BAGALKOTUNIVERSITY

MudholRoad,Jamkhandi-587301Dist:Bagalkot

TheDraft

PROGRAM/COURSESTRUCTUREANDSYLLABUS
Asper
the Choice Based Credit System (CBCS) designed in accordancewithLearning Outcomes-BasedCurriculum Framework (LOCF) of National Education Policy

(NEP)2020

for

BachelorofScience/Bachelorof Science (Hons)

AsperNEP2020andadaptedfromRCUBelagavi applicable from the Academic Year 2023-24

PreambleforUGSyllabusofBagalkot 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 universityas per the Karnataka State Universities Act 2000, as modified by the 26th Act of 2022. Thestudents taking admission to any of the colleges in the districtof Bagalkote, from the academic year 2023-24 will be students of Bagalkot University. The Chancellor of the university, thehonorable Governor of Karnataka, has instructed the Vice chancellor and the universityto 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).

Inthisconnection,BagalkotUniversityhasadaptedtheundergraduatesyllabusfromRCU,Belagaviforall the3/4 year degree programmes such as BA, BSC, BCOM, BCA, BSW etc. The syllabus follows theNEP2020 format and the first year syllabus is beingpublished. 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/ questionpaper codes are changed.The subject code format isdescribed in the following.

SubjectCodeFormat

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ver	Uni.Code		DEGREE			SEM		DISCIPLINE			SUB. TYPE			SL.NO.IN DISC.&S. TYPE		TH/ LAB /B/I NT.
1	2	6	B	S	C	0	1	P	H	Y	D	S	C	0	1	T
1	2	6	B	A	B	0	1	H	I	S	D	S	C	0	1	T

[1]The Ver informationgives the versionof the syllabus. It can take values1,2..9,a,b,…

[2-3] The University UUCMS Code

[4-6]TheUGdegreecodestobeprovidedas

Sl.No	Degree Code	Degree
1	BSC	BachelorofScience
2	BAB	BachelorofArts
3	BCM	BachelorofCommerce
4	BBA	BachelorofBusinessAdministration
5	BCA	Bachelorof ComputerApplications
6	BSW	BachelorofSocialWork

[7-8]TheSemesterInformationisprovidedas

Sl.No	Semester
1	‘01
2	’02
3	03
….	

[9-11]TheDisciplineInformationtobeprovided as

SlNo	Degree	DisciplineCode
1	BCM-BCOM	XXX
2	BCA	XXX
3	BBA	XXX
4	BSW	XXX
5	BA	‘HIS’,GEO’,’KAN’,‘HIN’etc.Thedetailedlististobeprovided
6	BSC	‘PHY’,’CHE’,‘BOT’,’ELN’etc.The detailedLististobeProvided

[12-14]TheSubjectTypetobeprovidedas

Sl.No.	TYPE	Description
1	DSC	DisciplineSpecificCore
2	DSE	DisciplineSpecificElective
3	OEC	OpenElectiveCourse
4	AEC	AbilityEnhancementCourse
5		

[15-16]The Running SerialNumberistobeprovided for a particulardiscipline and subject type01 to 99

[17]Thischaracterspecifiesthecategoryofthesubjectnamely,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

IntroductiontoBSc/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 basedcurriculum framework (LOCF) will provide students with a clear purpose to focus theirlearning efforts and enable them to make a well judged choice regarding the course they wishto study. This will suit the present day needs of students in terms of securing their pathstowards higher studies or employment.

ProgrammeStructure

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 theoryand 2 credits for practical).

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

Seventh and eighth semesters will have three Discipline Specific Core (DSC) courses in eachsemester, three DSC courses have 6 credits each (4 credits fortheoryand 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.

VocationalCourses: Fifthandsixthsemesterwillhaveoneeachvocationalcoursesofeach 3 credits. In sixth semester students have 2 credits internship course (usually on researchrelated 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 basicresearch insights knowledge alongwith 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 subjecttomeettheequivalenceoffirst year masterdegree(4credits). Ineighthsemester againoneDSE 4creditstheoryandanother researchprojectfor4creditsneedtoperformonesemester projectwork byselecting suitable problems bythe mentors.

ProgrammeOutcomesofBSc/B.Sc.(Hons)

The BSc/B.Sc. (Hons) programme is designed to develop in depth knowledge in students, ofthe core concepts and principles that are central to the understanding of this core science discipline. Undergraduates pursuing this programme of study go through laboratorywork 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:Widthanddepth:**
  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 ofthis programmeisthelaboratory skills thatstudentsdevelopduring 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 laboratoryinstruments 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 enhancestudents'abilitytowritemethodical,logical andprecisereportsareinherent tothe

structureoftheprogramme.Techniquesthateffectivelycommunicatescientificcontent tolarge audiences areacquired through oral and poster presentations and regularlaboratory report writing.

- **Capacity Enhancement:**

  Moderndayscientific environmentrequiresstudentstopossess abilitytothink independentlyas well as be able to work productivelyin 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 studentdevelopment through effective teaching learning process.

