole, Australia.
- 8. Moat A. G., Foster J.W. Spector. (2004), Microbial Physiology 4th Edition Panama Book Distributors.
- 9. Caldwell, D. R. (1995) Microbial Physiology and Metabolism. Brown Publishers.
- 10. Lodish H, T. Baltimore, A. Berck B.L. Zipursky, P. Mastsydaire and J. Darnell. (2004) Molecular Cell Biology, Scientific American Books, Inc. Newyork.

Open elective- Microbiology (OEC2)

Course code: 126BSC02MIBOEC02T

Title of the paper: Environmental and Sanitary Microbiology

	42 Hrs
Unit – 1: Soil and Air Microbiology	14 Hrs
Soil and Air as a major component of environment. Types, properties and uses of soil and air, Distribution of microorganisms in soil and air, Major types of beneficial microorganisms in soil, Major types of harmful microorganisms in soil	
Unit – 2: Water Microbiology	14 Hrs
Water as a major component of environment. Types, properties and uses of water. Microorganisms of different water bodies, Standard qualities of drinking water	
Unit – 3: Sanitary Microbiology	14 Hrs
Public health hygiene and communicable diseases. Survey and surveillance of microbial infections. Airborne microbial infections, waterborne microbial infections ,Food borne microbial infections. Epidemiology of microbial infections, their detection and control.	

Text Books / References

- 1. Prescott, Harley, Klein"s Microbiology, J.M. Willey, L.M. Sherwood, C.J. Woolverton, 7th International, edition 2008, McGraw Hill.
- 2. Foundations in Microbiology, K. P. Talaro, 7th International edition 2009, McGraw Hill.
- 3. A Textbook of Microbiology, R. C. Dubey and D. K. Maheshwari, 1st edition, 1999, S. Chand & Company Ltd.
- 4. Brock Biology of Microorganisms, M.T.Madigan, J.M.Martinko, P. V. Dunlap, D. P. Clark-12th edition, Pearson International edition 2009, Pearson Benjamin Cummings.
- 5. Microbiology An Introduction, G. J.Tortora, B. R.Funke, C. L. Case, 10th ed. 2008, Pearson Education.
- 6. General Microbiology, Stanier, Ingraham et al, 4th and 5th edition 1987, Macmillan education limited.
- 7. Microbiology- Concepts and Applications, PelczarJr, Chan, Krieg, International ed, McGraw Hill.
- 8. Alexopoulos, C.J., Mims, C.W., and Blackwell, M. 2002. Introductory Mycology. John Wiley and Sons (Asia) Pvt. Ltd. Singapore. 869 pp.

Pedagogy:

The general pedagogy to be followed for theory and practicals are as under.

Lecturing, Tutorials, Group/Individual Discussions, Seminars, Assignments, Counseling, Remedial Coaching. Field/Institution/Industrial visits, Hands on training, Case observations, Models/charts preparations, Problem solving mechanism, Demonstrations, Project presentations, Experiential documentation and Innovative methods.



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

COMPUTER SCIENCE

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi

Applicable from the

Academic Year 2023-24

COMPUTER SCIENCE

Curricular and Credits Structure under Choice Based Credit System [CBCS] of Computer Science Major& One Minor Discipline Scheme for the Three year/ Four Years B.Sc. /B.Sc. Honors Programme with effect from 2023-24

SEMEST	SEMESTER-I									
Categor	Course code	Title of the Paper	Marks			Teaching hours/week		Cre	Duration of	
у			IA	SEE	Total	L	Т	Ρ	dit	exam s (Hrs)
DSC1	126BSC01CSCDSC01T	Computer Fundamentals and Programming in C	40	60	100	4	-	-	4	2
	126BSC01CSCDSC01L	C Programming Lab	25	25	50	-	-	4	2	3
OEC 1	126BSC01CSCOEC01T	C Programming Concepts	40	60	100	3	-	-	3	2

SEMESTER-II										
Category	Course code	Title of the Paper		Marks		Teaching hours/week		Credit	Duration of exams	
			IA	SEE	Total	L	Т	Ρ		(Hrs)
	126BSC02CSCDSC02T	Data Structures using C	40	60	100	4	-	-	4	2
DSCZ	126BSC02CSCDSC02L	Data structures Lab	25	25	50	-	-	4	2	3
OEC2	126BSC02CSCOEC02T	Web Designing	40	60	100	3	-	-	3	2

ASSESSMENT METHODS

Evaluation Scheme for Internal Assessment:

Theory:

Assessment Criteria	40 marks
1 st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2 nd	30
Internal Assessment Test for 30 marks 1 hr after 15 weeks . Average	
of two tests should be considered.	
Assignment	10
Total	40

Assessment Criteria	25 marks
1 st Internal Assessment Test for20 marks 1hr after 8 weeks and 2 nd	20
Internal Assessment Test for 20 marks 1hr after 15 weeks. Average	
of two tests should be considered.	
Assignment	05
Total	25

Practical:

Assessment Criteria	25 marks
Semester End Internal Assessment Test for 20 marks 2 hrs	20
Journal (Practical Record)	05
Total	25

Question Paper Pattern: Computer Science

BSc (Computer Science)

Sub: Code: Maximum Marks: 60 a. Answer any Six Questions from Question 1 b. Answer any Three each Questions from Question 2.3.4 and 5

Q.No.1.	Answer any Six Questions (Atlest Two question from Each Unit) a. b. c. d, e. f.	2X6=12
	g. h.	
Q.No.2.	(Should cover Entire Unit-I) a. b. c. d.	4X3=12
Q.No.3.	(Should cover Entire Unit-II) a. b. c. d.	4X3=12
Q.No.4.	(Should cover Entire Unit-III) a. b. c. d.	4X3=12
Q.No.5.	(Should cover Entire Unit-IV) a. b. c. d.	4X3=12

COURSE-WISE SYLLABUS

Year	Ι	Course Code: 126BS	C01CSCDSC01T		Credits	04
Sem.	1	Course Title: Comp	outer Fundamentals and Programming i	n C	Hours	52
Course	Pre-	requisites, if any	NA			
Format	tive A	ssessment Marks:	Summative Assessment Marks: 60	Duration	of ESA:.0	2
40				hrs.		
Course	9	After completing	g this course satisfactorily, a student will	l be able to	D :	
Outco	mes	Confidently operate Desktop Computers to carry out computational				
		tasks				
		 Understand 	working of Hardware and Software and	the impo	rtance	
		of operating sys	tems			
		Understand	programming languages, number syst	ems, perij	pheral	
		devices, network	king, multimedia and internet concepts			
		• Read, under	stand and trace the execution of progra	ams writte	n in C	
		language				
		Write the C o	code for a given problem	· ~		
		Perform inpl	It and output operations using program	is in C		
		Write programs that perform operations on arrays				
Unit N	0.	Course Content				S
Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics of Computers, Evolution and History of Computers, Types of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples.Introduction to C Programming: Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.		13				
Unit II	C Programming Basic Concepts: C C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Unit II Input and output with C: Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and				13	

Semester I

	puts functions. C Operators & Expressions : Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence andAssociatively; Evaluation of arithmetic expressions; Type conversion.			
Unit III	 Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder,Switch-case, goto, break & continue statements; Looping Statements - Entry controlled and Exit controlled statements, while, do-while, for loops, Nested loops. Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumericetc. 	13		
Unit IV	 Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers; User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type. User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure wariables, Array of Structures; Unions - Union definition; 	13		
	Recommended Leaning Resources			
Print	Text Books			
Resources	 First BOOKS 1. Pradeep K. Sinha and PritiSinha: Computer Fundamentals (Sixth Edition), BPBPublication 2. E. Balgurusamy: Programming in ANSI C(TMH) 			
	References1. Kamthane: Programming with ANSI and TURBO C (Pearso2. V. Rajaraman: Programming in C (PHI –EEE)3. S. ByronGottfried: Programming with C(TMH)4. Kernighan &Ritche: The C Programming Language(PHI)5. YashwantKanitkar: Let usC	nEducation)		

Year	I	Course Code: 126BSC01CSCDSC01L		Credits	02	
Sem.	Ι	Course Title: C Progr	amming Lab		Hours	45
Course	Pre-	requisites, if any:	Knowledge of Programming			
Forma	tive A	ssessment Marks: 25	Summative Assessment Marks: 25	Duration	of ESA: 0	3 hrs.
	Practice Labs					
	1. The following activities be carried out/ discussed in the lab during the initial period of					
		the semester.				
		1. Basic Con	puter Proficiency			
		a. Fai	niliarization of Computer Hardware Pa	rts		
		b. Ba	sic Computer Operations and Maintena	ance.		
		C. DO	s and Don'ts, Safety Guidelines in Com	nputer Lab		
		2. Familiariz	ation of Basic Software – Operating	System,	word Pro	Cessors,
		Internet	Browsers, Integrated Development	Environr	nent (ID	E) WITH
		2 Type Dre	aram Codo. Dobug and Compile h	acia prog	rame cou	aring C
		3. Type Pro	grant Code, Debug and Compile b	asic prog		ening C
		FIOgrafiii	ing fundamentals discussed during th	leory class		
		Part A:				
		1. Write a C Progra	am to read radius of a circle and to find	d area and	circumfe	rence
		2. Write a C Progra	am to read three numbers and find the	e biggest c	of three	
		3. Write a C Progra	am to demonstrate library functions in	math.h		
		4. Write a C Progra	am to check for prime			
		5. Write a C Progra	am to generate n primes			
		6. Write a C Progr	am to read a number, find the sum of	the digits,	reverse t	he number and
		check it for pali	ndrome			
		7. Write a C Progr	am to read numbers from keyboard co	ontinuously	y till the u	ser presses 999
		and to find the	sum of only positive numbers			
		8. Write a C Progr	am to read percentage of marks and to	o display a	ppropriat	e message
		(Demonstration	of else-ifladder)	tion (dono		f
		9. Write a C Progr	am to find the roots of quadratic equa	tion (dem	onstratior	1 of switch-case
		10 Write a C prog	am to read marks scored by n stude	nts and fi	nd the av	erage of marks
		(Demonstration	of single dimensional array			erage of marks
		11 Write a C Progra	am to remove Duplicate Element in a si	inale dime	ensionalAr	rav
		12. Program to per	form addition and subtraction of Matric	ces		,
		PART B:				
		1. Write a C Progra	am to find the length of a string withou	ut using bu	uilt in fund	ction
		2. Write a C Progra	am to demonstrate string functions.	5		
		3. Write a C Progra	am to demonstrate pointers in C			
		4. Write a C Progra	am to check a number for prime by def	fining <i>ispri</i>	i <i>me()</i> func	tion
		5. Write a C Progra	am to read, display and to find the trac	e of a squ	are matrix	K
		6. Write a C Progra	am to read, display and add two m x n	matrices u	using func	tions

- 7. Write a C Program to read, display and multiply two m x n matrices using functions
- 8. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
- 9. Write a C Program to Reverse a String using Pointer
- 10. Write a C Program to Swap Two Numbers using Pointers
- 11. Write a C Program to demonstrate student structure to read & display records of n students.
- 12. Write a C Program to demonstrate the difference between structure &union.

Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course

Assessment Criteria	Marks	
Activity – 1 from Part A	Write up on the activity/ task	3
	Demonstration of the activity/ task	07
Activity-2 from Part B	Write up on the activity/ task	3
	Demonstration of the activity/ task	07
Viva based on Lab Activiti	05	
Total		25

Evaluation Scheme for Lab Examination

OPEN-ELECTIVE SYLLABUS:

Year	Ι	Course Code: 126BSC	01CSCOEC01T		Credits	03
Sem.	1	Course Title: C Prog	ramming Concepts		Hours	40
Course	Pre-	requisites, if any	NA			
Format	Formative Assessment Marks: 40 Summative Assessment Marks: 60 Duration of				of ESA:.02	hrs.
Course	9	At the end of the cou	Irse the student should be able to:			
Outco	mes	1. Read, understand	and trace the execution of programs	written in (C languag	e
		2. Write the C code	for a given problem		5 5	
3. Perform input and output operations using programs in C						
		4. Write programs th	nat perform operations on arrays			
		5. Write user defined	d functions to perform a task			
			'			
Unit N	o .		Course Content		Hour	'S
		Introduction to C	Programming: Overview of C: His	story and	10	
		Features of C; Struc	ture of a C Program with Examples;	Creating		
		and Executing a	C Program; Compilation process	in C. C		
Unit I		Programming Bas	ic Concepts: C Character Set; C	tokens -		
		keywords, identifie	rs, constants, and variables; Dat	ta types;		
		Declaration & initial	ization of variables; Symbolic constan	its.		
					10	
		Input and output w	Ith C: Formatted I/O functions – print	tandscant,	10	
		control stings and	escape sequences, output specifica	uons with		
		print/functions, onto	matted i/O functions to read and dis			
			g - geichar, paichar, geis and pais in	Rolational		
			porators: Assignment operators: Inc	romont &		
Unit II		Docromont operato	rs: Bitwise operators: Conditional	operator:		
of the th		Special operators:	Operator Precedence and Ass	operator,		
		Special Operators, Evaluation of arithr	operator Precedence and Ass	Control		
		Structures Decision	making Statements Simple if if a	lso postod		
		if also also if ladder	Switch Case acto broak & continue st	ise, nesieu		
			Switch Case, golo, break & continue st	atements		
		Looping Statement	s - Entry controlled and exit	controlled	10	
		statements, while, do	-while, for loops, Nested loops.			
		Derived data type	es in C: Arrays: One Dimensional	arrays -		
		Declaration, Initial	zation and Memory representati	on; Two		
Unit III		Dimensional arrays	- Declaration, Initialization and	Memory		
		representation.				
		Strings Declaring	& Initializing string variables: String	handling		
		functions - strlon	tromp strong and stroat. Character	handling		
		functions - toascii to	upper tolower isalnha isnumericetc	handing		

Unit IV	User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.10
	Recommended Leaning Resources
Print	Text Books:
Resources	1. C: The Complete Reference, By HerbertSchildt.
	2. C Programming Language, By Brain W.Kernighan
	3. Kernighan & Ritchie: The C Programming Language(PHI)
	References
	1. E. Balaguruswamy: Programming in ANSI C(TMH)
	2. Kamthane: Programming with ANSI and TURBO C (PearsonEducation)
	3. V. Rajaraman: Programming in C (PHI –EEE)
	4. S. Byron Gottfried: Programming with C(TMH)
	5. YashwantKanitkar: Let usC

Semester: II

Year	Ι	Course Code: 126B	Credit	04				
Sem	2	Course Title: Data	Structures using C		s Hours	52		
Course	Dro	requisites if any			nours	52		
Format	tive A	Assessment Marks	NA Summative Assessment Marks: 60	Durati	on of FSA	· 02		
40			Summative / issessment marks. 00	hrs.		. 02		
Course	5	After completi	ng this course satisfactorily, a student will be	able to:				
Outco	me	Describ	e how arrays, records, linked structures, stack	S,				
S	 queues, trees, and graphs are represented in memory and used by algorithms Describe common applications for arrays, records, linked 							
		structu	res, stacks, queues, trees, and graphs					
		• Write p trees, a	rograms that use arrays, records, linked struct nd graphs	ures, sta	acks, queu	ies,		
		Demon	strate different methods for traversing trees					
		• Compa	re alternative implementations of data structu	res with	respect			
		to perf	ormance					
		Describ Discuss	the concept of recursion, give examples of r	ts use algorith	mc for			
		sorting	and searching	aigontii				
Unit N	о.		Course Content		Hour	rs		
		Introduction to d	ata structures: Definition; Types of data struc	tures -	13			
		Primitive & Non-	primitive, Linear and Non-linear; Operations of	on data				
		structures. Alg						
		Performance Mea						
Unit I		Recursion: Defin	ition; Types of recursions; Recursion Tec	hnique				
		Examples - Fibona						
		Hanoi; Compariso						
		Basic Concepts –	Definition, Declaration, Initialization,					
		data types (ADT); Representation of Linear Arrays in memory;						
		Traversing linear a	arrays; Inserting and deleting elements; Sortin	g–	13			
		Selectionson, but	potesort, Quick sort, Selection sort, Insertion so	urcivo				
Unit II		searching - Seque	Starke Basic Oni	cents-				
		DefinitionandRen	resentationofstacks:Operationsonstacks [.] Appli	cation				
		s of stacks; Infix,	postfix and prefix notations; Conversion from	n infix				

	to postfix using stack; Evaluation of postfix expression using stack;				
Unit III	Queues: Basic Concepts – Definition and Representation of queues; Types of queues - Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, reallocandfree.Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly liked list, Header liked list, Circular linked list; Representation of Linked list in Memory;	13			
	Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection				
UnitlV	Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorderandPostordertraversal; Reconstruction of a binary tree when any two of the traversals are given13				
	Recommended Leaning Resources				
Print Resources	 Reference Books: 1. Ellis Horowitz and SartajSahni: Fundamentals of Data Structures 2. Tanenbaum: Data structures using C (Pearson Education) 3. Kamathane: Introduction to Data structures (Pearson Education) 4. Y. Kanitkar: Data Structures Using C(BPB) 5. Kottur: Data Structure Using C 6. Padma Reddy: Data Structure Using C 7. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solut Hill Education,2007) 	ions (McGraw			

Year	Ι	Cou	rse Code :126BSC	02CSCDSC02L		Credits	02
Sem.	П				Hours	45	
		Со	urse Title: Data St				
Course	e Pre-	requ	uisites, if any:	Knowledge of Programming			
Forma	tive A	Asses	sment Marks: 25	Summative Assessment Marks: 25	Duration	of ESA: 0	3 hrs.
		Pa	rt <u>A</u> :				
		1.	Write a C Program	n to find GCD using recursive function			
		2.	Write a C Program	n to display Pascal Triangle using binom	nial funct	ion	
		3.	Write a C Program	n to generate n Fibonacci numbers usin	g recursi	ve functio	n.
		4.	Write a C Program	n to implement Towers of Hanoi.			
		5.	Write a C Program	m to implement dynamic array, find sm	nallest an	id largest	
			element of the ar	ray.			
		6.	Write a C Program	n to create two files to store even and c	odd numl	pers.	
		7.	Write a C Program	n to create a file to store student record	ds.		
		8.	Write a C Program	n to read the names of cities and arrang	ge them a	alphabetic	cally.
		9.	Write a C Program	n to sort the given list using selection so	ort techni	que.	
		10.	Write a C Program	n to sort the given list using bubble sort	t techniq	ue.	
		PA	RT B:				
		1.	Write a C Program	n to sort the given list using insertion so	ort techni	que.	
		2.	Write a C Program	n to sort the given list using quick sort t	technique		
		3.	Write a C Program	n to sort the given list using merge sort	techniqu	ie.	
		4.	Write a C Program	n to search an element using linear sear	rch techn	ique.	
		5.	Write a C Program	n to search an element using recursive k	binary sea	arch techr	nique.
		6.	Write a C Program	n to implement Stack.	,		•
		7.	Write a C Program	n to convert an infix expression to postf	fix.		
		8.	Write a C Program	n to implement simple queue.			
		9.	Write a C Program	n to implement linear linked list.			
		10.	Write a C Program	n to display traversal of a tree.			