- **PortableSkills:**

Besidescommunicationskills, theprogrammedevelops arangeofportable ortransferableskills 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. Theseare valued across work environments.

ProgramSpecificOutcomes

- 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 technologyfor sustainable future and solve the emerging opportunities andchallenges.
- Students are motivated to understand theoretical and practical applications in which traditional and modern apparatus are used.
- Awarenesswillbecreatedto understandthevariouscriticalperspectivesandenvironmental challenges in science.

Structure oftheProgrammeinB.Sc./B.Sc(Hons.)

The programme includes Core Courses and Elective Courses. The Core Courses are all compulsorycourses (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 compulsoryAbilityEnhancement Courses (AECC). The Core, DSE and GE Courses are six credit courses; the SEC, AEC are four credit courses.

B.Sc.Programmestructurehaving practicalcore courses

(Onemajorandotherminor,bothare practicalcorecourses)

	DisciplineSpecificCore Courses(DSCC)			ElectiveCourses			AbilityEnhancement Course									TotalCredits
				DisciplineSpecific Elective(DSE) / OpenElective Course(OEC)			SkillEnhancementCourse						AbilityEnhancementCompulsoryCourse(AECC)			
							SkillBased			ValueBased						
	Core Course	L+T+P	Credit	Course	L+T+P	Credit	Course	L+T+P	Credit	Course	L+T+P	Credit	Course	InstructionHrs	Credit	
I	DSCC-A1	4+0+4	4+2=6	OEC-1	3+0+0	3+0=3	SEC-1	1+0+2	1+1=2	HealthandWellness + Yoga	0+0+2+0+0+2	0+1=1+0+1=1	Kannada-1	4	3+0=3	25
	DSCC-B1	4+0+4	4+2=6										MIL/MEL-1	4	3+0=3	
II	DSCC-A2	4+0+4	4+2=6	OEC-2	3+0+0	3+0=3				NCC/NSS/R &R(S&G)/ Cultural+ Yoga	0+0+2+0+0+2	0+1=1+0+1=1	Kannada-2	4	3+0=3	25
	DSCC-B2	4+0+4	4+2=6										MIL/MEL-2	4	3+0=3	
													Environmental study	2	2+0=2	
	ExitoptionwithCertificate(50credits)															

Note:

- Incase ofB.Sc. Oncea candidate chose two courses/subjectsof a particular twodepartment inthe beginning,he/sheshall continue the same till the end of the degree, then there is noprovision to change the course(s) and Department(s).
- AcandidateshallchooseoneoftheDepartment's courses asmajor and otherDepartment courseas minorinfifth andsixthsemester andmajor coursewill get continued in higher semester.
- OEC:StudentsshouldoptOECfromdepartmentsotherthanmajorandminordisciplines.

Note,AbbreviationExplanationandCoding:

ConceptNote:

1. **CBCS**isamodeoflearninginhigher educationwhichfacilitatesastudentto have some freedom in selecting his/her own choices, across various disciplines for completing a UG/PG program.
2. Acreditisaunitofstudyofafixedduration. Forthepurposeofcomputation of workload as per UGC norms the following is mechanism be adopted in the University:

   Onecredit(01)=OneTheoryLecture (L)periodof one(1)hour. One credit (01) = One Tutorial (T) period of one (1) hour. One credit (01)=Onepractical(P)periodoftwo(2)hours.
3. Course:paper/subjectassociatedwithAECC,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 sametilltheendofthedegree/Hons,thenthereisnoprovisiontochange thecourse(s) andDepartment(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 coursewill get continued in highersemester.**
6. Whereverthereisapracticaltherewillbenotutorialandvice-versa
7. Amajorsubjectisthesubjectthat'sthemainfocusofCoredegree/concerned.
8. Aminorisasecondarychoiceofsubject thatcomplementscoremajor/concerned.
9. Vocational course is a course that enables individual to acquire skills set that arerequired for a particular job.
10. Internship is a designated activity that carries some credits involving more than **25 days** of workingin an organization (eitherin same organization or outside) under the guidance of an identified mentor. Internship shall be an integral part of the curriculum.
11. **OEC:Should beotherthan DSCandDSECsubjects. Forexample Chemistry students haveto opt for OEC fromdepartments other than major and minor disciplines.**

AbbreviationExplanations:

1. AECC:AbilityEnhancementCompulsoryCourse.
2. DSC:DisciplineSpecificCoreCourse.
3. DSEC:DisciplineSpecificElectiveCourse.
4. SEC:SkillEnhancementCourse.
5. VBC:ValueBasedCourse.
6. OEC:Open/GenericElectiveCourse
7. VC:VocationalCourse.
8. IC:InternshipCourse
9. L1:LanguageOne

10. L2: MIL
11. L3:Languagethree
12. L4:MIL
13. L=Lab;T=Theory;P=Project.
14. MIL=ModernIndianLanguage;EnglishorHindiorTeluguorSanskritorUrdu

CreditsStructureofB.Sc.ISemester

SEMESTER-I										
Category	Course code	Titleof thePaper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
L1	126BSC01LANAEC01T	Kannada	40	60	100	4	-	-	3	2
	126BSC01LANAEC02T	Functional Kannada								
L2	126BSC01LANAEC03T	English	0	60	100	4	-	-	3	2
	126COM01LANAEC03T	Hindi								
	126COM01LANAEC04T	Sanskrit								
	126COM01LACAEC05T	Marathi								
	126COM01LANAEC06T	Urdu								
	126COM01LANAEC07T	Arabic								
DSC1	126BSC01XXXDSC01T	XXX	40	60	100	4	-	-	4	2
	126BSC01XXXDSC02L	XXX	25	25	50	-	-	4	2	4
DSC1	126BSC01XXXDSC01T	XXX XXX	40	60	100	4		-	4	2
	126BSC01XXXDSC02L		25	25	50	-	-	4	2	4
SEC1	126COM01XXXSEC01T	Digital Fluency	25	25	50	1	-	2	2	2
VBC1	126COM01XXXVBC01B	Yoga/ Sports	25	--	25	-	-	2	1	--
VBC2	126COM01XXXVBC02T	Health& Wellness	25	--	25	-	-	2	1	--
OEC1	126BSC01XXXOEC01T	XXX	40	60	100	3		-	3	2
TotalMarks					700	Semester Credits			25	

*XXX represents Discipline, *COMCommonforallUGcourses*LAN Languages

Note: Students can select either Digital Fluency or Environmental Studies : 126COM01XXX AEC01T

CreditsStructureofB.Sc.II Semester

SEMESTER-II										
Category	Course code	Titleof thePaper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
L3	126BSC02LANAEC09T	Kannada	40	60	100	4	-	-	3	2
	126BSC02LANAEC10T	Functional Kannada								
L4	126BSC02LANAEC11T	English	0	60	100	4	-	-	3	2
	126COM02LANAEC012T	Hindi								
	126COM02LANAEC13T	Sanskrit								
	126COM02LANAEC14T	Marathi								
	126COM02LANAEC15T	Urdu								
	126COM02LANAEC16T	Arabic								
DSC2	126BSC02XXXDSC02T	XXX	40	60	100	4	-	-	4	2
	126BSC02XXXDSC02L	XXX	25	25	50	-	-	4	2	4
DSC2	126BSC02XXXDSC 02T	XXX	40	60	100	4		-	4	2
	126BSC02XXXDSC02L	XXX	25	25	50	-	-	4	2	4
AEC1	126COM01XXXAEC01T	Environmental Studies	25	25	50	1	-	2	2	2
VBC3	126COM02XXXVBC03B	Physical Education&Sports	25	--	25	-	-	2	1	--
VBC4	126COM02XXXVBC04T	NCC/NSS/R&R(S&G) / Cultural	25	--	25	-	-	2	1	--
OEC2	126BSC02XXXOEC01T	XXX	40	60	100	3		-	3	2
		TotalMarks			700	Semester Credits			25	

*XXXrepresentsDiscipline,*COMCommonforallUGcourses,*LAN Languages

Note: Students can select either Digital Fluency or Environmental Studies : 126COM01XXX AEC01T

Bagalkot University, Jamkhandi

DisciplineSpecificCoreSubjectcodesofSciencestreamforfirstandsecondsemester

Sl. No	Subject	Category	Semester	Coursecode	Title
1	Chemistry	DSC1	I	**126BSC01CHEDSC91T**	Chemistry-1
		DSC1	I	**126BSC01CHEDSC01L**	ChemistryLab-1
		DSC2	II	**126BSC02CHEDSC02T**	Chemistry-2
		DSC2	II	**126BSC02CHEDSC02L**	ChemistryLab-2
2.	Physics	DSC1	I	**126BSC01PHYDSC91T**	Mechanics&Properties ofMatter
		DSC1	I	**126BSC01PHYDSC01L**	PracticalI
		DSC2	II	**126BSC02PHYDSC02T**	ElectricityandMagnetism
		DSC2	II	**126BSC02PHYDSC02L**	Practical II
3	Mathematics	DSC1	I	**126BSC01MATDSC91T**	Algebra-IandCalculus –I
		DSC1	I	**126BSC01MATDSC01L**	TheorybasedPractical's on Algebra -I andCalculus – I
		DSC2	II	**126BSC02MATDSC02T**	Algebra - II andCalculus-II