Evaluation Scheme for Lab Examination

Assessment Criteria	Marks	
Activity – 1 from Part A	3	
	Demonstration of the activity/ task	07
Activity-2 from Part B	3	
	Demonstration of the activity/ task	07
Viva based on Lab Activit	05	
Total		25

OPEN-ELECTIVE SYLLABUS:

Year		Course Code: 126BSC	Credits	03		
Sem.	II	Course Title: Web Do	esigning		Hours	40
Course	e Pre-	requisites, if any	NA			
Forma	tive A	ssessment Marks: 40	Summative Assessment Marks: 60	Duration of	of ESA:.02	hrs.
Course	е	At the end of the cou	irse the student should be able to:			
Outco	mes	1. Rea	d, understand and trace the executior	n of progra	ms	
		2. Writ	te the code for a given problem			
		3. Perf	orm input and output operations usir	ng program	าร	
11 :		4. VVri	te user defined functions to perform a	a task		
Unit N	10.	lliston of latera at T		ah Camran	Hour	S
Unit I		History of Internet, In URL, Working of W Content, Websites, H tools; Web graphics design tools: Gimp-image re file types. Introduc programming?, web	he world wide web, web Browser, w /eb, Web Page, Types of Web Pag ome Pages, Building Website, Website h, basic tips for graphics design, Web I esize, crop, edit background, save with ction to web programming: what programming languages.	eb Server, ges, Web e building Designing n different t is web	10	
Unit II		Introduction to XHTM markup, Images, Hyp <form>,<input/>,<lab buttons(submit and n Selector forms, Pro properties, Color, Al images, The </lab </form>	10			
Unit III	I	JavaScript: Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions; Errorsin scripts; Examples.				
Unit IV	/	Introduction to XM Displaying raw XML of CSS,XSLT Stylesheets Web Design: Concept including Browser, Bo and Feel of the We design, Sitemap, Plan effective navigation	L, Syntax of XML , XML document documents, Displaying XML document and Displaying XML documents with its of effective web design, Web design andwidth and Cache, Display resolut bsite, Page Layout and linking, Use ming and publishing website, Design	structure, nts with n XSLT. gn issues ion, Look er centric ing	10	

	Recommended Leaning Resources
Print	Text Books:
Resources	 Robert W. Sebestra, "Programming the World Wide Web", 7th Edition /4th edition Addison Wesley Publication,2013.
	References:
	 Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
	2. Web Technologies, Black Book, dreamtech Press
	3. HTML 5, Black Book, dreamtech Press
	4. Web Design, Joel Sklar, Cengage Learning
	5. Developing Web Applications in PHP and AJAX, Harwani, McGrawHill
	 Internet and World Wide Web How to program, P.J. Deitel& H.M. Deitel, Pearson



BAGALKOT UNIVERSITY

MUDHOL ROAD, JAMKHANDI-587301

DIST: BAGALKOTE

GEOGRAPHY

(B. Sc/B.A)

FIRST AND SECOND SEMESTER SYLLABUS

As per NEP 2020 and adapted from RCU Belagavi

Applicable from the

Academic Year 2023-24

Question Paper Pattern for Theory

Department of Geography

Sub:

Maximum Marks: 60

Instructions:

Answer the questions from every Section i.e. A, B, C, D, and E

Section A	Answer any Five Questions out of six questions	2 X 5 = 10 Marks
Section B	Answer any Four Questions out of Six questions	5 X 4 = 20 Marks
Section C	Answer any Three Questions out of Five questions 10 marks Each	10 X 3 = 30 Marks
	Total	60 Marks

Question Paper Pattern for Practical

Department of Geography

Sub:

Maximum Marks: 25

Code:

Duration : 3 hours

Instructions:

Answer all the sections

Section A	Answer any Two Questions out of Four questions	4 X 2 = 8 Marks
Section B	Answer any Two Questions out of Four questions	5 X 2 = 10 Marks
Section C	Answer any One Question out of Three questions	7 X 1 = 7 Marks
	Total	25 Marks

Code: Duration : 3 hours

Proposed Curricular and Credits Structure under Choice Based Credit System [CBCS] of Geography Discipline Scheme for the Three Years/ Four Years Geography B.A. / B.Sc.

	B.A./B.Sc. SEMESTER-I									
	126BSC01GEGDSC01T	Principles of Geomorphology	40	60	100	4	-	-	4	2
DSCI	126BSC01GEGDSC01L	Topographical Analysis	25	25	50	-	-	4	2	3
OE	126BSC01GEGOEC01T	Earth System Dynamics								
(Any one)	126BSC01GEGOEC02T	Introduction to Natural Resources	40	60	100	3	-	-	3	2
	126BSC01GEGOEC03T	Introduction to Physical Geography								
	126BSC01GEGOEC04T	Fundamentals of Remote Sensing								
Tot					700 Semest		ester Credits		25	

Undergraduate Honors Programme with effect from 2023-24

B.A./B.Sc. SEMESTER-II										
Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of
			IA	SEE	Total	L	Т	Ρ		exams (mrs)
DSC2	126BSC02GEGDSC02T	Introduction to Climatology	40	60	100	4	-	-	4	2
	126BSC02GEGDSC02L	Weather Analysis	25	25	50	-	-	4	2	3
053	126BSC02GEGOEC01T	Introduction to Human Geography								
(Any one)	126BSC02GEGOEC02T	Fundamentals of Natural Disasters	40	60	100	3	-	-	3	3
	126BSC02GEGOEC03T	Climate change : Vulnerability and								
		Adaptation								
	126BSC02GEGOEC04T	Basics of GIS								
	Total Marks					Sem	ester C	redits		25

B.A./ B.Sc. Semester 1 THEORY

Title of the Course: Principles of GeomorphologyCode : 126BSC01GEGDSC01T

Number of Theory CreditsNumber of lecture hours/ semesterNumber of Theory Classes per					
4	56 hrs	4 hrs			
 Course Outcomes: After the completion of this course, students should be able to: Define the field of Geomorphology and to explain the essential principles of it. to outline the mechanism of dynamic nature of the Earth's surface and interior of the Earth. to illustrate and explain the forces affecting the crust of the earth and its effect on it. to understand the conceptual and dynamic aspects of landform development Course Objectives: This course aims to: To define the concepts in Geomorphology and Physical Geography To introduce various concept to understand cycles of the solid Earth surface To understand the dynamic nature of the Earth's surface, various processes, andlandforms. 					
	Content of Theory Co	ourse 1	56 Hrs.		
Unit — 1 Geomorphology					
Introduction to Geography: Physical and Human Geography Introduction to Geomorphology: Meaning, Nature, Development, and Scope Principles of Geomorphology, Geological Time Scale Distribution of continents and oceans basins					
Unit — 2 Systems	and Cycles of the Solid Ear	rth	15		
Internal structure of the earth, Alfred Wegener's continental drift, Concept of Isostasy Homles Convectional current theory, Theory of Plate Tectonics: plate boundaries, subduction, concept of sea floor spreading, Vulcanicity and earthquake Case Studies: Volcano, Earthquake: reporting of latest incidents					
Unit — 3 The Dyr	namics of Earth		15		
Earth's Movements: Endogenetic and Exogenetic forces, Sudden and Diastrophic movements- Epeirogenetic and Orogenetic Movements. Process of folding and faulting Rocks: Characteristics, types, importance, and rock cycle, Weathering: meaning, types and controlling factors Mass Movement: meaning, controlling factors, types-landslides, rock-falls16					

Evolution of Landforms	
Landforms: meaning, types and factors controlling landforms development	
Slope development: Concept and types	
Concept of Cycle of Erosion—W. M. Davis	
Agents of Denudation: River; Groundwater, Sea waves, Wind and Glaciers and resultant landforms.	
Application of geomorphology: in India and Karnataka (Regional planning,	
Urban planning and transportation, Mining, Hazard management, Agriculture	
and Environmental management).	

Textbooks

- 1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.
- 2. P Mallappa, Physical Geography (Kannada Version)
- 3. Ranganath Principles of Physical Geography (Kannada Version)
- 4. Nanjannavar S S: Physical Geography (Kannada Version)
- 5. Hugar M R Physical Geography part 1 (Kannada Version)
- 6. Goudar M B, Physical Geography (Kannada Version)
- 7. Kolhapure and S S Nanjan, Physical Geography (Kannada Version)

References

1 . Bloom A.L. (1978) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice — Hall of India, New Delhi.

- 2. Brunsden D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methnen, U.K.
- 3. Chorley, R.J., Schumm, S. A. and Sugden, D.E. 1984: Geomorphology, Methuen, London
- 4. Cooke, R.U. and Warren, 1973: Geomorphology in Deserts, Batsford, London
- 5. Dayal, P. 1996: Textbook of Geomorphology, Shukla Book Depot, Patna.
- 6. Goudie Anrew et.al. (1981) Geomorphological Techniques, George Allen & Unwin, London.
- 7. Homes A. (1965) Principles of Physical Geology, 3rd Edition, ELBSS Edn.
- 8. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
- 9. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley Intl. Edn. & Wiley, 1984.
- 10. Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Develop- ment, Elsevier, Amsterdam.

Reference Websites

- 1. http://www.solarviews.com/eng/earth.htm
- 2. http://www.moorlandschool.co.uk/earth/tectonic.htm
- 3. https://www.usgs.gov/ 4. https://www.ksndmc.org

Pedagogy

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Case study	30%	
Assignment	20%	
CIA	50%	
Total	100%	

B.A./ B.Sc. Semester 1 PRACTICAL

Title of the Course : Topographical Analysis Code: 126BSC01GEGDSC01L

Number of practical Credits	Number of practical hours/ semesters	Numl practica per v	per of l classes week
2	52 hrs	4 hrs	
Content of Practical Course 1		52 Hrs.	
Exercise-I: Identification of Rocks and Minerals: Mineral samples: Iron ore, Bauxite ore and Manganese, Rock Samples: Granite, Basalt, Lime Stones, Sandstone, quartzite, and marble.			6
Exercise-2: Extraction and interpretation of Geomorphic information from Topographical maps			6
Exercise-3: Preparation of contour map from toposheet			6
Exercise-4: Interpretation of Physical features of SOI Maps (2 Exercise)			7
Exercise-5: Interpretation of Cultural features of SOI Maps (2 Exercise)			7
Exercise 6: Interpretation of relationship between physical and cultural features (1 Exercise)			8
Field Work: Identification of physical and cultural features of local area.		6	
Case Study: students must be taken to observe local land formation and degradation and write a report on their effectiveness.		6	

Pedagogy

Formative Assessment			
Assessment Occasion/ type	Weightage in Marks		
Case study	30%		
Assignment	20%		
CIA	50%		
Total	100%		

OPEN ELECTIVE (OE) - 1 THEORY

Title of the Course: Earth System Dynamics

Code: 126BSC01GEGOEC01T

Number of	Number of lecture	Number of Theory classes per we	ek
Theory Credits	hours/ semester	Number of practical hours/ seme	sters
3	3 56 hrs 3 hrs		
 Course Outcomes: This course is to make understand the basic concepts of earth and to impart necessary skills of earth system, and dynamics to the students. So that, studen acquire basic understanding of the mother earth To articulate the synergies and trade-offs of earth system and interconnected subs stems to the students of interdisciplinary students. 		oart udents cted	
 Course Objectives This course aims to 1. Understand the concepts in Earth Sciences 2. To study the global issues in the Earth system 3. To stud application of geoinformatics to solve the disaster and hazards 			Ι
Content of Theory Course		56Hrs	
Unit — 1 Earth System Dynamics		10	
Origin of Earth and its forms, plate tectonics, layers of earth and composition, geological epochs, evolution of species, extinctions, ice ages, continental drift theory, Process of atmosphere, hydrosphere, biosphere, lithosphere, and their interaction. Trajectories of the Earth System in the Anthropocene.			
Unit — 2 Issues in Earth System			14
Global warming, greenhouse effect, carbon cycle, nitrogen cycle, water cycle, ozone depletion, floods, droughts, weather variations, sea level rise, changing ecosystems, snow / glaciers melting and impact of pollution.			
Unit — 3 Climate Change		14	
The physical science of climate system and change, concepts, causes, effects, measures, climate change; Land — Climate interactions and climatic zones of world and India; Climate change and linkages with energy, emerging diseases, community response.			
Unit — 4 Geoinformatics Applications: Concepts of hazards, risks and vulnerability; their analysis relating climate projections and their uncertainties; global warming, floods and droughts, and weather variations, ecosystems changes, and snow/glaciers melting, energy studies, health and diseases studies and other case studies.			14

References

- 1. The Dynamic Earth System (2012), Prentice Hall India Learning Private Limited; Third edition (2012) A.M. Patwardhan
- 2. Earth's Dynamic Systems (2003), Pearson; 10th edition (2003), W. Kenneth Hamblin & Eric H. Christiansen
- 3. Planet Earth: Cosmology, Geology, and the Evolution of Life and Environment (1992) Cesare Emiliani
- 4. Earth: Evolution of a Habitable World, 2nd edn., Cambridge, UK: Cambridge University Press (2013) Jonathan l. Lunine.
- 5. Evolution of the Earth, McGraw-Hill Education; 8th edition (2009) Donald Prothero, Robert Dott, Jr.
- 6. A Tex tbook of Climatology, Wisdom Press (2015) Tapas Bhattacharya

Pedagogy

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Case studies	30%	
Assignment	20%	
CIA	50%	
Total	100%	

OPEN ELECTIVE (OE) - 2 THEORY

Title of the Course: Introduction to Natural Resources**Code :** 126BSC01GEGOEC02T

Number of Theory Credits	Number of lecture hours/ semester	Number of lecture hours/ w	/eek
3	42 hrs	3 hrs	
 Course Outcomes: At the end of the course the students will: 1. Understand concepts of different natural resources, its use, overuse, with its solution by natural resource management methods. 2. Appreciate the need for managing land and water resources for sustainable growth and development, managerial skills such as land evaluation and landclassification. 3. Also, able to understand the causes and consequences of water stress and draw water conservation and management plans. 			
 Course Objectives: This course aims to 1. Explain the types of natural resources that exist. 2. Study the role of government and different agencies in the natural resource management 3. Stud the threat to the natural resources and the polycies to solve it. 			
	Content of Theory Con	ırse	42Hrs
Unit — 1 Concept of Resources		12	
Meaning, Definition, importance and classification of Resources, Appraisal of Natural Resources, Natural Resources Economics, History of Conservation, need for conservation and Management of Natural Resources —Role of Government and NGO Agencies, Resource Creating Factors. Environmental Risk- types, wildlife, forest risk and its impact on environment and its management.			
Unit — 2 Land Resources			10
Land Evaluation Methods, Land classification Methods, Land use and Land cover Mapping changes. Issue related to land use change —Land use and population, Land use pattern in the world. Land source at stress, land use planning and development. Soil erosion, soil degradation, methods of conservation.			
Unit — 3 Water Resources		10	
Importance of water, Recent trends in water use in the world and in India, water crises, (stress) causes and consequences of water stress or crises, methods of water conservation, watershed management, coastal and ocean Resources management, Fisheries Management			
Unit — 4 Minerals Resources		10	
Types of minerals, classifications of Major Minerals, their distribution and production. Such as Petroleum, Coal, Iron ore, Bauxite and Copper etc, and its uses. Mineral exploration methods, Mining, and its effects on environment. Mineral's conservation and mining policy			

References

- 1 . Dr.Alka Gautham: Geography of Resources: Exploitation, Conservation and Mangement, Sharada Pustak Bhavan, Allahabad.
- 2. Dr.P.S.Negi: Geography of Resources: Kedarnath Ramnath Publishers, New Delhi
- 3. Dr.Rajashekara Shetty(2009): An Analysis of World Resources with reference to India, Sarala Raj, Ria Publishers, Mysore
- 4. Khanna K.K and Gupta V.K.(1993): Economic and Commercial Geography, Sultan Chand, New Delhi
- 5. Prof. Zimmerwan World Resources and Industries
- 6. Roy, P.R(2001) Economic Geography A Study of Resources, New Central Book Agency, Calcutta.

Pedagogy

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Case studies	30%	
Assignment	20%	
CIA	50%	
Total	100%	
OPEN ELECTIVE (OE) - 3 THEORY

Title of the Course: Introduction to Physical Geography Code : 126BSC01GEGOEC03T

Number of Theory	Number of lecture hours/	Number of lec	ture
	semester 42 h	nours/ week	
3	42 hrs	3 hrs	
 Course Outcomes: Students will be able to understand the fundamental concepts in E Sciences Understands basic terminology used to describe physical processe landscape forms. Describe elements of the atmosphere and the oceans 			Earth es and
This course aims to			
 Study basic princ Understand the la basics of oceanog 	siples of the Earth Sciences andforms, atmospheric element graphy	s and structure a	ind
C	ontent of Theory Course		42Hrs
Unit - 1			12
Origin, Shape and Size of the Earth, Movement of the Earth- Rotation and Revolution, Effects of the movement of Earth, Coordinates -Latitude, Longitude and Time. Structure of the Earth,			
Unit—2			10
Rocks - types, significar Weathering —types. Agents of Denudation - water. Volcanicity, Eart	nce, River, Glacier, Wind and Under hquakes and Tsunamis	Ground	
Unit -3			10
Structure and Composi Weather and Climate. Atmospheric Temperat Atmospheric Pressure,	tion of Atmosphere, cure, Heat Budget of the atmosp Winds and Precipitation	nere	
Unit — 4			10
Distribution of Land an Temperature and Salin Ocean Tides, Waves an and Indian Oceans. Marine Resources: Biot	d Sea, Submarine Relief of the C ity of Sea Water. d Deposits, Ocean currents - Atl ic, mineral and energy resource	Ocean, antic, Pacific 's	

References

- 1. B.S. Negi (1993) Physical Geography. S.J. Publication, Meerut
- 2. D.S. Lal (1998) Climatology. Chaitnya publishing house, Allahabad
- 3. K. Siddhartha (2001) Atmosphere, Weather and Climate. Kisalaya publication, New Delhi
- 4. R.N. Tikka (2002) Physical Geography. Kedarnath Ramnath & co, Meerut

5. Willian D. Thornbury (1997) Principle of Geomorphology. New Age International (Pvt Ltd.) New Delhi.

Formative Assessment	
Assessment Occasion/ type	Weightage in Marks
Case studies	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE (OE) - 4 THEORY

Title of the Course: Fundamentals of Remote Sensing Code : 126BSC01GEGOEC04T

Number of	Number of lecture	Number of lecture hours/
Theory Credits	hours/ semester	week
3	42 hrs	3 hrs

Course Outcomes:

- 1. This course is to make understand the basic concepts of Remote Sensing and to impart necessary skills of remote sensing analysis, and image interpretation to the students. So that, students acquire employable skills in remote sensing.
- 2. Students will learn how to handle and process the satellite images for understanding of bio physical phenomena of the earth s stem.

Course Objectives:

- 1. To congregate the basic concepts and fundamentals of physical principles of remote sensing
- 2. To create a firm basis for successful integration of remote sensing in any field of application.
- 3. To study basics of digital image processing and image interpretation techniques.
- 4. To stud the applications of the remote sensing to solve the real-world problems.

Content of Theory Course	42Hrs
Unit— I Introduction	
Definition of Remote Sensing, developmental stages, Laws of Physics, electromagnetic waves, spectrum, regions, wavelength, frequencies, and applications. Types-Satellites, Sensors, Payloads, Orbits, telemetry of satellites.	
Unit – 2 Process and types of Remote Sensing	12
Process of remote sensing, interaction of radiation with atmosphere and targets, atmospheric noises, attenuation in radiance, resolutions of remote sensing, optical remote sensing, visible region of the spectrum, thermal remote sensing, microwave remote sensing, Hyperspectral remote sensing, LiDAR, and other remote sensing platforms.	
Unit — 3 Image Classification and Interpretation	10
Satellite products and its spectral characteristics, composite images, band ratios; Land use land cover classification schemes-Anderson and NRSC; Visual image interpretation, elements, stages of interpretation and interpretation keys. Image classification- supervised, unsupervised, and principal component analysis (PCA) and accuracy assessment.	

Unit — 4 Applications of Remote Sensing	
Disaster Management, Meteorological Studies, Agricultural and	
Irrigation Studies, Forestry Studies, Hydrological Studies, Natural	
Resource, Oceanic and Coastal mapping, Soil resource mapping,	
Urban and Rural Mapping and Management.	

References:

- 1. Remote Sensing of the Environment: An Earth Resource Perspective (Prentice Hall Series in Geographic Information Science) Second Edition (2006), John Jensen
- 2. Remote Sensing and GIS, Second Edition (201 1), Bhatta, B.
- 3. Introduction to Remote Sensing and Image Interpretation (2003); Lillesand T.M.
- 4. Remote sensing and image interpretation (2015); Chipman, Jonathan W., Kiefer, Ralph W., Lillesand
- 5. Introduction to Remote Sensing, Fifth Edition (2011); James B. Campbell, Randolph H. Wynne
- 6. Practical handbook of remote sensing, First Edition (2016) Lavender, Andrew, Lavender, Samantha
- Introductory Digital Image Processing: A Remote Sensing Perspective, Fourth Edition (2015) – John R. Jensen
- 8. Image processing and GIS for remote sensing: techniques and applications; Second Edition (2016) Liu, Jian-Guo, Mason, Philippa J

1.https://onlinecourses.nptel.ac.in/noc19 e41/preview

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Case studies	30%	
Assignment	20%	
CIA	50%	
Total	100%	

B.A./ B.Sc. Semester II

THEORY

Title of the Course: Introduction to Climatology

Code: 126BSC02GEGDSC02T

Number of Theory Credits	Number of lecture hours/ semester	Number of Theory classes /	' week
4	4 56 hrs 4 hrs		
 Course Outcomes:After the completion of this course, students should be able to 1. Define the field of climatology and to understand the atmospheric composition and structure. 2. To outline the mechanism and process of solar radiation transfer to earth surface and to ex- plain the temperature distribution and variation according to time and space. 3. To illustrate and explain the air pressure system, wind regulating forces and theformation of the Atmospheric Disturbance. 4. To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types. 			e to sition I ling to nd cess
 Course Objectives: This course aims to: 1. To define the field of climatology and components of the climate system 2. To introduce various dimensions of climatology like structure and composition 3. To understand the global atmospheric pressure, temperature, and wind system 4. To study the concept of atmospheric moisture and its types 			osition. system.
	Content of Theory Co	urse 1	56Hrs
Unit— 1 Composition Nature and Scope of O Meteorology Origin and structure Mesosphere, Ionosph Composition of the a	on and Structure of the A Climatology, Atmospheric of the Atmosphere: Tropo nere, Exosphere and their tmosphere, Weather and	Atmosphere Sciences; Climatology and Sphere, Stratosphere, characteristics. Climate	10
Unit — 2 Atmospheric Temperature		16	
Insolation: Definition Insolation. Heating and cooling p convection, and adve Temperature: meanin Temperature Distribution of the te temperature. Global Energy Budge Longwave Terrestria Heat Balances.	, Mechanism, Solar Const process of the atmosphere ection. ng and Influencing Factor mperature: Vertical, Horis t: Incoming shortwave so l radiation, Albedo. Net Ra	ant.Factors affecting the e-Radiation, Conduction, rs on the Distribution of zontal, and Inversion of olar radiation, Outgoing adiation and Latitudinal	
Unit — 3 Atmosphe	eric Pressure and Winds	5	
Atmospheric Pressur Vertical and Horizon andPressure Belts, P Winds: influencing fa Variable winds-Cyclo	e: Influencing factors on a tal Distribution of the atm ressure Gradient.Ferrel's ctors, Types - planetary, s ones and anti-cyclones.	atmospheric pressure. nospheric pressure Law seasonal, local wind	15

Air-Masses and Fronts: Definition, Nature, Source Regions, Classification.	
Unit — 4 Atmospheric Moisture Humidity: Sources, influencing factors and types-Absolute, Relative and Specific. Hydrological cycle: process of evaporation, condensation, Clouds and its	
types Precipitation and its forms. Climate Change: Causes and consequences, recent issues-floods, drought,	15

Textbooks

- 1 Lal, D. S. (1998). Climatology. Allahabad: Chaitanya Publishing House.
- 2 P Mallappa, Physical Geography (Kannada Version)
- 3 Ranganath Principles of Physical Geography (Kannada Version)
- 4 Nanjannavar S S: Physical Geography (Kannada Version)
- 5 Hugar M R Physical Geography part 2 (Kannada Version)
- 6 Goudar M B, Physical Geography (Kannada Version)
- 7 Kolhapure and S S Nanjan, Physical Geography (Kannada Version)
- 8 Hangaragi S.S., Climatology and Biogeography (Kannada Version)

References

- 1. Lutgens, Frederic K. & Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
- 2. Oliver, John E. & Hidore, John J. (2003). Climatology: An Atmospheric Science. Delhi: Pearson Education.
- 3. Singh, S. (2005). Climatology. Allahabad: Prayag Pustak Bhawan.
- 4. Barry, R.G. and Chorley, R.J. (2003): Atmosphere, Weather and Climate; Psychology Press, Hove; East Sussex.
- 5. Critchfield, H.J., (1975): general Climatology, Prentice Hall, New Jersey.
- 6. Mather, J.R. (1974): Climatology: Fundamentals and Applications; Mc Craw Hill Book co., U.S.A.
- 7. Rumney, G.R. (1968): Climatology and the World Climates, Macmillan, London.

Reference Websites

- 1. https://earthobservatory.nasa.gov/
- 2. https://mausam.imd.gov.in/
- 3. https://www.weatheronline.in/
- 4. https://earthexplorer.usgs.gov/
- 5. <u>https://www.nhc.noaa.gov/satellite.php</u>

Formative Assessment		
Assessment Occasion / type	Weightage in	
	Marks	
Case studies	30%	
Assignment	20%	
CIA	50%	
Total	100%	

B.A./ B.Sc. Semester II PRACTICAL

Title of the Course : Weather Analysis Code: 126BSC02GEGOEC02L

Number of practical Credits	Number of practical hours/ semesters	Number of practical h week	ours/
2	52 hrs 4 hrs		
Co	ontent of Practical Course	2	52 Hrs.
Content of Practical Course 1: List of Experiments to be conducted Conduct all exercises with Goal, Procedure, devices, and findings.		5	
Exercise 1: Structure and functions of the Indian Meteorological Department (IMD).		3	
Exercise 2: Collection of temperature data from IMD website.			4
Exercise 3: Plotting of downloaded temperature data using graphical methods-line graph.		4	
Exercise 4: Centigrade and Fahrenheit thermometer for measuring temperature.		4	
Exercise 5: Mercurial Barometer and Aneroid Barometer for measuring atmospheric pressure		4	
Exercise 6: Wind Vane and cup-anemometer.		4	
Exercise 7: Wet and Dry bulb thermometer for measuring humidity		4	
Exercise 8: Rainguage- Dial type for measuring rainfall		4	
Exercise 9: Rainfall Trend Analysis(monthly and annual)		4	
Exercise 10: Interpretation of Indian Daily Weather charts.(Each one of Four seasons) Note: Students are expected to download weather charts of the four seasons.		12	

Formative Assessment		
Assessment Occasion/ type	Weightage in	
, , , ,	Marks	
Quiz	30%	
Assignment	20%	
CIA	50%	
Total	100%	

OPEN ELECTIVE (OE) - 1 THEORY

Title of the Course: Introduction to Human Geography**Code :** 126BSC02GEGDSC01T

Number of Theory Credits	Number of lecture hours/ semester	Number of lectu hours/week	re
3	42 hrs	3 hrs	
 Course Outcomes: Students will learn the world interact. Students will be fan trade and their imp The student will de 4. Understand popula 	how human, physical, and env miliarized with economic proc pacts on economic, cultural ar escribe what geography and h ation dynamics and migration	vironmental component cesses such as globalizat nd social activities. uman geography are.	ts of tion,
Course Objectives: This course aims to 1. Understand the bas 2. Study population a 3. Introduce economic development of the	sics concepts of human geogra ttributes and dynamic nature ic, cultural, and trade activitie e region	iphy of it s and their impact on th	ie
	Content of Theory Course		56Hrs
Unit — 1 Introduction t	o Human Geography		10
Nature and scope, Develo Environmental Determin determinism) Approaches to human geo regional analysis Approa organization Approach. M Approach, Radical Appro Behavioral Approach, Po Fields and sub fields in H	opment ism and Possiblism, Neo deter ography: Exploration and Des ch, Areal Differentiation Appr Modern approaches: Welfare o ach, st Modernism in geography uman geography	rminism (stop and go criptive approach, roach, Spatial or Humanistic	
Unit — 2 Geographical	Analysis of Population		16
Distribution and Growth of Population Density of population: meaning and Types: Arithmetic Density and Physiological Density. Regional distribution of Density of Population. Carrying capacity and sustainability, population Pyramid. Population Theories: Malthus Theory of Population, Demographic Transition Theory Population Movement: Migration, Raventein's Law of Migration, Factors of population Migration, Economic Push and Pull factors, Cultural Push and Pull Factors, Environmental Push and Pull Factors. Migration Types: Immigration and Emigration, Internal and International Migration			
Unit — 3 Cultural Patte	erns and Processes		15

Concept of Culture, Material and Non material culture	
Diffusion.	
Languages of the World: Types, Classification and Distribution. Language	
Extinction Religions: Types and Classification. Distribution. Universalizing	
Chinese religion, Shintoism, Judaism. The Major tribal population of the world.	
Unit — 4 Human Economic Activities, Development and Settlements	15
Primary Economic Activities — Agriculture, Types: Primitive Subsistence, Intensive subsistence, Plantation Agriculture, Extensive Commercial grain cultivation, Mixed Farming, Dairy Farming Secondary and Tertiary Activities: Manufacturing, classification — based on size — Small Scale and Large scale. Based on Raw material — Argo-based, Mineral based, Chemical Based and Forest based. Industrial Regions of the world. Tertiary Activities: Types: Trade and commerce, Retail Trading services, Wholesale trading. Transport and communications: Factors, communication services — Telecommunication. Services: Informal and Non formal sector. Information technology and service. Human Settlements: Factors, Classification, Types and Patterns: Rural, Urban. Compact or Nucleated and Dispersed settlements. Rural settlement Patterns: linear, rectangular, circular, star shaped, T shaped. Urban settlements: urbanism, classification — population size, occupation structure, Administration. functional classification of urban centres, types of urban actilements: toums aity comunication of urban centres, types of	

References

- 1 . Hartshorne, T. A., & Alexander, J. W. (2010). Economic Geography. New Delhi: PHI Learning.
- 2. Knox, P., Agnew, J., & McCarthy, L. (2008). The Geography of the World Economy. London: Hodder Arnold.
- 3. Lloyd, P., & Dicken, B. (1972). Location in Space: A Theoretical Approach to Economic Geography. New York: Harper and Row.
- 4. Siddhartha, K. (2000). Economic Geography: Theories, Process and Patterns, New Delhi: Kisalaya Publications.
- 5. Smith, D. M. (1971). Industrial Location: An Economic Geographical Analysis, New York: John Wiley and Sons.

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Quiz	30%	
Assignment	20%	
CIA	50%	
Total	100%	

OPEN ELECTIVE (OE) - 2 THEORY

Title of the Course: Fundamentals of Natural disasters Code : 126BSC02GEG0EC02T

Number of Theory Credits	Number of lecture hours/ semester	Number of lec hours/ week	ture
3	42 hrs	3 hrs	
Course Outcomes: Students will be able to 1. Understand the basics concep 2. Stud t es of natural disasters a	ts in natural disasters nd their effects		
 Course Objectives: 1. The paper is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control. 2. Introduce a holistic classification of natural disasters considering the Ear Sciences 3. Demonstrate the devastating effect of natural disasters to society , 			arth
Content of Theory Course 1		42 Hrs	
Unit — 1 Introduction to Natural Disaster		10	
Meaning, definition, and scope. Lithosphere and Natural Disasters Earthquakes and volcanoes, Landslides and Avalanches			
Unit — 2 Atmosphere and Natural Disasters		10	
Heat wave and wildfire, Cloud burst, hailstorm, Drought and famines			
Unit – 3 Hydrosphere and Natural Disaster		10	
Tsunami, Hurricanes and cyclones, Floods and flash floods			
Unit – 4 Biosphere and Natural D	isasters		12
Epidemics and pandemics, Covid Techniques and technology to mit	-19 and its effects tigate natural disasters		

References

- 1. Dr. Mrinalini Pandey Disaster Management Wiley India Pvt. Ltd.
- 2. Tushar Bhattacharya Disaster Science and Management McGraw Hill Education (India) Pvt. Ltd.
- 3. Jagbir Singh Disaster Management: Future Challenges and Opportunities K W Publishers Pvt. Ltd.
- 4. J. P. Singhal Disaster Management Laxmi Publications.
- 5. Shailesh Shukla, Shamna Hussain Biodiversity, Environment and Disaster Management Unique Publications

6. C. K. Rajan, Navale Pandharinath Earth and Atmospheric Disaster Management: Nature and Manmade B S Publication

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Quiz	30%	
Assignment	20%	
CIA	50%	
Total	100%	

OPEN ELECTIVE (OE) - 3 THEORY

Title of the Course: Climate Change: Vulnerability and Adaptation **Code :** 126BSC02GEG0EC03T