		DSC2	II	**126BSC02MATDSC02L**	TheorybasedPractical's on Algebra- II and Calculus – II
4	Botany	DSC1	I	**126BSC01BOTDSC91T**	MicrobialDiversityand technology
		DSC1	I	**126BSC01BOTDSC01L**	MicrobialDiversityand technology
		DSC2	II	**126BSC02BOTDSC02T**	DiversityofNonflowering plants
		DSC2	II	**126BSC02BOTDSC02L**	DiversityofNonflowering plants
5	Zoology	DSC1	I	**126BSC01ZOODSC91T**	Cytology,Genetics and Infectious Diseases
		DSC1	I	**126BSC02ZOODSC01L**	CellBiologyand Genetics
		DSC2	II	**126BSC02ZOODSC02T**	Biochemistryand Physiology
		DSC2	II	**126BSC02ZOODSC02L**	Physiological, Biochemical& Hematology
6	Electronics	DSC1	I	**126BSC01ELEDSC91T**	Electronic Devices and Circuits.
		DSC1	I	**126BSC01ELEDSC01L**	PracticalI
		DSC2	II	**126BSC02ELEDSC02T**	Analog and Digital Electronics
		DSC2	II	**126BSC02ELEDSC02L**	PracticalII
7	Statistics	DSC1	I	**126BSC01STSDSC91T**	**Descriptive Statistics**
		DSC1	I	**126BSC01STSDSC01L**	**PracticalCourseI**
		DSC2	II	**126BSC02STSDSC02T**	ProbabilityandDistributions

		DSC2	II	**126BSC02STSDSC02L**	Practical Course II
8	Biotechnology	DSC1	I	**126BSC01BITDSC91T**	Cell Biology and Genetics
		DSC1	I	**126BSC01BITDSC01L**	Cell Biology and Genetics lab
		DSC2	II	**126BSC02BITDSC02T**	Microbiologicalmethods &Techniques
		DSC2	II	**126BSC02BITDSC02L**	Microbiological methods&Techniqueslab
9.	Microbiology	DSC1	I	**126BSC01MIBDSC91T**	GeneralMicrobiology
		DSC1	I	**126BSC01MIBDSC01L**	Microbiol ogyLab-1
		DSC2	II	**126BSC02MIBDSC02T**	Microbial Biochemistry and Physiology
		DSC2	II	**126BSC02MIBDSC02L**	Microbiol ogyLab-2
10	Computer Science	DSC1	I	**126BSC01CSCDSC91T**	Computer Fundamentalsand ProgramminginC
		DSC1	I	**126BSC01CSCDSC01L**	CProgrammingLab
		DSC2	II	**126BSC02CSCDSC02T**	DataStructuresusingC
		DSC2	II	**126BSC02CSCDSC02L**	DatastructuresLab
11	Geography	DSC1	I	**126BSC01GEGDSC91T**	Principles of Geomorpholo gy
		DSC1	I	**126BSC01GEGDSC01L**	TopographicalAnalysis
		DSC2	II	**126BSC02GEGDSC02T**	Introduction to Climatology
		DSC2	II	**126BSC02GEGDSC02L**	WeatherAnalysis

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST: BAGALKOTE

CHEMISTRY

FIRSTANDSECONDSEMESTERSYLLABUS

AsperNEP2020andadaptedfromRCU Belagavi

Applicable from the

AcademicYear2023-24

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										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Durationofexams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	126BSC01CHEDSC91T	Chemistry-1	40	60	100	4	-	-	4	2
	126BSC01CHEDSC01L	ChemistryLab-1	25	25	50	-	-	4	2	4
OEC1	126BSC01CHEOEC01T	Chemistryindaily life	40	60	100	3	-	-	3	2

SEMESTER-II										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	126BSC02CHEDSC02T	Chemistry-2	40	60	100	4	-	-	4	2
	126BSC02CHEDSC02L	ChemistryLab-2	25	25	50	-	-	4	2	4
OEC2	126BSC02CHEOEC02T	Moleculesoflife	40	60	100	3	-	-	3	2

ASSESSMENTMETHODS

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	**40 marks**
1st Internal Assessment Test for30 marks 1 hr after 8 weeks and2nd Internal Assessment Test for 30 marks 1 hr after 15 weeks. Average of two tests should be considered.	30
Assignment	10
Total	**40**

AssessmentCriteria	**25 marks**
1st Internal AssessmentTest for20 marks 1hrafter8 weeksand 2nd Internal Assessment Test for 20 marks 1 hr after 15weeks. Average of two tests should be considered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	**25 marks**
SemesterEndInternalAssessmentTestfor20marks2 hrs	20
Journal(PracticalRecord)	05
Total	**25**

QuestionPaperPattern:

Duration:2hr ***ISemesterB.Sc.*** **Sub: Code: MaximumMarks :60**

a. **AnsweranySIXQuestionsfromQuestion1**
b. **Answer anyThreeineachQuestionfrom2,3,4and5questions.**

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-Semester1

TitleoftheCourse:DSC-1:Subjectcode:**126BSC01CHEDSC91T**

Paper:Chemistry–1

Numberof Theory Credits	**Numberof lecture hours/ semester**	**Number of practical credits**	**Number of practicalhours /semester**
4	**56**	**2**	**56**
Content ofTheoryCourse1			