Number of Theory Credits	Number of lecture hours/ semester	Number of lect hours/ week	ure
3	42 hrs	3 hrs	
Course Outcomes: 1. This course is to make understand the basic concepts of Climate-Weather systems and to impart necessary skills of Climate change, and its impact on e systems to the students. So that, students acquire basic understanding of the climate systems of the earth and to study the applications of the Geoinforma			her on earth f the rmatics
 Course Objectives: 1. To provide a sound under multiple viewpoints 2. Demonstrate knowledg potential strategies 3. For alleviating their neg 4. Define key terms (e.g., a mainstreaming) 5. Study application of the Adaptation 	erstanding of the econom e of the projected impacts gative impacts. daptation, resilience, vulr e Geoinformatics in the Cl	ics of climate chan s of climate change nerability, imate Chan e and	nge from e and
Conten	t of Theory Course		42 Hrs
Unit — 1 Introduction to Clin	mate Change		10
Meaning and concept of climat Origin of atmosphere. Concept Evidence of Climate Change: H climate events: Meteorologica effect, Greenhouse Gases, Glob Extreme weather and climate precipitation, Hurricanes, Tor	te change. ts of weather and climate. Iistorical and current wea I, Lithogenic and biologica oal Warming. event: Drought, Extreme I nadoes and Wildfire.	ather and Il, Greenhouse Heat, Extreme	
Unit — 2 Causes and Effect o Natural cause: Solar variation, orbital change and internal va Human causes: Burning fossil and industries. Impacts of climate change: Wa health, vegetation, economy an International efforts to contro framework and provisions, Ea summit, Kyoto Protocol, Coper	of climate change Volcanic eruption, ocean riability fuel, Deforestation, Intens ater resources, agricultur nd El nino, La Nina and Ar ol the climate change: UNE orth Summit Rio-de-Janein nhagen summit and Doha	currents, Earth sive Agriculture, e, human ctic Oscillation FCC its policy ro, World Conference	10

Unit — 3 Climate change Vulnerability and Adaptation Meaning and type of vulnerability Meaning Definition and types of adaptation	
Approaches of adaptation and Adaptation Strategies.	
Adaptation in different sectors: Agriculture, Forest, Water resources,	
Biodiversity, Disaster Risk Management	10
Unit — 4 Vulnerability Assessment and climate change mitigation Climate change vulnerability assessment Global Initiatives to climate change mitigation: Kyoto Protocol, carbon trading, clean development mechanism, COP. Indian initiative to support climate change mitigation: Improving energy efficiency, Diversification of energy sources, Modifying industrial processes, a multipronged strategy for sustainable development and Clean Development Mechanism (CDM) in India.	12
Case studies: MGNREGA (Mahatma Gandhi National Rural Employment 16 Guarantee Act) potential of generating co-benefits, Vertical Shaft Brick Kiln (VSBK) or Ecokiln	

References

1. Earth: Evolution of a Habitable World, 2nd edn., Cambridge, UK: Cambridge University Press (2013) Jonathan l. Lunine.

- 2. Evolution of the Earth, McGraw-Hill Education; 8th edition (2009) DonaldProthero, Robert Dott, Jr.
- 3. A Textbook of Climatology, Wisdom Press (2015) Tapas BhattacharyaGlobal Warming: The Complete Briefing, Cambridge University Press; 4th edition (2009), John Houghton
- 4. K.Siddahartha (2020): Climatology, Atmosphere, Weather and Climate. Kitaba Mahal Publication, New Delhi.
- 5. K.Siddahartha and others (2014): Basic Physical Geography Kishalaya Publications Pvt, Publication , New Delhi.
- 6. Satapathy. S: Adaptation to Climate Change with a Focus on Rural Areas and India. Indian Ministry of Environment and Forests, Director of the Climate Change Division.
- 7. Patricia Butler, Chris Swanston, Maria Janowiak, Linda Parker, Matt St. Pierre, and Leslie Brandt:Adaptation strategies and Approaches.

8. Ministry of Environment and Forest Government of India: Adaptation to Climate Change with a Focus on Rural Areas and India.

9. Neelam Rana, Anand Kumar, Kavita Syal and Mustafa Ali Khan: Climate Change Mitigation in India

Web Resources

1 . IEA Training Material: Vulnerability and Climate Change Impact Assessment for Adaptation.

- 2. http://www.iisd.org/pdf/2010/iea_training_vol_2_via.pdf
- 3. Guidance on Integrating Climate Change Adaptation into Development Co-operation.
- 4. http://www.oecd.org/dac/43652123.pdf
- 5. Mainstreaming Climate Change Adaptation into Development Planning: A Guide for

Practitioners.

- 6. http://www.unep.org/pdf/mainstreaming-cc-adaptation-web.pdf
- 7. CGE Climate Change Training Materials.
- 8. <u>http://unfccc.int/national reports/nonannex i natcom/training material/methodol</u> ogical_documents/items/349.php
- 9. Compendium on Methods and Tools to Evaluate Impacts of, and Vulnerability and Adaptation to, Climate Change.
- 10. <u>http://unfccc.int/adaptation/nairobi_work_programme/knowledge_resources_and</u> publications/items/5457.php
- 1 1 . Centre for climate and Energy solutions. <u>https://www.c2es.org/content/extremeweather-and-climate-change/</u>
- 12. <u>https://www.history.com/topics/natural-disasters-and-environment/history-of-</u>climatechange
- 13. ghttp://www.ozcoasts.org.au/glossary/images/VulnerabilityDiag_AllenConsulting
- 14. ghttp://ccafs.cgiar.org/news/media-centre/climatehotspots
- 15. ghttp://pmindia.nic.in/Pg01-52.pdf

Formative Assessment		
Assessment Occasion/ type Weightage in Marks		
Quiz	30%	
Assignment	20%	
CIA	50%	
Total	100%	

OPEN ELECTIVE (OE) - 4 THEORY

Title of the Course: Basics of Geographic Information Systems (GIS) **Code :** 126BSC02GEG0EC04T

Number of Theory Credits	Number of lecture hours/ semester	Number of lecture hours/ week
3	42 hrs	3 hrs

Course Outcomes:

1. Students are trained to adapt the theoretical concepts in a practical way through the mathematical models of geography.

- 2. Students will have the hands-on training on various modes of spatial and nonspatial data collection, data storage, data analytics, data interpretation and data display through the thematic maps.
- 3. Students are exposed on spatial thinking to solve the geographical problems with range of proven mathematical and statistical models.
- 4. Students can employ in various corporate and government organisation where they deal to solve Geographical problems.

Course Objectives: This course aims to:

- 1. Understand the concept and techniques of the Geographic Information Systems.
- 2. Define the GIS data types and structures.
- 3. Study geo processing and visualization concepts and techniques in GIS.

Content of Theory Course	42Hrs
Unit—I Introduction	10
Emergence of Gl Science, Milestone and Developmental stages in GIS, Definition, scope, role of GIS in digital world; Components, functionalities, merits and demerits, global market, interdisciplinary domains, and its integration with GIS.	
Unit — 2 Geodesy and Spatial Mathematics	10
Cartesian coordinates, latitude, longitudes, formats of angular units, geographical coordinates, Datum: WGS84, vs NAD32. U TM, Aerial Distance measurement using Geographic and projected coordinates, Area, Perimeter, length by coordinates and various international measures.	
Unit - 3 GIS Data and Scale	10
Spatial Data and its structures; sources and types of data collection; data errors, topology of data and relationship. Large Scale vs Small Scale, generalization; precision and accuracy of data-logical consistency and non- spatial data integration	
Unit — 4 Geoprocessing and Visualization	12
Spatial and Non-Spatial Queries, proximity analysis, Preparation of Terrain and Surface models. Hotspot and density mapping. Types of maps, thematic maps andits types, relief maps, flow maps and cartograms. Tabulations: Graphs and Pivot tables.	

References

- 1. An Introduction to Geographical Information Systems Ian Heywood (2011)
- 2. Geographic Information Systems: A Management Perspective Aronoff, S. (1989).
- 3. GIS Fundamentals, Applications, and Implementations Elangovan, K. (2006)
- 4. Introduction to Geographical Information Systems Chang, Kang-Tsung (2015)
- 5. Remote Sensing and GIS Bhatta, B. (2011)
- 6. Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography - Sharma, H.S. (2006)
- 7. Spatial analysis and Location-Allocation Models Ghosh, A. and G. Rushton (1987)
- 8. Geographic Information Systems and Cartographic Modelling Tomlin, C.D. (1990)
- 9. Geographic Information Systems and Science Paul A. Longley, et. al. (2015)
- 10. Geographic Information Systems and Environmental Modelling Clarke, C., K. (2002)

Reference Websites

1. I IRS MOOC programme: <u>https://isat.iirs.gov.in/mooc.php</u>

Formative Assessment		
Assessment Occasion/ type	Weightage in Marks	
Quiz	30%	
Assignment	20%	
CIA	50%	
Total	100%	

INTERNAL ASSESSMENT FOR THEORY

Maximum Marks : 40

S.No.	Particulars	Details	Marks
1	Two Case studies	a. Introduction	
		b. Identification of problem	
		c. Collection of data/Field visit/ Photos	
		d. Analysis and Findings	
		e. Suggestions/Recommendation/Conclusion	
		Total	20
2.	Two Internal Test	(2 x 10) Total	20
		Grand Total	40

Area of Case Study

The student should carry out their case study by selecting one of the below mentioned field within the vicinity of 20 kms from their institute.

1. Agricultural region (rainfed / irrigated)	2. Urban area
3. Rural area	4. Watershed area
5. Industrial region	6. Forest region
7. Population	8. Landscape
9. Tourism	10. Natural elements
11. Global warming	12. Market study

Question Paper Pattern for Theory

Department of Geography

Sub:

Code:

Duration : 2 hours

Instructions:

Answer the questions from every Section i.e. A, B and C

Section A	Answer any Ten Questions out of Twelve questions	2 X 10 = 20 Marks
	(Minimum two questions from each unit)	
Section B	Answer any Four Questions out of Six questions	5 X 4 = 20 Marks
	(Minimum one question from each unit)	
Section C	Answer any Two Questions out of Four questions	10 X 2 = 20 Marks
	(One Question from Each Unit)	
	Total	60 Marks

Question Paper Pattern for Practical

Department of Geography

Sub: Maximum Marks: 25 Code:

Duration : 2 hours

Instructions:

Answer all the sections

	Total	25 Marks
Section C	Answer any One Question out of Three questions	7 X 1 = 7 Marks
Section B	Answer any Two Questions out of Four questions	5 X 2 = 10 Marks
Section A	Answer any Two Questions out of Four questions	4 X 2 = 8 Marks

Maximum Marks: 60

Common Syllabus for

B.Sc and BCA

Programme for First

and Second Semester

SEMESTER – I

Details of AECC Language-II Offered by Science Stream students that the Students can be opt any one among theFollowing Subjects

Sl.	Department	Categor	Course Code	Title
No		y		
•				
1	Kannanda (L1)	AECC-I	126BSC01LANAEC01T	Kannada
2	Functional	AECC-I	126BSC01LANAEC02T	Functional Kannada
	Kannanda (L1)			
3	English (L2)	AECC-II	126BSC01LANAEC03T	Generic English -I
4	Hindi (I 2)	AECC-II	126COM01LANAEC04T	Collection of
	$\operatorname{THird}\left(\mathrm{L}2\right)$			Prose+Grammar
5	Sanskrit (I 2)	AECC-II	126COM01LANAEC05T	Sanskrit Poetry, Grammar
	Saliskilt (L2)			and Comprehension
6	Marathi (I 2)	AECC-II	126COM01LACAEC06T	Wangmayaprakar:
	Maraun (L2)			Katha+Jahiratmasuda
7	Urdu (I 2)	AECC-II	126COM01LANAEC07T	Drama aur
	Oluu (L2)			MukhtasarKahaniyan
8	A rabic $(I 2)$	AECC-II	126COM01LANAEC08T	An Nasrul Quadeem,
	Alabic (L2)			Ashsherul Jadeed

Details of SEC-1, VBC -1, VBC-2 Subjects studied by Science Students in Semester-I

Sl.No.	Category	Course Code	Title
1	SEC 1	126COM01XXXSEC01T	DigitalFluency
2	VBC 1	126COM01XXXVBC01B	Yoga/ Sports
3	VBC 2	126COM01XXXVBC02T	Health & Wellness



ಬಾಗಲಕೋಟ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ರಾಜ್ಯ ಸಾರ್ವಜನಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ) ಮುಧೋಳ ರಸ್ತೆ, ಜಮಖಂಡಿ–587301 ಬಾಗಲಕೋಟೆ ಜಿಲ್ಲೆ



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Tel No: (08353)295123, 295124

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ ಮೊದಲ ಸೆಮಿಸ್ತರ್ ಬಿ.ಎಸ್ರಿ

(Ability Enhancement Compulsory Course)

Language-1

ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಆಂತರಿಕ ಮತ್ತು ಥಿಯರಿ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಮೊದಲ ವರ್ಷಕ್ಕಾಗಿ ಅಂದರೆ 2021–22ನೇ ಸಾಲಿನ ಮೊದಲ ಮತ್ತು ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್ ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಈ ಮುಂದಿನಂತಿರುತ್ತದೆ.

1. ಆಂತರಿಕ ಅಂಕಗಳ ಮಾದರಿ ಮತ್ತು ನೀಡುವ ವಿಧಾನ : ಸಮಗ್ರ ಮತ್ತು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಮಾದರಿಯನ್ನು ಅನುಸರಿಸಬೇಕಾಗಿರುತ್ತದೆ. ರಚನಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನ (Formative Assessment) ಅಂತಿಮ ಹಂತದಲ್ಲಿ ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನ (Summative Assessment) ಕ್ರಮದಂತೆ ಆಂತರಿಕ ಅಂಕಗಳನ್ನು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನದ ವರದಿ ಮತ್ತು ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನದ ವರದಿಯ ಆಧಾರದ ಮೇಲೆ ನೀಡುವುದು.

- i. ಪತ್ರಿಕೆ ಒಟ್ಟು 100 ಅಂಕಗಳು
- ii. ಘಟಕ 1ರ (Component 1- C1) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಆಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ ಮೊದಲೆರಡು ತಿಂಗಳು)
- iii. ಘಟಕ 2ರ (Component 2- C2) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಆಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ ನ ನಂತರದೆರಡು ತಿಂಗಳು)
- iv. ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಗೆ 60 ಅಂಕಗಳು.

2. Evaluation process of IA marks shall be as follows:

- a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course/s and within 45 working days of semester program.
- b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum / project work etc. This assessment and score process should be based on completion of remaining 50 percent of syllabus of the courses of the semester.
- C) During the 17th 19th week of the semester, a semester end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.
- d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator / Principal. The Program Coordinator / Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher but before commencement of the concerned

semester end examinations.

- e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be stamped by the concerned department using their department seal at the time of conducting tests / assignment / work etc.
- f) The outline for continuous assessment activities for Component-1 (C1) and Component -2 (C2) of a course shall be as under

Activities	C1	C2	Total Marks
Session Test	10% marks	10% marks	20%
Seminars/Presentations/Activity	10% marks		10%
Case study /Assignment / Field work / Project work etc.		10% marks	10%
Total	20% marks	20% marks	40%

Conduct of Seminar, Case study / Assignment, etc. can be either in C1 or in C2 component at the convenience of the concerned teacher.

Semester & Course	Course	Course Outcome
1 st Semester Language-1	ಕನ್ನಡ	ಬಿ.ಎಸ್ಸಿ ಕನ್ನಡ ಪಠ್ಯಕ್ರಮವು ಕನ್ನಡ ನಾಡು-ನುಡಿ ಪ್ರಜ್ಞೆ ಭೂಮಿ, ವೈಜ್ಞಾನಿಕ ಮನೋಧರ್ಮ ಮತ್ತು ಸಂಕೀರ್ಣಗಳೆಂಬ ನಾಲ್ಕು ಥೀಮ್ ಗಳನ್ನು ಭೂಮಿಕೆಯನ್ನಾಗಿಟ್ಟುಕೊಂಡು ವಿನ್ಯಾಸಗೊಳಿಸಲಾಗಿದೆ. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಮರ್ಥ್ಯ ಸಂಪರ್ಧನೆಗೆ ಅಗತ್ಯವಿರುವ ಭಾಷಿಕ, ಬೌದ್ಧಿಕ, ಶೈಕ್ಷಣಿಕ, ವ್ಯವಹಾರಿಕ, ನೈತಿಕ ಮತ್ತು ಸಾಂಸ್ಕೃತಿಕ ಕಾಳಬಿಗಳನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಮಾನವೀಕರಣ ಪ್ರಕ್ರಿಯೆಯ ಉಪಕ್ರಮವಾಗಿ ಚರ್ಚೆಗೆ ಚೌಕಟ್ಟನ್ನು ಕಲ್ಪಿಸಿಕೊಡಲಾಗಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಆಸಕ್ತಿ ಮೂಡಿಸಲು ವಿಭಿನ್ನ ಬೋಧನೋಪಕರಣಗಳನ್ನು ಹಾಗೂ ಜ್ಞಾನದ ಇತರ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳಲು ಔಚಿತ್ಯವಾದ ವಾತಾವರಣವನ್ನು ಸೃಷ್ಟಿಸಲಾಗಿದೆ.

Model Question Paper

M	[ax]	Marks: 60) Max										Time: 2	hrs		
1.	ಪ್ರತಿ	ಘಟಕದಿಂದ	ಒಂದರಂ	ತೆ ನ	ಗಾಲ್ಕನ್ನು	ಕೇಳಿ	ಮೂರ	ರಕ್ಕೆ ೮	ಉತ್ತರಿಸ	ಲು ಹೇ	ಳುವುದು.		10X3=30)		
2.	ಪ್ರತಿ	ಘಟಕದಿಂದ	ಒಂದರಂ	ಂತೆ ನ	ನಾಲ್ಕನ್ನು	ಕೇಳಿ	ಮೂ	ರಕ್ಕೆ ೮	ಉತ್ತರಿಸ	ಗಲು ಹೇ	ಳುವುದು		5X3=15			
3.	ఎల్ల	ಘಟಕಗಳಿಂದ	ರ ಒಟ್ಟು	పళు	ಪ್ರಶ್ನೆಗಳ	¹ ನ್ನು	ಕೇಳಿ (ಲಘು	ಪ್ರಶ್ನೆ	ಅಥವಾ	ಟಿಪ್ಪಣಿ	ಅಥವಾ	ಸಂದರ್ಭದ	ಸ್ವಾರಸ್ಯ	ಅಥವಾ	ಕಾವ್ಯದ
ප	ರ್ಧವ	ಗ್ಯಾಖ್ಯಾನ, ಸಾ	ರಾಂಶ) ಕ	ಐದಕ್ಕೆ	, ಉತ್ತರಿ:	ಸಲು	ಹೇಳು	ವುದು					3X5=15			

ಬಾಗಲಕೋಟ



ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎಸ್ಪಿ (Ability Enhancement Compulsory Course)

Language-1

(ವಾರಕ್ಕೆ 4ಗಂಟೆಗಳ ಪಾಠ, 3 ಕ್ರೆಡಿಟ್ಗಳ ಪತ್ರಿಕೆ, ಒಟ್ಟು ಅಂಕಗಳು-100, ಥಿಯರಿ ಪರೀಕ್ಷೆಗೆ-60 ಅಂಕಗಳು, ಆಂತರಿಕ ಗುಣಾಂಕಗಳಿಗೆ-40 ಅಂಕಗಳು, ಸಮಿಸ್ಟರ್ ಅಂತ್ಯಕ್ಕೆ 2 ಗಂಟೆಗಳ ಪರೀಕ್ಷೆ, ಆಂತರಿಕ ಗುಣಾಂಕಗಳ ಕುರಿತು ನೀಡಿದ ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಪದ್ಧತಿಯನ್ನು ಮೇಲೆ ತಿಳಿಸಿರುವಂತೆ ನಡೆಸುವುದು.)

- **ಘಟಕ 1 : ಕನ್ನಡ ನಾಡು–ನುಡಿ ಪ್ರಜ್ಞೆ** 1. ಕನ್ನಡಾಂಬೆಯ ಹಿರಿಮೆ ಬೆನಗಲ್ ರಾಮರಾವ್
 - 2. ಹೊತ್ತಿತೊ ಹೊತ್ತಿತೊ ಕನ್ನಡ ದೀಪ ಸಿದ್ಧಯ್ಯ ಮರಾಣಿಕ
 - 3. ಕರ್ನಾಟಕದ ಇತಿಹಾಸ ಮತ್ತು ಕನ್ನಡ ಸಾಹಿತ್ಯ ಎಂ. ಚಿದಾನಂದ ಮೂರ್ತಿ
 - 4. ಕನ್ನಡ ಸಂವರ್ಧನೆ ಡಿ. ಆರ್. ನಾಗರಾಜ

ಘಟಕ - 2 : ಭೂಮಿ

- 1. ಬೀಜ ಮತ್ತು ಭೂಮಿ ವಂದನಾ ಶಿವ
- 2. ನೆಲಮುಗಿಲು ಚನ್ನವೀರ ಕಣವಿ
- 3. ನಮ್ಮೂರ ಕೆರೆ ಶಿವರಾಮ ಕಾರಂತ
- 4. ನನ್ನೊಳು ನದಿಯೋ ನದಿಯೊಳು ನಾನೋ ಪಾರ್ವತಿ ಪಿಟಗಿ

ಘಟಕ – 3 : ವೈಜ್ಞಾನಿಕ ಮನೋಧರ್ಮ

- 1. ಜ್ಯೋತಿಷ್ಯ ಅರ್ಥಮೂರ್ಣವೋ ಅರ್ಥರಹಿತವೋ ಎಚ್. ನರಸಿಂಹಯ್ಯ
- 2. ದೇವರು ಪೂಜಾರಿ ಕುವೆಂಪು
- 3. ಮೂರು ಘಂಟೆಗಳು ಎಚ್. ಎಸ್. ಕೆ.
- 4. ವಿಜ್ಞಾನ ಪ್ರಶ್ನೆ : ಸಹಸ್ರಬುದ್ಧೆ (ಅನು: ಕೆ. ಮಟ್ಟುಸ್ವಾಮಿ)

ಘಟಕ – 4 : ಸಂಕೀರ್ಣ

- 1. ಸೋದರರ ಸಮರ ರತ್ಯಾಕರವರ್ಣೀ
- 2. ಬಿತ್ತನೆ ಹಾಡು ಜಾನಪದ ಕವಿತೆ
- 3. ಗಡ್ಡೇದ ಬಸವಣ್ಣ ಜಾನಪದ ಕತೆ (ಬೆಳಗಾವಿ ಜಿಲ್ಲೆಯ ಸಣ್ಣಕತೆಗಳು ಟಿ. ಎಸ್. ರಾಜಪ್ರ)
- 4. ಸಾಹಿತ್ಯದಲ್ಲಿ ವೈಚಾರಿಕತೆ ಕೀರ್ತಿನಾಥ ಕುರ್ತಕೋಟಿ

ಸೂಚನೆ : ಬಾಗಲಕೋಟ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಪ್ರಸಾರಾಂಗದಿಂದ ಸದರಿ ಪಠ್ಮಕ್ರಮವು ಪಠ್ಯಮಸ್ಥಕ ರೂಪದಲ್ಲಿ ಪ್ರಕಾಶನಗೊಂಡಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು ಪಠ್ಯಮಸ್ತಕವನ್ನು ಅಥವಾ ಸ್ವತಂತ್ರವಾಗಿ ಅಧ್ಯಯನ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಪಠ್ಯಬೋಧನೆಯನ್ನು ಮಾಡುವುದು.

Course Code : 126BSC01LANAE C02T

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎ/ಬಿ.ಎಸ್.ಡಬ್ಲೂ/ಸಿ.ಸಿ.ಜೆ (Ability Enhancement Compulsory Course) Language-1

ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಆಂತರಿಕ ಮತ್ತು ಥಿಯರಿ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಮೊದಲ ವರ್ಷಕ್ಕಾಗಿ ಅಂದರೆ 2021–22ನೇ ಸಾಲಿನ ಮೊದಲ ಮತ್ತು ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್ ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಈ ಮುಂದಿನಂತಿರುತ್ತದೆ.

 ಆಂತರಿಕ ಅಂಕಗಳ ಮಾದರಿ ಮತ್ತು ನೀಡುವ ವಿಧಾನ : ಸಮಗ್ರ ಮತ್ತು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಮಾದರಿಯನ್ನು ಅನುಸರಿಸಬೇಕಾಗಿರುತ್ತದೆ. ರಚನಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನ (Formative Assessment) ಅಂತಿಮ ಹಂತದಲ್ಲಿ ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನ (Summative Assessment) ಕ್ರಮದಂತೆ ಆಂತರಿಕ ಅಂಕಗಳನ್ನು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನದ ವರದಿ ಮತ್ತು ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನದ ವರದಿಯ ಆಧಾರದ ಮೇಲೆ ನೀಡುವುದು.

- i. ಪತ್ರಿಕೆ ಒಟ್ಟು 100 ಅಂಕಗಳು
- ii. ಘಟಕ 1ರ (Component 1- C1) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಅಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ ನ ಮೊದಲೆರಡು ತಿಂಗಳು)
- iii. ಘಟಕ 2ರ (Component 2- C2) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಆಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ನ ನಂತರದೆರಡು ತಿಂಗಳು)
- iv. ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಗೆ 60 ಅಂಕಗಳು.

2. Evaluation process of IA marks shall be as follows:

- a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course/s and within 45 working days of semester program.
- b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum / project work etc. This assessment and score process should be based on completion of remaining 50 percent of syllabus of the courses of the semester.
- c) During the 17th 19th week of the semester, a semester end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.
- d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator / Principal. The Program Coordinator / Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher but before commencement of the concerned semester end examinations.
- e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be stamped by the concerned department using their department seal at the time of conducting tests / assignment / worketc.

f) The outline for continuous assessment activities for Component-1 (C1) and Component -2 (C2) of a course shall be as under

Activities	CI	C2	Total Marks
Session Test	10% marks	10% marks	20%
Seminars/Presentations/Activity	10% marks		10%
Case study /Assignment / Field work / Project work etc.		10% marks	10%
Total	20% marks	20% marks	40%

Conduct of Seminar, Case study / Assignment, etc. can be either in C1 or in C2 component at the convenience of the concerned teacher.

Semester & Course	Course	Course Outcome
1 st Semester Language-1	ಕನ್ನಡ	ಕನ್ನಡೇತರ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಕನ್ನಡ ಜ್ಞಾನವನ್ನು, ಕನ್ನಡ ಭಾಷಿಕ, ವ್ಯವಹಾರಿಕ ಹಾಗೂ ಸಾಂಸ್ಕೃತಿಕ ಜ್ಞಾನವನ್ನು ತುಂಬುವುದು.

Model Question Paper

Max Marks: 60 Max

Time: 2 hrs

ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 10x3=30
 ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 5x3=15

3. ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ ಒಟ್ಟು ಏಳು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ (ಲಘು ಪ್ರಶ್ನೆ ಅಥವಾ ಟಿಪ್ಪಣಿ ಅಥವಾ ಸಂದರ್ಭದ ಸ್ವಾರಸ್ಯ ಅಥವಾ ಕಾವ್ಯದ ಅರ್ಥವ್ಯಾಖ್ಯಾನ, ಸಾರಾಂಶ) ಐದಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 3X5=15

ಎಲ್ಲಾ ಸ್ನಾತಕ ಪದವಿಗಳಿಗೆ ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ವಿಷಯ

(Ability Enhancement Compulsory Course)

Language-1

(ವಾರಕ್ಕೆ 4ಗಂಟೆಗಳ ಪಾಠ, 3 ಕ್ರೆಡಿಟ್ಗಳ ಪತ್ರಿಕೆ, ಒಟ್ಟು ಅಂಕಗಳು-100, ಥಿಯರಿ ಪರೀಕ್ಷೆಗೆ-60 ಅಂಕಗಳು. ಆಂತರಿಕ ಗುಣಾಂಕಗಳಿಗೆ-40 ಅಂಕಗಳು, ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯಕ್ಕೆ 2 ಗಂಟೆಗಳ ಪರೀಕ್ಷೆ, ಆಂತರಿಕ ಗುಣಾಂಕಗಳ ಕುರಿತು ನೀಡಿದ ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಪದ್ಧತಿಯನ್ನು ಮೇಲೆ ತಿಳಿಸಿರುವಂತೆ ನಡೆಸುವುದು.)

ಮೊದಲನೆಯ ಸೆಮಿಸ್ವರ್

ಭಾಗ–1

- 1. ಕನ್ನಡ ಅಕ್ಷರ ಮಾಲೆ
- 2. ಕಾಗುಣಿತ ಮಾಲೆ
- 3. ಒತ್ತಕರಗಳು
- 4. ಅಂಕಿಗಳು
- 5. ನಾಮಪದ ಹಾಗೂ ಸರ್ವನಾಮಗಳು
- 6. ಕ್ರಿಯಾಪದಗಳು
- 7. ಕೆಲ ದಿನ ಬಳಕೆಯ ದಿನಸಿ ಪದಾರ್ಥಗಳು
- 8. ಮನೆಯ ಕೈಬಳಕೆಯ ಕೆಲ ವಸ್ತುಗಳು
- 9. ಸಂಬಂಧವಾಚಕ ಪದಗಳು
- 10. ಮಾನವ ಹಾಗೂ ಪ್ರಾಣಿ-ಪಕ್ಷಿಗಳ ಶಾರೀರಿಕ ವಾಚಕ ಪದಗಳು
- 11. ತಿಂಡಿ-ತಿನಿಸು ಆಹಾರ ಪದಾರ್ಥಗಳು
- 12. ಪಶು, ಪಕ್ಷಿ ಹಾಗೂ ವೃಕ್ಷವಾಚಕ ಪದಗಳು

ಭಾಗ-2

- 1. ಕರ್ನಾಟಕದ ಭೌಗೋಳಿಕ ಲಕ್ಷಣ
- 2. ಕರ್ನಾಟಕದ ಜಿಲ್ಲೆಗಳು
- 3. ಪ್ರವಾಸಿ ತಾಣಗಳು
- 4. ವನ್ಯ ಸಂಪತ್ತು
- 5. ಐತಿಹಾಸಿಕ ತಾಣಗಳು
- 6. ವಿಶ್ವವಿದ್ಯಾಲಯಗಳು
- 7. ಬೆಳೆಗಳು
- 8. ಕನ್ನಡದ ಪ್ರಸಿದ್ಧ ಕವಿಗಳು ಹಾಗೂ ಅವರ ಕೃತಿಗಳು
- 9. ಪ್ರಸಿದ್ಧ ಕಲಾವಿದರು
- 10. ಕರ್ನಾಟಕದ ಪ್ರಸಿದ್ಧ ಅರಸು ಮನೆತನಗಳು

ಸೂಚನೆ : ರಾಣಿ ಚನ್ನಮ್ಮ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆಯ ಅಭ್ಯಾಸ ಮಂಡಳಿಯು ಡಾ. ವಿ. ಎಸ್. ಮಾಳಿ ಹಾಗೂ ಡಾ. ಬಿ. ಎಂ. ಪಾಟೀಲ ಅವರು ಸಿದ್ಧಪಡಿಸಿರುವ E-bookನ್ನು ಇದರೊಟ್ಟಿಗೆ ಲಗತ್ತಿಸಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು E-bookನ್ನು ಅಥವಾ ಸ್ವತಂತ್ರ ಅಧ್ಯಯನ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಪಠ್ಯಬೋಧನೆಯನ್ನು ಮಾಡಲು ಅವಕಾಶ ಕಲ್ಪಿಸಿಕೊಡಲಾಗಿದೆ.

SEMESTER – I

Course Code: 126BSC01LANAEC03T Course Title: Generic English – I (L2) Bachelor of Science (Basic/Hons) Programme/ Bachelor of Computer Applications (Basic/Hons.)

Year	2023	Course Code: 126BS	Course Code: 126BSC01LANAEC03T					
	-24	Course Title: Gener	ic English – I	-				
Sem.	Ι		C C		Hours	4		
Course	e Pre-re	equisites, if any	NA					
Forma	tive As	t Marks: 60						
Cours	se							
Outco	mes	1. Acquire the LSRW	(Listening, Speaking, Reading, and Writing) skills.					
		2. Learn to appreciate	literary texts.					
		3. Obtain the knowled	lge of literary devices and genres.					
		4. Acquire the skills of	f creativity to express one's experiences.					
		5. Know how to use d	igital learning tools.					
		6. Be aware of their s	ocial responsibilities.					
		7. Develop critical thi	nking skills.					
		8. Develop gender ser	nsitivity					
		9. Increase reading sp	eed, analytical skills and develop presentation skills.					
		10. Become employal	ble with requisite professional skills, ethics and values					
Unit N	No.		Course Content	Suggested Pe	dagogy	60 Hours		
		1. Water the Elixir of	life – C. V. Raman	LecturesTutorials		15 hrs		
Unit I		2. Spoken English and	d Broken English - G. B. Shaw					
		3. Tiger in the Tunnel	Group Discussion					
		1 1 1 000 (0		T (T (' 1		0.1		
TT.: 14 T	Lectures Tutorials		9 hrs					
Unit I	L	2. To India My Nativ	e Land – Henry Derozio	Group Discussion				
		3. The Road not Take	n by Kobert Frost	Oroup Discussion				
1						1		

Unit III	Introducing One self, Introducing others, Requests, Offering help, Lectures Tutorials					
Unit III	Congratulating, Enquiries, Seeking permission Giving	nstructions to do a				
	task,	Group Dis	scussion Role Play			
	1. Word class (Nouns, Adjectives, Verbs, and Adverbs)	Lectures 7	Tutorials 24	0 hrs		
	2. Use of Articles					
	3. Use of Prepositions (Place, Time, Position)	scussion				
	4. Asking Yes/No Questions,					
	5. Asking Wh Questions					
Unit IV	6. Using Indirect Questions for Polite English					
	7. Asking Tag Questions: for affirmation					
	8. Asking Negative Questions: for Confirmation.	8. Asking Negative Questions: for Confirmation.				
	Recommended Lear	ning Resources				
Print	1. Vijay F Nagannawar and S. B. Biradar ed. New Hori	zon, Textbook prescribed for B. A	A. and BSW			
Resources	Programme under CBCS, Rani Channamma University	, Belagavi, 2021.				
	2. Vijay F Nagannawar and S. B. Biradar ed English St	ars, Textbook prescribed for BCc	om and BBA			
	Programme under CBCS, Rani Channamma University	, Belagavi, 2021.				
	3. Dr. S. B. Biradar and Prof. Vijay F Nagannawar ed.	English Gems, Textbook prescrib	ed for B. Sc. and BCA			
	Programme under CBCS, Rani Channamma University	, Belagavi, 2021.				
	4. Quirk Randolph, Sidney Greenbaum, Geoffrey Leec	n &Jan Svartvik. A Comprehensi	ve Grammar of the			
	English Language General Grammar. Longman.					
	5. Herring, Peter. Complete English Grammar Rules. C	e English Grammar Rules. Create space Independent Pub, California, 2016.				
	6. Jain Charul, Pradyumnasinh Raj & Yunus Karbharj.	English Skills for Academic Purp	oses. Macmillan			
	Education. London, 2017					
Digital	http://orelt.col.org/module/unit/4-grammar-improving-comp	osition-skills				
Resources	https://www.academia.edu/26724441/A_Concise_Grammar_	for_English_Language_Teachers.				
	https://www.efluniversity.ac.in/EnglishPro.php					
	https://www.britishcouncil.in/.					
Question Pa	per Pattern					
I. 10 o	bjective questions 5 from Unit I and 5 from Unit II	10x01=10				
II. 01 e	ssay type question out of 2 from Unit I	01x10=10				
III. 01 e	ssay type question out of 2 from Unit II	01x10=10				
IV. 02 q	uestions out of 4: from Unit III	02x05=10				
V. 04 L	anguage Activity out of 6: from Unit IV	04x05=20				
Total		60				