Unit–1Analyticalchemistry **14hours**

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 analyticalmethods 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 oferrors.Statisticaltreatmentoffinitesamples-mean,median,range,standarddeviation and variance. Numerical problems

Titrimetric analysis: Basic principle of titrimetric analysis. Classification, Preparationand dilution of reagents/solutions. Preparation of ppm level solutions from sourcematerials (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**

AtomicStructure: ReviewofRutherford'satomicmodel,Bohr'stheory,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,HeisenbergUncertaintyprincipleandtheirrelatedproblems.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 theatoms (atomic number up to 54).Concept of exchange energy. Anomalous electronic configurations. **9hrs**

Periodicpropertiesofelements:

Brief account on the following properties of elements with reference to s and p-block and trendsingroupsandperiods.Effectivenuclearcharge,screeningeffect,Slaterrules, atomic and ionic radii, ionization enthalpy, electron gain enthalpy, and electronegativity, Pauling / Allred-Rochow scales of electronegativity**. 5hrs**

Unit3BondinginOrganicMoleculesandMechanismofOrganicreactions14 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 Hyperconjugation with examples. Concept ofresonance and aromaticity, Huckel rule, anti-aromaticity explanation with examples. **6hrs**

MechanismsofOrganicReactions-I

Notations used to represent electron movements and directions of reactions- curlyarrows, formal charges. Types of bonds breaking- homolytic and heterolytic. Types of reagents-Electrophiles, nucleophiles, nucleophilicity and basicity. Types of organic reactions-substitution, addition, elimination, rearrangement and pericyclic reactions, explanationwith 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 14hours

Gaseousstate: Reviewofkinetictheory ofgases,vander Waalsequationofstate Boyletemperature.Molecularvelocity: Maxwell's Boltzmann distribution law of molecular velocities (most probable, average and root mean square velocities). Relationbetween RMS, average and most probable velocity and average kinetic energies (derivationnot required).Collision frequency,collisiondiameter,Collision cross-section,collisionnumberandmeanfreepath.Criticalphenomena:Andrewsisotherms ofCO_2,criticalconstantsandtheirdeterminationRelationbetweencriticalconstants and vander Waals equation(Derivation), continuity ofstates,lawof corresponding states. Numerical problems are to be solved wherever applicable. **8hrs Distribution Law:** Nernst Distribution Law - Statement and its derivation. Distribution constant, factors affectingdistribution 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 desilverisationof lead. Numerical Problems. **6hrs**

LEARNINGOUTCOMES/COURSEOUTCOMES:

Chemistry as Discipline Specific Course (DSC)

B.Sc. Semester –I; CHEMISTRY-1

After successful completion of three year degree program in Chemistrya 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 periodicityin properties, and classifythe 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, electrometriceffect, resonance effect and Hyper conjugation effect). Steric effect and theirapplications in explaining acidic strength of carboxylic acids, basicityof 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 andcyclohexane.
8. Understandthevariousconceptsofgeometricalisomerismandopticalisomerism. 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 theconditionsrequired for liquefactionofgases. Realisethat there is continuityin gaseous and liquid state.
12. Explainpropertiesofliquidsintermsofintermolecularattractions.
13. Understand principles of titrimetricanalysis.
14. Understand principles of different type's titrations. Titration curves forall typesof 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.

CHEMISTRYLAB(InorganicandOrganicAnalyses)

Afterstudyingthiscourseandperformingtheexperimentssetinitstudentwillbeableto:

1. Understandandpractice thecalibrationofglasswares(burette,pipette,volumetric flask).
2. Basic concepts involved in titrimetric analysis, primary standard substances, preparation of standard solutions.
3. Explaintheprinciplesofacid-base,redoxandiodometrictitrations.
4. Workout the stoichiometric relations based on the reactionsinvolved in the titrimetric analysis.
5. Basedonprinciplesoftitrimetricanalysisstudentcanperform
6. Describethesignificanceoforganicquantitativeanalysis.
7. Determinetheamountofphenol,aniline,amide,esterandformaldehydeinagiven solutionby performing blank titration and main titrations.
8. Determineaspirininthetabletbyhydrolysismethod.

Chemistry Lab-1:ListofexperimentstobeconductedCoursecode: 126BSC01CHEDSC01L;Paper:ChemistryLab-1

PART-A

1. Determinationofsodiumcarbonateandsodiumbicarbonateinamixture
2. Determination ofalkalipresentinsoaps/detergents
3. Determinationofoxalicacidusingpotassiumpermanganatesolution
4. StandardizationofEDTAsolutionanddeterminationofhardnessofwater
5. Determinationofphenol/anilinebybrominationmethod
6. Determinationofacetamide/ethylbenzoatebyhydrolysismethod