SEMESTER – I

SEMESTER – I Ability Enhancement Compulsory Language Courses I Semester - BSc/BCA (AECC: Language-II)

Subject: Hindi

Course Code: 126COM01LANAEC04T

Name of the Program: Bachelor of Commerce (B.Sc/BCA)											
	Course Code: 126COM01LANAEC04T Collection of Prose + Grammer										
Course Credits No. of Hours per Week Total No. of Teaching I											
3 Cr	edits	3+1+0	64 Hrs								
Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc											
	Course C	outcomes: On successful completion of t	the course, the Students	s will be able							
	to	_									
	1. हहद ी	गढ़म की ववलबन्न ववधाओ से नरयओित ह	गे।								
	2. गद्म के अ	ाध्ममन सेओयनात्मक रेखन भेरुओि उलन्न ह गी।									
	3. हहाद	ी ी ब ाषा के ओे ी दु स्वरून क सभइ	िंगे।								
	4. बाषा क	ओिर का ववकास ह गा।									
Module		Syllabus	Suggested	Teaching							
			Pedagogy	Hours							
Ι	नूतन गद्म से	ोग्रह (गद्म सॊकरन) के नाठ क्र. 1,2,3	1. कंा व्याख्यान	16							
II	नूतन गद्म र	नोग्रह (गद्म सोकरन) के नाठ क्र. 4,5,6	2. ओसवादएओवफहस ३	16							
ш	् नतन गटा भ	गिर (गरा मोलग्न) के नाठ क 780									
		ואפ (יוא גוואיגיו) אי ווט אי. 1,0,5	4. ओयनात्मक <u>16</u>								
IV	ओी ब्दब े द	र- सॊऻंा, ओ स न सः्ीीाभ, ओवओीषेे ण		16							

Recommended Learning Resources

1. नूतन गद्म सॊग्रह(गद्म सॊकरन) सॊऩादक : जम प्रकाओी, सशभत्र प्रकाओीन, इराहाफाद-1

2. हहद**ो ीी नाकयण यिन**ा : सॊऩादक ग . भ. द**ाब रकय, ड**ॉ. ओ ॐी क काभत, गरुकर प्रतत्फ्ठान, नणे

3. अंशंाथी हहद**ो ीी** व्याकयण : सॊऩादक डॉ. नागप्ऩा, याजनार अॅीॅ ण्ड सन्स, हदली

https://www.youtube.com/watch?v=_g3L-cQVATQ

https://www.youtube.com/watch?v=5u1nVmLUyhE

https://www.youtube.com/watch?v=uFtXojPRF2s

<u>https://hi.wikipedia.org/wiki/ओवधा</u>

SEMESTER – I Ability Enhancement Compulsory Language Courses I Semester -BSc/BCA (AECC: Language-II) Subject : Sanskrit Course Code :126COM01LANAEC05T Title: Sanskrit Poetry, Grammar and Comprehension

Semester	Ability Enhancement compulsory course(L+T)	Marks	Credits	
Ι	I a. Introduction to Classical Sanskrit Poetry b. Selected Portion of a Sanskrit Poetic composition Valmiki Ramayana, Balakanda Sarga-I		3	
	a. Simple Sanskrit Sentence formationb. Swarasandhic. Comprehension in Sanskrit			
	Continuous Evaluation: Attendance, Assignment, Internal Test, Creative Writing, Conversation in Sanskrit	40		
	Total	100	3	

SEMESTER – I Ability Enhancement Compulsory Language Courses I Semester - BSc/BCA Language-II)

Subject: Marathi Course Code : 126COM01LACAEC06T

Syllabus of B.Com. Ability Enhancement Compulsory Course (AECC)

[Title of the Subject/ Disciplin	A . MARATHI								
		The of the Subject/ Disciplin	e: MARATHI								
Year	1	Course Code : AECC-1, L-2 : MARATHI (B	.Com.)	Credits	3						
Sem.	1	Course Title : Discipline : वाङ्म यप्रकार : कथा	+ जाहिरात	Total	64						
		मसुदालेखन (Wangmayaprakar : Katha+Ja	ahiratmasuda	Hours							
		lekhan)									
		Text- सांजवारा' - भीमराव गस्ती, राज्ञी प्रकाश-	1, बेळगाव	1							
		(निवडक कथा - नातं, शाळा, पराजीत, चोरी देवाची, कॉबडा, बेवारस,									
		राजगोळीच्या जमीनदाराला धडा, मस, र	मांजवारा)								
Formativ	e Asses	ssment Marks : 40 Summative Assessment M	arks : 60 Duration of	of ESA: 4 H	Irs.						
		1. To understand the basics of short s	story as a one of popu	lar literar	y						
		form in Marathi literature									
		2. To understand and to get the dos	eternal life of values.								
Learn	ning	To develop the literary taste and al	bility to appreciate lite	rature							
Outco	omes	To develop advertisement writing s	skills in preparing mat	erials for							
		media.									
		5. To understand nature a functions of	of Advertisement writin	ng and to	get						
		the jobs in media.		-	-						
Unit	No.	Course Content/ अभ्यासघटक	Suggested Pedage	ogy H	Hours						
			अध्यापनशास्त	L	J/P/L						
1	1	मराठी कथा : स्वरूप आणि भीमराव गस्ती	1.Lecture Method	12	2						
1	1	'सांजवारा' मधील व्यक्तिरेखा	2. Assignment	13	3						
1	1	' सांजवारा' ची वाङ्मयीन विशेष	5. Individual and group	13	3						
IN	v	जाहिरात : स्वरूप आणि प्रकार	4. Virtual mode	13	3						
\ \	/	जाहिरात मसुदालेखन आणि व्यावसायिक संधी	5.PPT Presentation	13	3						
			6.Class Seminar								
			7.Topic Discussion								
		Recommended Learning Resource	8.Visit to Media/Study i	our							
Print Ros	OUTCOS	1 मराठीतील कथारूपे - रा रा जाधत सेहतर्ध-	उ न प्रकाशन पणे								
	ources	2. कथा : संकल्पना आणि समीक्षा - सधा जोशी.	 मराठारारा प्रयास्ति - रा. ग. जायप, जरुपयन अपगरन, पुज कथा - संकल्पना आणि समीक्षा - सथा जोशी मौज प्रकाशन मंतर्द 								
		 व्यावहारिक मराठी - डॉ. लीला गावीलकर अ 	ाणि डॉ. जयश्री पाटणकर, स्ने	हवर्धन प्रकाश	रान,						
	पुणे										
 उपयोजित मराठी - डॉ. संजय लांडगे, दिलीपराज प्रकाशन, पुणे 											
		 व्यावहारिक मराठी - ल. र. नासिराबादकर, प 	न्डके प्रकाशन, कोल्हापूर								
Digital		http://marathi.pratilipi.com									
Resource	urces http//:mr.vikaspedia.in										
	http://www.maayboli.com										
		http://esahity.com									
		www.bbc.com									
	http://www.goodreads.com										

SEMESTER – I Ability Enhancement Compulsory Language Courses I Semester -

BSc/BCA Language-II) Subject: Urdu Co

Course code : 126COM01LANAE C07T

		Title	f the subject/discip	Ener LIDDI				
		Title o	i the subject/discip	nne: URDU			1	
Year	1	Corse Code: AECC -1 Corse Title: Discipline	Cre	Credit				
Sem.	1	(Drama aur mukhtas Text: Azkar-e-Adab published by Educat	Tot	al urs	64			
Forma	Formative Assessment Marks: 40 Summative Assessment Marks: 60 Duri							
Outcor	mes:	1. Read and learn old 2. Know about famo 3. Read and learn the	d and new Masnvi. us Urdu Novelist and Nov e old poems of Urdu Liter	els. ature.				
Unit	No.	Course Content Suggested Pedagogy					Hours L/P/L	
Unit I Khutoot-e-Galib (Khutoot) Adab aur Tahzeeb (Mazmoon) Jhingar ka Janaza (Inshayiya) Marde Azad (Khaka) Sair Pahale Darwesh ki Kahani (Dasta				 i) Lecture method, ii) Assignments, iii) Individual and Group Presentations and activities iv) Virtual Mode 		12	12	
Unit II Tere Ishq ki Inteha Dil Main Kisi ko rah Kiye Donaun Jahan teri Muhabat Main		v) Po Prese	v) Power Point Presentation 13					
Unit III Shuaye Ummid Muflasi Share say Khitab								
Unit IV	/	Husn Magarcha Hu Dhundenge agar m Banjara Nama	ingama Kamal ulk mulk	gama Kamal k mulk			13	
Unit V		Interview ki Ahmiy Urdu Akhbar main			13			
		R	ecommended Learning Re	esources				
Print Resou	rces	 Azkar-e-Adal Abdurrahim / Ayena-e-Saha 	o, Prof Hussain Basha A M A Mulla Ifat, Dr. Syed Aleemullah	Caladgi, Dr Syee Hussaini, Dr. S	d Aleemulla F	lussain	i, Dr	
Digital Resou	rces	1. http://www.urdubazar.com 2. http://www.rekhta.org 3. http://kitabghar.com						

SEMESTER – I Ability Enhancement Compulsory Language Courses I Semester -

BSc/BCA Language-II) Subject: ARABIC

Course code : 126COM01LANAEC08T

		Title o	f the subject/Disc	cipline: ARAB	IC			
Year	Ι					Credit	30	
Sem.	-	-Corse Code: AECC-1 Corse Title: Disciplind Qadeem, Ashsherr ن بن بدل أ خ۱ر اراخ	Total Hours	64				
Formative Assessment Marks: 40 Summative Assessment Marks: 60 Duration of ES								
Outcomes 1. Brief Knowledge about Arabic Language : 2. Brief Knowledge about Arabic Literature 3. Learn and Grasp the Essence of Arabic poetry, prose, Stories, Short Stories and Novels. 4. Communication in Arabic Language 5. Development of Translation Skills						ries		
Unit N	0.	Course Content Suggested Pedagogy				H U	Hours U/P/L	
l Uni	t	مر ُب ^ن مئ:غ ۱:بي ځ خ دُعخ pشُگ	نب، مُنْ اللهُ اللهُ المَّ المَنْ نبن: ف_ن1	 i) Lecture meth Assignments, if and Group Presentations a iv) Virtual Moo Point 	od, ii) ii) Individual nd activities le v) Power		12	
II Uni	it	غ عنم نا:س: ع	عنْمن ان: فسْ خ	Presentation			30	
III Un	it	َغُڻُا لَا: فَعَ:غَ لَا:ئُد غَ	:، ئې غانىتىنا غ ^ر رغۇ آ لا <i>تى يە</i> ئ				30	
IV Un	it	َدان مە:ٍىل نەمب تە:س قُ) ر لنځی لنی				30	
V Un	it	p ^ن : ى غنع	نغ سن ُع غانين ن ن نلامن ُح				30	
		ڹ	ن:نع بنئ∖ qن: بين ف					
			Recommended Leari	ning Resources	5. 1. 6 . 12	- 11 - 1 1	ć ":	
Print Resour	ces	في 4 مااود ۵ نه څا من(بنځي ځ تېف د 1- مارزتان ي مړېر پيټرا 2- ۲ ټېرېږ ماود ۵ ن في 4يي ر4ري 3- ۱م چړې ماود ۵ من ټرل ناوت تېر ۱ فيا ي څې من فيځې 4- ن لې من ، نړو و دراج ۱ خ چې)ېېن ، س، ۶ ماو لک(منا14 مېدېن۲ 5-						
Digital Resour	ces	1. <u>http://www.a</u> 2. <u>http://naseen</u> 3. http://m.mar	ulmaany.com nalsham.com efa.org					

Skill Enhancement Course-1- Digital Fluency

Name of the Program: Bachelor of Science (B.Sc.)							
Course Credite No. of Hours per Weak Total No. of Teaching Hours							
	redits	$\frac{1+0+2}{1+0+2}$	10tal No. of Teaching Hours				
Pedagoo	v. Classro	oms lecture Case studies Group d	iscussion Seminar &				
field wor	rk etc	mis lecture, cuse studies, Group a	iscussion, Schinder &				
Course (Outcomes:	On successful completion of the cou	rse, the Students will be able to				
1. T	To perform a	nd get knowledge about applications,	virtual learning and internet				
f	undamental	3.					
2. L	Develop holi	stically by learning essential skills suc	ch as effective communication,				
р	problem-solv	ing, design thinking, and teamwork.					
1	Introdu	ction to Computer and Emerging	g Technology: An Overview of				
	Compute	r, Block Diagram of Computer,	Evolution and Generations of				
	Compute	rs, Software and its types, Operating system	ing Systems, types of operating				
	systems,	major functions of the operating syste					
	Introduct IoT, Clo	oud Computing, Machine learning, Big	g Data.				
II	Office A	utomation Tools and Google Apps :					
	Office a	atomation tools: MS-Word, MS-Exce	el and MS-Power point, creating an				
	email-ID	, working with e-mail, addressing with	cc and bcc, Working with Google				
	Apps: G	bogie forms: Creating and analysis of Dees and posting Geogle Shoets. Cre	response, Google Docs – creating				
	uploadin	σ and sharing of files and folders wor	king with Google Meet				
III	E-learni	ng. E-commerce and Security Aspec	rts.				
	E-learni	ng -Introduction to e-learning platform	ns such as Swayam and MOOC. E-				
	Comme	nce: Basic Web Commerce Concept	t, E- payment methods: E-cash				
	Payment	System, Credit Payment System, Typ	bes of Electronic Payment Systems:				
	Credit C	ard • Debit Card • Smart Card • E-N	Money •Electronic Fund Transfer				
	(EFT). C	yber Security: Threats and Preventio	on, Viruses and its types, Antivirus,				
		HITPS, FILEWAII, COOKIES, Hackers a	and Crackers.				
		ratory Activities (Fertorin the tono)	wing assignments):				
	• Identif	ying the configuration and version of a	a computer system (PC),				
	lapto	p, and a mobile phone.					
	• Obs	erving files on OS booting	T 1				
	• Fine	ling the background and foreground p	rocesses on Task manager.				
	Irans	slating Kannada word into English in C	Joogle embedded with Al.				
	Use	Joogle assistant on any android smart	phone to dictate commands				
		1 1: 11					
	• Dov	villoading your e-aadhar.					
	• Cre	ating resume in Word processor.					
	• Creatin	g powerpoint presentation for your co	llege introduction and				
	apply	transitions and animations.					
	• Cre	ate your marksheet in Microsoft Excel	l				
	• Sim	ple computation using spread sheet.					
	• Cre	ate an email-ID and sending and forwa	arding.				
	• Atta	ching files and downloading files in e	email.				
	• Cre	ating a Google form and send it to Ter	n users.				

	 Scheduling a virtual meet and invite peoples to join the Google meet. Creating a botspot from a mobile phone, and allowing others to use
	the hotspot.
	• Sign in and create account e-learning platforms such as Swayam and MOOC.
	• Creating an account in the railway reservation website, IRCTC, and find ingtrains from Belagavi to Bangalore.
	 Demo of online order placing for book using flipkart/ amazon, etc. Install any antivirus app in your mobile and scan. Demonstrate unsecured (HTTP) and secured (HTTPS) websites.
Text Books	
1. Fun	damentals of computers - V. Rajaraman - Prentice- Hall of India.
2. Con	nputer Fundamentals - P. K. Sinha Publisher: BPB Publications.
Reference	e Links:
• Digit	al 101 Course offered by Future Skill Prime Platform
htt	ps://learn.futureskillsprime.in/
• Oper	ating Systems:
http	ps://ftms.edu.my/v2/wpcontent/uploads/2019/02/csca0101_ch06.pdf
• Nine	Dots in Google.com
• Gma	il Creating links:
<u>htt</u>	ps://clubrunner.blob.core.windows.net/0000000961/en-ca/files/homepage/how-
<u>to-</u>	create a-gmail-account/HowtoCreateaGmailAccount.pdf
• Goog	gle Forms: <u>https://pdst.ie/sites/default/files/Google%20Drive_1.pdf</u>
• Google]	Meet: https://edvance.hawaii.hawaii.edu/wp-content/uploads/Google-
Meet 7	Futorial-Getting-Started-and-Recording-a-Lecture.pdf
• Sway	am: <u>https://www.aicte-india.org/bureaus/swayam</u>
• Secu	rity Aspects - <u>https://ncert.nic.in/textbook/pdf/lecs112.pdf</u>
• E-Co	ommence:
http://v	www.aagasc.edu.in/cs/msccs/ECommerce%20Unit%201.pdf • E-
payme	ent methods:
htt	p://www.dspmuranchi.ac.in/pdf/Blog/e%20business%20UnitIII,%20%202020.pdf

Physical Education- Yoga/Health and Wellness (VBC 1 /VBC 2)						
Course Credits 0)2	Total Contact Hours	30			
Internal Assessment Marks : 1	5	Semester End Examination Marks	5:35			
Physical Education- Yoga –Cours	e	126COM01XXXVBC01B				
Cod	e					
Health and Wellness-		126COM01XXXVBC02T				
Course Code						

Common Syllabus for all UG Programmes

Semester-I

Skill Enhancement Courses(VBC-1)

Title of the Course:

Course	Theor	Credi	No. Of	Total No.	Duratio	Internal	Semester	Total
Code	y/	ts	Teaching	Of	n of	Assessme	End	Mark
	Practic		Hours/We	Teachin	Examin	nt Marks	Exam	S
	al		ek	gHours	hrs		Marks	
126COM0 1XXXVB C01B	Physica l Educati onand Yoga	1	2	28	-	2 5	-	25
126COM01 XXXVBC02 T	Health and Wellne ss	1	2	14+14	-	2 5	-	25
	Content of Practical Course	`28Hrs						
---------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------						
Unit1:-Physic	cal Education							
•	General & Specific warm up exercises							
•	Recreation Games and Fitness							
•	Any1Major Game and one minor game (A student canchoose any 1 major game based on the availability of facilities in the college, if not any two minor games.)	28						
Unit2:-Yoga								
•	Shitalikarna Vyayama							
•	Suryanamaskara (Compulsory)							
•	Basic Set of Yoga Asanas							
•	Basic Set of Pranayama & Meditation							

Formative Assessment		
K2Assessment type	Weightage in Marks	
Practicals	Internal Assessment- 25	
Total	25 Marks	

Pedagogy - The course shall be taught through Lecture, Practicals, Interactive, Sessions, Materials, Assignments, Seminars, Intramural & Extramural.

References:

- 1. Russell,R.P.(1994).Health and Fitness Through Physical Education. USA: Human Kinetics.
- 2. Uppal, A.K. (1992). Physical Fitness. New Delhi: Friends Publication.
- 3. Nagendra, H.R. & Nagarathna, R. (2002). Samagra Yoga Chikitse. Bengaluru: SwamiVivekananda Yoga Prakasana.
- 4. Kumar, Ajith. (1984) Yoga Pravesha. Bengaluru: Rashtrothanna Prakashana.
- 5. D.MJyoti,YogaandPhysicalActivities(2015)lulu.com3101,Hillsborough,NC2 7609,UnitedStates

Semester-I

Skill Enhancement Courses (VBC-2)

Title of the Course: Health and Wellness

Conten (1+	nt of Course -0+1)	14+14 Hrs
Unit1:-Introduction		
1. Meaning, Definition and dim	nensions of Health and	
Wellness.		
2. Factors affecting Fitness and	1 Wellness	
3. Role of Fitness in maintaining	ng Health and Wellness	
4. Importance of Health Educa	tion and Wellness	
Unit2:-Methods to Maintain Hea	alth and Wellness	28
1. Role of Physical Activities Health and Wellness	and Recreational Games for	
2. Role of Yoga asanas and M and Wellness	editation in maintaining Health	
3 Nutrition for Health & Well	ness	
Unit3:-Anxiety, Stress and Aging	5	
1. Meaning of Anxiety, Stress	and Aging	
2. Types and Causes of Stress		
3. Stress relief through Exercis	e and Yoga	
Formative A	Assessment	
Assessment type	Weightage in Marks	
Theory and Practical	Internal Assessment	
25 Marks		
Total	25 Marks	

Pedagogy-The course shall be taught through Lecture, Practicals, Interactive, Sessions, Materials, Assignments, Seminars, Intramural & Extramura

References

- i. AAPHERD "Health related Physical Fitness Test Manual."1980Published by Association drive Reston Virginia
- ii. Bucher.C.A (1979) foundation of Physical Education (5thedition MissouriCVM osby Co.)
- iii. Puri.k. Chandra S.S (2005)"Health and Physical Education "New Delhi:Surjeet Publication
- iv. Thomas D Fahey and others. Fit and well:6th Edition New York:Mc GrawHill Publishers, 2005
- v. Dixit Suresh (2006) Swasthya Shiksha sports Publications Delhi.
- vi. Uppal AK & Gautam GP (2008) Health and Physical Education. FriendsPublication New Delhi
- vii. Pinto John and Roshan Kumar (2021) "Introduction to PhysicalEducation", Louis Publication. Mangalor
- viii. Shanti KY(1987)"The Science of Yogic Breathier" (Pranayama) DBBombay
- ix. Ziegler EF (2007) "An Introduction to Sports and Physical Education" Philosophy Delh
- x. Pinto John and Ramachandra K (2021) Kannada Version "DahikaSikshanada Parichaya" Louis publications. Mangalore

SEMESTER – II

Details of AECC Language-IV Offered by Various Stream that the Science Students can opt any one among the following Subjects

Sl. No	Department/ Subject	Category	Course Code	Title
1	Kannada (L3)	ACCE-II	126BSC02LANAEC09T	Kannada
2	Functional Kannada (L3)	ACCE-II	126BSC02LANAEC10T	Functional Kannada
3	English (L4)	AECC-II	126BSC02LANAEC11T	Generic English – II
4	Hindi (L4)	AECC-II	126COM02LANAEC12T	Collection of Short stories and media writing
5	Sanskrit (L4)	AECC-II	126COM02LANAEC13T	Sanskrit Prose Literature, Grammar and Translation
6	Marathi (L4)	AECC-II	126COM02LANAEC14T	Wangmayaprakar : Atmacharitra +Patrakarita
7	Urdu (L4)	AECC-II	126COM02LANAEC15T	Sahafat aur Mukhtasar
8	Arabic (L4)	AECC-II	126COM02LANAEC16T	An Nasrui Jadeed Ashaherul Jadeed

Note : Course Code : 126BSC02LANAEC09T , Course Title : Kannada (L3) for semester II will be updated later.

Details of AEC-1, VBC -3, VBC-4 Subjects studied by Science Students in Semester-I

Sl.No.	Category	Course Code	Title
1	AEC 1	126COM02XXXSEC01T	Digital Fluency
2	VBC 3	126COM02XXXV BC03B	Yoga/ Sports
3	VBC 4	126COM02XXXVBC04B	NCC/NSS/R&R(S&G) / Cultural

Course Code : 126BSC02LANAE C10T

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎ/ಬಿ.ಎಸ್.ಡಬ್ಲೂ/ಸಿ.ಸಿ.ಜೆ (Ability Enhancement Compulsory Course)

Language-1

ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಆಂತರಿಕ ಮತ್ತು ಥಿಯರಿ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಮೊದಲ ವರ್ಷಕ್ಕಾಗಿ ಅಂದರೆ 2021–22ನೇ ಸಾಲಿನ ಮೊದಲ ಮತ್ತು ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್ ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಈ ಮುಂದಿನಂತಿರುತ್ತದೆ.

1. ಆಂತರಿಕ ಅಂಕಗಳ ಮಾದರಿ ಮತ್ತು ನೀಡುವ ವಿಧಾನ : ಸಮಗ್ರ ಮತ್ತು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಮಾದರಿಯನ್ನು ಅನುಸರಿಸಬೇಕಾಗಿರುತ್ತದೆ. ರಚನಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನ (Formative Assessment) ಅಂತಿಮ ಹಂತದಲ್ಲಿ ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನ (Summative Assessment) ಕ್ರಮದಂತೆ ಆಂತರಿಕ ಅಂಕಗಳನ್ನು ನಿರಂತರ ಮೌಲ್ಯಮಾಪನದ ವರದಿ ಮತ್ತು ಸಂಚಿತ ಮೌಲ್ಯಮಾಪನದ ವರದಿಯ ಆಧಾರದ ಮೇಲೆ ನೀಡುವುದು.

- i. ಪತ್ರಿಕೆ ಒಟ್ಟು 100 ಅಂಕಗಳು
- ii. ಘಟಕ 1ರ (Component 1- C1) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಅಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ನ ಮೊದಲೆರಡು ತಿಂಗಳು)
- iii. ಘಟಕ 2ರ (Component 2- C2) ನಿರಂತರ ಮೌಲ್ಯಮಾಪನಕ್ಕೆ 20 ಆಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್ ನ ನಂತರದೆರಡು ತಿಂಗಳು)
- iv. ಸಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಗೆ 60 ಅಂಕಗಳು.

2. Evaluation process of IA marks shall be as follows:

- a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course/s and within 45 working days of semester program.
- b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum / project work etc. This assessment and score process should be based on completion of remaining 50 percent of syllabus of the courses of the semester.
- C) During the 17th 19th week of the semester, a semester end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.
- d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator / Principal. The Program Coordinator / Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher but before commencement of the concerned semester end examinations.
- e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be stamped by the concerned department using their department seal at the time of conducting tests / assignment / worketc.

f) The outline for continuous assessment activities for Component-1 (C1) and Component -2 (C2) of a course shall be as under

Activities	Cl	C2	Total Marks
Session Test	10% marks	10% marks	20%
Seminars/Presentations/Activity	10% marks		10%
Case study /Assignment / Field work / Project work etc.		10% marks	10%
Total	20% marks	20% marks	40%

Conduct of Seminar, Case study / Assignment, etc. can be either in C1 or in C2 component at the convenience of the concerned teacher.

Semester & Course	Course	Course Outcome
1 st Semester Language-1	ಕನ್ನಡ	ಕನ್ನಡೇತರ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಕನ್ನಡ ಜ್ಞಾನವನ್ನು, ಕನ್ನಡ ಭಾಷಿಕ, ವ್ಯವಹಾರಿಕ ಹಾಗೂ ಸಾಂಸ್ಕೃತಿಕ ಜ್ಞಾನವನ್ನು ತುಂಬುವುದು.

	Model Question Paper	
Max Marks: 60 Max		Time: 2 hrs
1. ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ	ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು	ಹೇಳುವುದು. 10x3=30
2. ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ	ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು	ಹೇಳುವುದು. 5X3=15
3. ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ ಅಥವಾ ಕಾವ್ಯದ ಅರ್ಥವ್ಯಾಖ್ಯಾನ.	ಒಟ್ಟು ಏಳು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ (ಲಘು ಪ್ರಶ್ನೆ ಅಥ ಸಾರಾಂಶ) ಐದಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು.	ನವಾ ಟಿಪ್ಪಣಿ ಅಥವಾ ಸಂದರ್ಭದ ಸ್ವಾರಸ್ಯ 3X5=15

ಎಲ್ಲಾ ಸ್ನಾತಕ ಪದವಿಗಳಿಗೆ ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ವಿಷಯ

(Ability Enhancement Compulsory Course)

Language-1

(ವಾರಕ್ಕೆ 4ಗಂಟೆಗಳ ಪಾಠ, 3 ಕ್ರೆಡಿಟ್ ಗಳ ಪತ್ರಿಕೆ, ಒಟ್ಟು ಅಂಕಗಳು-100, ಥಿಯರಿ ಪರೀಕ್ಷೆ ಗೆ-60 ಅಂಕಗಳು. ಆಂತರಿಕ ಗುಣಾಂಕಗಳಿಗೆ-40 ಅಂಕಗಳು, ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯಕ್ಕೆ 2 ಗಂಟೆಗಳ ಪರೀಕ್ಷೆ, ಆಂತರಿಕ ಗುಣಾಂಕಗಳ ಕುರಿತು ನೀಡಿದ ನಿರಂತರ ಮೌಲ್ಯಮಾಪನ ಪದ್ಧತಿಯನ್ನು ಮೇಲೆ ತಿಳಿಸಿರುವಂತೆ ನಡೆಸುವುದು.)

ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್

ಭಾಗ–1

- 1. ವಾಕ್ಯಗಳು
- 2. ವಾಕ್ಯ ಪ್ರಕಾರಗಳು
- 3. ಎರಡು ಸರಳ ಕಥೆಗಳು
- 4. ಎರಡು ಸರಳ ಕವಿತೆಗಳು
- 5. ಎರಡು ಚಲನ ಚಿತ್ರ ಗೀತೆಗಳು
- 6. ಪತ್ರಿಕಾ ಭಂಷಇಯಿಂಂ ಎರಡು ಮಾದರಿಗಳು
- 7. ಸಂಭಂಷಂಣಇಯಂಂ ಮೂರು ವಿಧಾನಗಳು
- 8. ಗಾದೆಯ ಮಾತುಗಳು
- 9. ಕನ್ನಡದ ಪ್ರಾದೇಶಿಕ ಭಂಷಇಗಿಂಳು

ಭಾಗ–2

- 1. ಕನ್ನಡ ಭಾಷೆ
- 2. xox 3
- 3. ಸಾಹಿತ್ಯ
- 4. ಜನಪದ ಸಾಹಿತ್ಯ
- 5. ಜ್ಞಾನಪೀಠ ಮರಸ್ಕೃತ ಕನ್ನಡ ಸಾಹಿತಿಗಳು
- 6. ಕರ್ನಾಟಕದ ವಿಶ್ವಪರಂಪರೆಯ ತಾಣಗಳು
- 7. ಕರ್ನಾಟಕದ ಅದ್ಭುತಗಳು
- 8. ಕರ್ನಾಟಕದ ನದಿಗಳು
- 9. ಕರ್ನಾಟಕದ ಮಹಾನಗರಗಳು

ಸೂಚನೆ : ರಾಣಿ ಚನ್ನಮ್ಮ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆಯ ಅಭ್ಯಾಸ ಮಂಡಳಿಯು ಡಾ. ವಿ. ಎಸ್. ಮಾಳಿ ಹಾಗೂ ಡಾ. ಬಿ. ಎಂ. ಪಾಟೀಲ ಅವರು ಸಿದ್ಧಪಡಿಸಿರುವ E-bookನ್ನು ಇದರೊಟ್ಟಿಗೆ ಲಗತ್ತಿಸಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು E-bookನ್ನು ಅಥವಾ ಸ್ವತಂತ್ರ ಅಧ್ಯಯನ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಪಠ್ಯಬೋಧನೆಯನ್ನು ಮಾಡಲು ಅವಕಾಶ ಕಲ್ಪಿಸಿಕೊಡಲಾಗಿದೆ.

SEMESTER –II

English (L4) syllabus for Bachelor of Science (Basic/Hons) Programme/ Bachelor of Computer Applications (Basic/Hons.) Applications.

Year	2021	Course Code:126BSC02LANAEC11T			Credits	3
Sem.	II	Course Title: Generic English – II			Hours	4
Course	e Pre-re	equisites, if any	NA		I	•
Forma	tive As	sessment Marks: 40	Summative Assessment	Marks: 60		
Cours	se	At the end of the cour	se the student should be able to:			
Outco	mes	1. Acquire the LSRW	(Listening, Speaking, Reading, and Writing) skills.			
		2. Learn to appreciate	literary texts.			
		3. Obtain the knowled	lge of literary devices and genres.			
		4. Acquire the skills of	f creativity to express one's experiences.			
		5. Know how to use c	ligital learning tools.			
		6. Be aware of their s	ocial responsibilities.			
		7. Develop critical the	nking skills.			
		8. Develop gender ser	nsitivity			
		9. Increase reading sp	eed, analytical skills and develop presentation skills.			
		10. Become employa	ble with requisite professional skills, ethics and values			
Unit N	No.		Course Content	Suggested I	Pedagogy	60 Hours
		1 Zero Budget Natura	l Farming by Shibu	Lectures		15 hrs
Unit I		2. Milka Singh: The I	Flying Sikh – Sonia Sanwalka	Tutorials		
	3. On Saying Please - A. G. Gardinar Group Discus				sion	
		1. A Prayer for My Daughter – W. B. YeatsLecture				9 hrs
Unit II		2. Still I Rise - Maya	Angelou	Tutorials		
3. How did you Die?		3. How did you Die?	- Edmund Vance Cooke	Group Discus	sion	
1		1. Reading passage to	give a Title	Lectures		16 hrs
Unit I	II	2. Reading for Vocab	ulary building – synonyms, homonyms,	Tutorials		
		homophones, suffixes	s, prefixes, collocations, often confused words.	Group Discus	sion	

	3. Reading passages on Specific fields for Vocabulary building.	Role				
	4. Barriers for effective listening 1hr Chapter	Play				
	5. Types of Listening					
	6. Techniques to improve listening skills.					
	7. Listening Activities - listening to pre-recorded audios & movies					
	1. Reported Speech	Lectures	20 hrs			
	2. Dialogue writing	Tutorials				
	3.Verbal Communication and Non-verbal communication	Group				
	4. Summarizing	Discussi				
Unit IV	5. Speech Writing	on				
	6. Essay Writing					
	7. Translation Kannada into English and English into Kannada					
	8. Short Paragraphs based on themes with a message on nation, freedom					
	fighters, and achievers. 15 short paragraphs with $5 - 6$ sentences as model					
	paragraphs. (a) Paragraph Translations from Kannada to English (b)					
	Paragraph Translations from English to Kannada					
	Recommended Learning Resources					
Print	1. Vijay F Nagannawar and S. B. Biradar ed. New Horizon, Textbook prescribed for B. A. and BSW					
Resources	Programme under CBCS, Rani Channamma University, Belagavi, 2021.					
	2. Vijay F Nagannawar and S. B. Biradar ed English Stars, Textbook prescribed	for BCom and BBA				
	Programme under CBCS, Rani Channamma University, Belagavi, 2021.					
	3. Dr. S. B. Biradar and Prof. Vijay F Nagannawar ed. English Gems, Textbook	prescribed for B. Sc. and BC	CA			
	Programme under CBCS, Rani Channamma University, Belagavi, 2021.					
	4. Quirk Randolph, Sidney Greenbaum, Geoffrey Leech & Jan Svartvik. A Comp	orehensive Grammar of the				
	English Language General Grammar. Longman.					
	5. Herring, Peter. Complete English Grammar Rules. Create space Independent I	Pub, California, 2016.				
	6. Jain Charul, Pradyumnasinh Raj & Yunus Karbharj. English Skills for Acader	nic Purposes. Macmillan				
	Education. London, 2017					
	7. Geoffrey Leech and Svartik. Communicative Grammar of English, Pearson					
	8. Geoffrey Leech. English Grammar for Today, Palgrave					
	9. Prasad P.The Functional Aspects of Communicative Skills.					