PART-B

7. PreparationofacetanilidefromanilineusingZn/aceticacid(Greenmethod)
8. Synthesisofp-nitroacetanilidefromacetanilideusingnitratingmixture
9. Brominationofacetanilide(i)Conventionalmethodand/or (ii)withcericammoniumnitrateandpotassiumbromide(Greenmethod).
10. Hydrolysisofmethylm-nitrobenzoatetom-nitrobenzoicacid(Conventional method)

Examination

Inthepracticalexamination,abatchofmaximum15(Fifteen)studentsmaybemade.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.**

PartA:Distributionofmarks

1. Accuracy:12(6+6)Marks
2. Techniqueandpresentation:03Marks
3. ReactionsandCalculations:05Marks

4. Viva:05Marks

Total25marks

Deductionofmarksforaccuracy:±0.4CC–6marks,±0.6CC-04marks, ±0.8CC-02marks,±1.0CC-01marks.Above±1.0CC-00marks.

PartB:DistributionofMarks:

1. Reaction&Mechanism-04marks,
2. Calculationoftheoreticalyield–02 mark,
3. Observedyield -10marks,
4. M.P-004marks,
5. Viva-Voce-5marks,

Total=25marks.

Deductionofmarksforobservedyield:Lessthan10%-10marks,11-15%-8marks, 16-20%- 6marks, 21-25%- 4 marks& above25%- 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. FundamentalsofAnalyticalChemistry,D.A.Skoog,D.M.West,HollerandCrouch,8th edition, Saunders College Publishing, New York (2005).
3. AnalyticalChemistry,G.D.Christian,6thedition,Wiley-India(2007).
4. PracticalVolumetricAnalysis,PeterACMcPherson,RoyalSocietyof Chemistry, Cambridge, UK (2015).
5. Morrison,R.N.&Boyd,R.N.*OrganicChemistry*,DorlingKindersley(India)Pvt. Ltd. (Pearson Education)
6. Finar,I.L.*OrganicChemistry(VolumeI)*,DorlingKindersley(India)Pvt.Ltd. (Pearson Education)
7. McMurry, J. E. *Fundamentals of Organic Chemistry*, 7th Ed. Cengage LearningIndia Edition, 2013
8. OrganicReactionmechanismbyV.K.AhluwaliaandK.Parashar(Narosa Publishers).
9. OrganicChemistrybyS.M.Mukherji,S.P.SinghandR.K.Kapoor.(Narosa Publishers)
10. A GuidebooktomechanisminOrganicChemistrybyPeterSykes.Pearson.

BScSemester1–B.Sc/(Hons)Chemistry

TitleoftheCourse:OpenElective(OE-1):CHEMISTRYINDAILYLIFECourse code: 126BSC01CHEOEC01T

Courses	Credits	No. of Classes /Week	Total No. of Lectures/Hours	Duration of Examin hrs	Internal AssessmentMarks	SemesterEnd Exam Marks	Total Marks
Theory	03	03	42	2	40	60	100
ContentofTheoryCourse1							**42Hrs**

Unit–1 **14hours**

Dairy Products: Composition of milk and milk products. Analysis of fat content, minerals in milkandbutter.Estimationofaddedwaterinmilk.Beverages:Analysisofcaffeineincoffeeand 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.Artificialsweeteners:Aspartame,saccharin,dulcin,sucralose, andsodiumcyclamate.Flavors:Vanillin,alkylesters(fruitflavors),andmonosodiumglutamate.

Artificialfoodcolorants: Coal tardyes and non-permitted colors andmetallicsalts.Analysis of pesticide residues in food.

Unit–2 **14hours**

Vitamins: ClassificationandNomenclature.Sources,deficiencydiseases,andstructuresof Vitamin A1,Vitamin B1,Vitamin C,Vitamin D,Vitamin E &VitaminK1.

Oils andfats: 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, manufacturingof soaps and detergents, composition and uses.

Unit–3 **14hours**

ChemicalandRenewableEnergySources:

Principlesandapplicationsofprimary&secondarybatteriesandfuel cells.Basicsof solarenergy, future energy storer.

Polymers: Basicconceptofpolymers,classificationandcharacteristicsofpolymers.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-friendlypolymers.

COURSEOUTCOMES:OEC-1Chemistry

Oncompletionofthecoursestudentswillbeable to:

- Understand thechemicalconstituentsinvariousdaytoday materialsusingbyacommon man.
- Understandthechemicalconstituentsinfertilizers,insecticidesandpesticides,chemical explosives etc.
- Understand thechemicalconstituentsinpolymers,surfacecoatingsetc.

ReferencesTextBooks

1. B. K. Sharma:Introduction toIndustrialChemistry,GoelPublishing,Meerut(1998)
2. MedicinalChemistry-AshtoushKar.
3. AnalysisofFoods–H.E.Cox:13.
4. ChemicalAnalysisofFoods–H.E.CoxandPearson.

5. Foods:FactsandPrinciples.N.ShakuntalaManyandS.Swamy,4th ed.NewAgeInternational (1998)
6. PhysicalChemistry–PlAtkinsandJ.dePaula–7th Ed.2002,OxfordUniversityPress.

BScSemester2–Chemistry(Hons)

TitleoftheCourse:DSC-2:Subjectcode:126BSC02CHEDSC02T

Paper:Chemistry– 2

Number of Theory Credits	Number oflecture hrs/ semester	Numberof practical Credits	Numberof practical hrs/sem
4	56	**2**	**56**
ContentofTheoryCourse2			**56Hrs**

Unit–1Chemicalbonding,molecularstructure 14hours

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

Polarizingpowerandpolarizability:Fajan'srules,ioniccharacterincovalentcompounds and percentage ofionic 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 ofatomicorbitals,nonbondingcombination of orbitals, MO treatment of homonuclear diatomic molecules: H_2,O_2,N_2 and ions of 1st and 2nd periods: He_2^{+1}, $O_2^{+1}$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

StrengthsofOrganicacidandbases:Comparativestudy withemphasisonfactorseffecting pKa values. Relative strength of aliphatic and aromatic carboxylic acids-Acetic acid and chloroacetic acid,aceticacid and propionic acid, aceticacidandBenzoicacid.Steric effect-Relative stability of trans and cis-2-butene.

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

Stereoisomersim: Definition of stereoisomerism, conformational isomers and configurational isomers(distinctionbetweenconformationandconfiguration).Newman,Sawhorseand 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.

Opticalisomerism: Chirality/asymmetry,enantiomerism,diastereomerismandmeso

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 significanceof chirality.

10hrs

Unit-3Solids&Liquidcrystals 14hours

Liquid Crystals: Explanation, classification with examples- Smectic, nematic, cholesteric, disc shaped and polymeric. Structures of nematic and cholesteric phases-molecular arrangements innematic 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,Lawofsymmetry,Symmetryelements,X–Raydiffractionbycrystals:Bragg'slaw and derivation of Bragg's equation, Structure of NaCl. KCl and CsCl, Defects in crystals,glasses and liquid crystals. Numerical problems. **8hrs**

Unit-4ChemicalKineticsI,Liquidstate &GravimetricAnalysis 14hours

Chemical Kinetics I: Review of reaction rates, order and molecularity. Factors affecting ratesof 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**

Liquidstate: Molecularforcesandgeneralpropertiesofliquids**.**

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 capillaryrisemethod,dropweightanddropnumbermethodsusingstalagmometer. Effect of temperature on surface tension. Parachor, Additive and constitutive properties:atomic and structural parachor.Elucidation of structure of benzene and benzoquinone. .

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

Refractiveindex: Definition, Specific and molar refraction. Determination of refractive index usingAbbe'srefractometer.Additiveandconstitutiveproperties:Numericalproblemsareto 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**

ReferenceBooks

1. **InorganicChemistry**

1. Lee,J.D.*ConciseInorganicChemistry*ELBS,1991.
2. Cotton,F.A.,Wilkinson,G.&Gaus,P.L.*BasicInorganicChemistry*,3rd ed.,Wiley.
3. Douglas,B.E., McDaniel, D.H.&Alexander, J. J.*Conceptsand Modelsin Inorganic Chemistry*, John Wiley & Sons.
4. Huheey,J.E.,Keiter,E.A.,Keiter,R.L.&Medhi,O.K.*InorganicChemistry:Principlesof Structure and Reactivity*, Pearson Education India,2006.
5. Shriver,D.F.&Atkins,P.W.*InorganicChemistry*,OxfordUniversityPress.
6. Wulfsberg,G.*InorganicChemistry*,VivaBooksPvt.Ltd.
7. Rodgers,G.E.*Inorganic&SolidStateChemistry*,CengageLearningIndiaLtd.,2008.
8. Mark Weller and FraserArmstrong, 5th Edition, Oxford University Press (2011-2012) Adam,D.M.*InorganicSolids:Anintroductiontoconceptsinsolid-statestructuralchemistry*. John Wiley & Sons, 1974.
9. G.L.Miessler&DonaldA.Tarr:*InorganicChemistry*,PearsonPublication.
10. Mahan,B.H.*UniversityChemistry*3rdEd.Narosa(1998).
11. Petrucci,R.H.*GeneralChemistry*5thEd.MacmillanPublishingCo.:NewYork(1985).