http://orelt.col.org/module/unit/4-grammar-improving-composition-skills
https://www.academia.edu/26724441/A_Concise_Grammar_for_English_Language_Teachers.
https://www.efluniversity.ac.in/EnglishPro.php
https://www.britishcouncil.in/

Question Paper Pattern

Total		60
V.	04 Language Activity out of 6: from Unit IV	04x05=20
IV.	02 questions out of 4: from Unit III	02x05=10
III.	01 essay type question out of 2 from Unit II	01x10=10
II.	1 essay type question out of 2 from Unit I	01x10=10
I.	10 objective questions 5 from Unit I and 5 from Unit II	10x01=10

SEMESTER –II Ability Enhancement Compulsory Language Courses (L 4) for -BSc/BCA Subject : Hindi Course code : 126COM02LANAEC12T

Hindi Syllabus of B.Com. Ability Enhancement compulsory Course AECC

Title	e o	f the Subject/Discipline : A2 साहित्यिक विधा : कहानी	संकलन+मीडिया लेख	बन
Year	1	Course Code : AECC-2-HINDI (B.Com.)	Credits	3
Sem.	2	Course Title/Discipline :	Hours	4
		Collection of Short stories+Media writing		
		Text : कथा दर्पण (कहानी संकलन)		
		लोकभारती प्रकाशन, प्रयागराज-211001		
Formative	Ass	essment Marks :30 Summative Assessment Marks :70 D	ouration of ESA :64	hrs.
Learning	1.	कहानी के पठन पाठन में रुचि उत्पन्न होगी।		
Outcomes	2.	आधुनिक हिंदी कहानी के विकास क्रम से परिचित होंगे।		
	3.	भाषाँची शुद्धता के प्रति रुचि निर्माण होगी।		
4. लेखन कौँशल प्राप्त कर सकेंगे।				
	5.	पत्रकारिता के बारे में जान सकेंगे।		
Unit No.	Course Content		Suggested Pedagogy	Hours L/P/L
Unit I	क	था दर्पण (कहानी संकलन) की कहानियाँ क्र.1,2,3	1. कक्षा व्याख्यान	16
Unit II	क	था दर्पण (कहानी संकलन) की कहानियाँ क्र.4,5,6	2. सवाद एव बहस 3. सामूहिक चर्चा	16
Unit III	क	था दर्पण (कहानी संकलन) की कहानियाँ क्र.7,8	4.रचनात्मक अभिव्यक्ति	16
Unit IV	सन	नाचार संकलन और लेखन	7	16
		Recommended Leaning Resources		
Print Resources	1.1	कथा दर्पण (कहानी संकलन) लोकभारती प्रकाशन, प्रयागराज-211001		
	3	19ट मिडिया : रुपचल्द गोलम, भा मटराज प्रकाशन, १६ल्ला-११७७५५ प्रकारिता की निभिन्न निष्णार्गे : वॉ. निश्रांत प्रिंड गणा प्रत्निकेशन्त्र, नई जिन्त्री-११	0002	
	4.	पत्रकारी लेखन के आयाम : मनोहर प्रभाकर, पंचशील प्रकाशन, जयपुर	0002	
Digital Resources	htt	ps://hi.wikipedia.org/wiki/हिन्दी_कहानी		

SEMESTER –II Ability Enhancement Compulsory Language Courses (L 4) for -BSc/BCA

Subject : SANSKRIT Course code : 126COM02LANAEC13T Title: Sanskrit Prose Literature, Grammar and Translation

Semester	Ability Enhancement compulsory course(L+T)	Marks	Credits
Π	 a. Introduction to Samskruta Gadya Kavya b. Selected Portion of a Sanskrit Prose composition Vethala Panchavimshathi (Selected stories) 	45	3
	a. Correction of errors b. Tiganta Prakaranam – Lat Lakara, Lang Lakara, Lot Lakara, Vidhiling Lakara, Lrut Lakara. c. Translation from Sanskrit to Kannada / English	15	
	Continuous Evaluation: Attendance, Assignment, Internal Test, Creative Writing, Conversation in Sanskrit	40	
	Total	100	3

Books for study & Reference:

- 1. Vethala Panchavimshathi: Published by Chowkamba Vidyabhavan.
- 2. History of Sanskrit Literature by M.R. Kale.
- 3. Samkruta Sahityada Itihasa (Kannada) S.Ramachandra Shastri-Prasaranga, Bangalore University Publications.
- 4. Bhasha Shastra Mattu Samskruta Sahitya Charitre (kannada) edited by Dr.K. Krishnamurthy, Vidwan Ranganatha Sharma and vidwan H.K. Siddagangaiah.
- 5. History of Sanskrit Literature- S.Rangachar
- 6. History of Classical Sanskrit Literature- M. Krishnamachariyar
- 7. Samskruta Sahitya Sameekshe (Kannada) Dr. M. Shivakumara Swamy
- 8. Higher Sanskrit Grammar- M.R. Kale.

SEMESTER –II Ability Enhancement Compulsory Language Courses (L 4) for -BSc/BCA

Subject : Marathi Course code : 126COM02LANAEC14T Course Title : Wangmayaprakar : Atmacharitra +Patrakarita

		Title of the Subject/ Discip	line : MARATHI		
Year	1	Course Code : AECC-2,L-2 : MARATH	Credits	; 3	
Sem	н	Title : Discipline : वाङ्मयप्रकार : आत्मच (Wangmayaprakar : Atmacharitra + Text - 'मी वनवासी' - सिंधुताई सपकाळ, रिया पब्लिकेशन्स, कोल	Total Hours	64	
Format	ive Ass	essment Marks : 40 Summative Assessme	ent Marks : 60 Dura	tion of E	SA: 4 Hrs.
Learr Outco	ning omes	 To understand the development To understand the way of struct To understand an account of a To learn from this autobiograp peoples To understand the life experient To provides opportunity for see 	t of personalities turing personality life and achievemer only how to work for ces and goals of the eing patterns in one	nts r downtr e author 's life	oden
Unit	No.	Course Content/ अभ्यासघटक	Suggested Pedagogy अध्यापनशास्त		Hours L/P/L
1	I.	मराठीतील आत्मचरित्रे : स्वरूप व वाटचाल	1.Lecture Method		12
	1	'मी वनवासी' मधील जीवन संघर्ष 2. Assignment 'मी वनवासी' ची वाङ्मयीन वैशिष्ट्ये 3. Individual and grophy मराठी भाषा आणि पत्रकारिता 4. Virtual mode		1.	13
H	II			up	13
IN	V				13
v		बातमीलेखनाचे स्वरूप आणि व्यावसायिक संधी	5.PPT Presentation 6.Class Seminar 7.Topic Discussion 8.Visit to orphanage age home- Study To	& old	13
		Recommended Learning Res	ources		
Print Resour	ces	 चरित्र - आत्मचरित्र - अ. म. जोशी, स्नेहव मराठीतील आत्मचरित्रात्मक लेखन - उष अविस्मरणीय चरित्रे - आत्मचरित्रे - नाराय वृत्तपत्र विद्या - प्रसन्नकुमार आकलूजकर, उपयोजित मराठी - डॉ. संजय लांडगे, दि 	धेन प्रकाशन, पुणे । हस्तक, स्नेहवर्धन प्रकाश गण भोसले, अथर्व प्रकाशन श्रीविद्या प्रकाशन, पुणे लीपराज प्रकाशन, पुणे	ान, पुणे न, जळगाव	ſ
Digital Resources http://vishwakosh.marathi.gov.in http://marathivishwakosh.org http://marathi.pratilipi.com http://imr.vikaspedia.in http://www.maayboli.com http://esahity.com www.bbc.com					

SEMESTER -II Ability Enhancement Compulsory Language Courses (L 4) for -BSc/BCA Subject :Urdu

Course code : 126COM02LANAEC15T Course Title : Sahafat aur Mukhtasar

	(AECC)					
	Title of the subject/discipline:	URD	U			
Year	Corse Code: AECC -2, L-2-Urdu (B.Com)			Credit		03
Sem.	II Corse Title: Discipline: اسحافت اور مختصر کپائیل) kahaniyan) Text: Ayena-e-Sahafat - Dr S M Khatib published by Educatioal Book House Aligarh	l rs	64			
Formativ	ve Assessment Marks: 40 Summative Assessment Marks	5:60	Duration	ofESA	: 4 Hrs	5.
Outcom	es: 1. Brief Knowledge about Urdu Language 2. Brief Knowledge about Urdu Literature 3. Development of Urdu Reading & Writing Skills					
Unit N	o. Course Content		Suggested		d Hour	
Unit I	Samaji Media Hum Huye Tum Huye Meer Huye (Darama) Mirza Ghalib Ki Seerat Budhi Kaki (Afsana) Hindustani Adab main Hali ka darja (Mazmoon)	i) L ii) A iii) I Gro and iv) Y	i) Lecture method, 12 ii) Assignments, iii) Individual and Group Presentations and activities iv) Virtual Mode		12	
Unit II	Sar main Souda bhi Nahin Mujhe Chhedane ko Saqi Dayar-e-Noor Main Tera Shaku	v) P Pres	v) Power Point 13 Presentation		13	
Unit III	Aye Sharif Insanu Samp Dahli Marhoom Raste Ki Mantaque				13	
Unit IV	V Dil Jal Raha Tha Gam say Patta Patta Buta Buta Tahzeeb ka Urooj		13			
Unit V	Internet aur Urdu Online Media ka Tassawar aur Urdu				13	
	Recommended Learning Resource	es		64		
Print Resource	Azkar-e-Adab, Prof Hussain Basha A Kaladg Abdurrahim A Mulla Ayena-e-Sahafat, Dr. Aleemullah Hussaini, D	i, Dr Sy	ed Aleemu Khatib	illa Hu	issaini	, Dr
Digital Resource	http://www.urdubazar.com http://www.rekhta.org http://kitabshar.com					

SEMESTER -II Ability Enhancement Compulsory Language Courses (L 4) for -BSc/BCA

Subject : Arabic Course code : 126COM02LANAEC16T Course Title : An Nasrui Jadeed Ashaherul Jadeed

			~1				
	1.	Title of the subject/Discipline: ARABIC				414	
Year	1				Cre	dit	03
Sem.	"	Corse Code: AECC-2- ARABIC (B.Com) Total Corse Title: Discipline: النثر الجديد، الشعر الجديد (An Nasrul Jadeed, Hours Ashsherul Jadeed) Text: نفحة الأدب لوحيد الزمان كيراتوي، ندوة العلماء، لكنو					
Forma	ative A	Assessment Marks: 40 Summative Assess	ment Mar	ks: 60	Duration of	of ESA	: 4 Hrs
Learni Outco	ing omes	 Brief Knowledge about Arabic Language Get knowledge about History of Arabic Linguage Get knowledge about History of Arabic Linguage Development of Arabic Reading & Writh A. Communication in Arabic Language Development of Translation Skills 	ge terature, its iting Skills	i meanin	gs and impo	rtance	e of the
Unit	No.	Course Content		Su	Suggested		Hours U/P/L
Unit I		i) Lecture meth جزاء سيئة مثلها، العابد و الكلب الناصح، الأسد		ure method	. 13	2	
Unit II Unit III		لصديق المخلص، الأخلاق المذمومة، العاملة	و الشعلب، ال الأمينة	ii) Assignments, iii) Presentations and activities iv) Virtual Mode v) Power Point Presentation 13			
		برات، سورة الجمعة	سورة الحج			3	
		فة، الضاحية، التحية المكتبة، الأستاذ والوالد،	نشيد الكشار النجم، القمر			3	
Unit I	v	الله (الفصل الثالث والرابع)	العصر الج	1		13	3
Unit V	/	تأنيث، التركيب التوصيفي، وحدة وجمع، لية	التذكير والن الجملة الفعا	1			3
		Recommended Learn	ing Resour	ces			
Print Resou	urces	0	یات ومصطفی آمی	ي . حمن الز بي الجارم	الزمان كيراتو يدان بدران ي للأستاذ أحمد جزء الأول) لعا	، لوحيد لأدب لز يم ب العرب نسح (ال	 1- نفحة الأدب 2- مختارات ال 3- القرآن الكر 4- تاريخ الأدم 5- التحو الواه
Digita Resou	l irces	http://www.almaany.com http://naseemalsham.com http://m.marefa.org	http://www.almaany.com http://naseemalsham.com http://m.marefa.org				

Syllabus of B.Com. Ability	Enhancement	Compulsory	Course
	(AECC)		

SEMESTER –II Ability Enhancement Compulsory Courses for -BSc/BCA

Course code : 126COM02XXXAEC01T Course Title : ENVIRONMENT STUDIES

	Соц	Name of the Program: Bachelor of Com	merce (B.Sc) of the Course: 2. ENVIRONMENTAL STUDIES	
Course Cr	edits	No. of Hours per Week	Total No. of Teaching Hours + Field work	
2 Credi	ts	2+0+0	45 Hrs	
Pedagogy	: Clas	ssrooms lecture, Case studies, Group discussi	on, Seminar & field work etc.,	
Module		Syl	labus	Teaching Hours
Ι	Int and eco and Nat Lar Def and Wa (Int	roduction to Environmental Studies: Multid importance; Concept of sustainability and forest ecosystem attice and function of ecosystem b) Grassland ecosystem c) Desert ecosystem attice cosystems (ponds, streams, lakes, rivers, tural Resources: Renewable and Non-Renew and resources and land-use change; Land degrad forestation: Causes and impacts due to mining, tribal populations.	isciplinary nature of environmental studies. Scope ustainable development. Ecosystems: What is an nergy flow in an ecosystem: food chains, food webs owing ecosystems: oceans, estuaries) rable Resources ation, soil erosion and desertification. dam building on environment, forests, biodiversity round water, floods, droughts, conflicts over water	15
	En gro	ergy resources: Renewable and non-renewabl wing energy needs, case studies.	e energy sources, use of alternate energy sources,	
II	Bio div	diversity and Conservation: Levels of biol ersity; Biogeography zones of India; Biodiversi	ogical diversity: Genetic, species and ecosystem ity patterns and global biodiversity hotspots.	12
	Ind	ia as a mega-biodiversity nation; Endangered a	nd endemic species of India.	

	 Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. Environmental Pollution: Types, causes, effects and controls; Air, water, soil and noise pollution. Nuclear hazards and human health risks. Solid waste management, Control measures of urban and industrial waste. 	
III	 Fondition case studies. Environmental Policies and Practices: Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife (Protection) Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD). Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context. Human Communities and the Environment Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies. Disaster management: Floods, Earthquake, Cyclones and Landslides. Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi). Field work (5 hours) 	18

Reference

Bharucha, E. (2015). Textbook of Environmental Studies.

Carson, R. (2002). Silent Spring. Houghton Mifflin Harcourt.

Climate Change: Science and Politics. (2021). *Centre Science and Environment*, New Delhi. Gadgil, M., & Guha, R. (1993). *This Fissured Land: An Ecological History of India*. Univ. of California Press.

Gleeson, B. and Low, N. (eds.) (1999). Global Ethics and Environment, London, Routledge.

Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. (2006). *Principles of Conservation Biology*. Sunderland: Sinauer Associates.

Nandini, N., Sunitha N., & Sucharita Tandon. (2019). A text book on Environmental Studies (AECC). Sapna Book House, Bengaluru.

Odum, E.P., Odum, H.T. & Andrews, J. (1971). Fundamentals of Ecology. Philadelphia: Saunders.

Pepper, I.L, Gerba, C.P. & Brusseau, M.L. (2011). Environmental and Pollution Science. Academic Press.

Rajit Sengupta and Kiran Pandey. (2021). State of India's Environment 2021: In Figures. Centre Science and Environment.

Singh, J.S., Singh, S.P. and Gupta, S.R. (2014). *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.

Sodhi, N.S., Gibson, L. & Raven, P.H. (Eds). (2013). Conservation Biology: Voices from the Tropics. John Wiley & Sons.

Wilson, E. O. (2006). The Creation: An appeal to save life on Earth. New York: Norton.

World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press.

SEMESTER –II : Value Based Course -3 for -BSc/BCA Course code : 126COM02XXXVBC03B Course Title : PHYSICAL EDUCATION & SPORTS

Semester-II

Skill Enhancement Courses (SEC-I1)

Title of the Course:

PHYSICAL EDUCATION & SPORTS

Course Code		Credits	No. Of	Total No.	Durat	Internal	Semest	Total
	Practical		Teaching Hours/Week	Of Teaching Hours	ion of Exam in hrs	Assessment Marks	erEnd Exam Marks	Marks
126COM02XXXV BC03B	Physical Educationand Sports	1	2	28	-	25	-	25
Total		1	2	28	-	25	-	25

Content of Practical Course			
	1		
Unit1:-Physical Education & Sports			
• Conditioning exercises			
• Aerobics & Calisthenics			
• One Major Game and One Indigenous Game(Basic Skills)	28		
• One Track/Field Event			
Intramural Competitions			

Formative Assessment					
Assessment type	Weightage in Marks				
Practicals	Internal AssessmentMarks-25				
Total	25 Marks				

Pedagogy: The course shall be taught through Lecture, Practicals, Interactive, Sessions, Materials, Assignments, Seminars, Intramural & Extramural.

References: 1. Muller, J.P. (2000). Health, Exercise and Fitness. Delhi: Sports.

2. IAAF Manual

3. Vanaik.A(2005)Play Field Manual, Friends Publication New Delhi

4. M.J Vishwanath, (2002) Track and Field Marking and AthleticsOfficiating Manual ,Silver Star Publication, Shimoga

5. Steve Oldenburg (2015) Complete Conditioning for Volleyball, Human Kinestics.

Note: Skills of Sports and Games (Game Specific books) may be referred