OrganicChemistry

1. OrganicChemistry-P.Y.Bruice,7thEdition,PearsonEducation Pvt.Ltd.,NewDelhi(2013).
2. HeterocyclicChemistry-R.K.Bansal,3rdEdition,New-AgeInternational, NewDelhi,2004
3. McMurry, J.E. *Fundamentals of OrganicChemistry*,7thEd. Cengage Learning IndiaEdition, 2013.
4. Sykes,P.*AGuidebooktoMechanisminOrganicChemistry*,OrientLongman,NewDelhi(1988).
5. Stereochemistry-ConformationandMechanism-P.S.Kalsi,Wiley-EasternLtd,NewDelhi.
6. Morrison,R.T.&Boyd,R.N.*OrganicChemistry*,Pearson,2010.
7. Bahl,A.&Bahl,B.S.*AdvancedOrganicChemistry*,S.Chand,2010.
8. GrahamSolomons,T.W.,Fryhle,C.B.&Snyder,S.A.*OrganicChemistry*,JohnWiley&Sons (2014).
9. OrganicChemistryVolume-I,II-I.L.Finar,6thEdition,ELBSLondon(2004).
10. OrganicChemistry-F.A.Carey,4thEdition,McGrawHill(2000).
11. ModernOrganicChemistry-R.O.C.NormanandD.J.Waddington,ELBS,1983
12. UnderstandingOrganicreactionmechanisms-A.Jacobs,CambridgeUniv.Press,1998
13. OrganicChemistry-L.Ferguson,VonNostrand,1985
14. OrganicChemistry-M.K.Jain,Nagin&Co.,1987
15. OrganicChemistry-MehtaandMehta.

PhysicalChemistry

1. Barrow,G.M.*PhysicalChemistry*Tata McGraw-Hill(2007).
2. Castellan,G.W.*PhysicalChemistry*4th Ed.Narosa(2004).
3. Kotz,J.C.,Treichel,P.M.&Townsend,J.R.*GeneralChemistry*CengageLearningIndia Pvt.Ltd.,NewDelhi(2009).
4. P.W.Atkins:PhysicalChemistry.
5. W.J.Moore:PhysicalChemistry
6. TextBookof PhysicalChemistry-P.L. Soni, S. Chand&Co.,1993
7. TextBookofphysicalchemistry-S.Glasstone,MackmillanIndiaLtd.,1982

8. PrinciplesofPhysicalChemistry- B.R.Puri,L.R. SharmaandM.S.Patania, S.L.N.Chand & Co. 1987
9. PhysicalChemistry-AlbertyR.A.andSilbey,R.J.JohnWileyandsons,1992
10. PhysicalChemistry-G.M.Barrow,McGrawHill,1986
11. PhysicalChemistry(3rdEdition)-GilbertW.Castilian,NarosaPublishingHouse,1985
12. ChemicalKineticsbyK.J. Laidler,TataMcGrawHillPublishingCo.,NewDelhi.
13. KineticsandReactionMechanismsbyFrostandPearson,Wiley,NewYork.

AnalyticalChemistry

1. Jeffery,G.H.,Bassett,J.,Mendham,J.&Denney,R.C.*Vogel'sTextbookofQuantitative Chemical Analysis*, JohnWiley&Sons,1989.
2. Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. *Instrumental Methods of Analysis*,7th Ed. Wadsworth Publishing Company Ltd.,Belmont, California,USA,1988.
3. Christian,G.D;*AnalyticalChemistry*,VIEd.JohnWiley&Sons,NewYork,2004.
4. Harris,D.C.*ExploringChemicalAnalysis*,Ed.NewYork,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

TitleoftheCourse:DSC-2:Subjectcode:126BSC02CHEDSC02L

;Paper:ChemistryLab-2

PART-AInorganic Chemistry

TITRIMETRY

1. Determinationofcarbonateandhydroxidepresentinamixture.
2. Standardizationofpotassiumpermanganatesolutionanddeterminationofnitritein awater sample
3. Determinationofchlorineinbleachingpowderusingiodometricmethod.

GRAVIMETRY

1. Determination of Ba^{2+} as $BaSO_4$
2. Determination of Cu^{2+} as CuSCN

PART-BPhysicalChemistry

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. Studyofthevariationofviscosityofsucrosesolutionwiththeconcentrationofasolute.
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. Studyofvariationofsurfacetensionofdetergentsolutionwithconcentration.
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. Anyoneexperiment fromPart-Aor Bcan be given byselection done bythe students based on lots. **Viva questions must be asked on any of the experiments prescribed in the practical syllabus.**

Part A1: Distributionofmarks

1. Accuracy:12(6+6)Marks
2. Technique andpresentation:03Marks
3. ReactionsandCalculations:05Marks
4. Viva:05Marks

Total25marks

Deductionofmarksforaccuracy:±0.4CC–6marks,±0.6CC-04marks, ±0.8 CC- 02 marks, ±1.0 CC - 01 marks. Above ±1.0 CC - 00 marks

Part A2:Distributionofmarks

1. Accuracy:12Marks
2. Technique andpresentation:03Marks
3. ReactionsandCalculations:05Marks

4. Viva:05Marks

Total25marks

Deductionofmarksforaccuracy:±6mg–12marks,±7mg-10marks,

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

Part B: Distribution of marks

1. Accuracy:12Marks
2. Techniqueandpresentation:03marks
3. GraphsandCalculations:05 Marks
4. Viva:05Marks

Total25marks

Deductionofmarksforaccuracy:Errorupto5%-12marks, 6-10%09marks, 11-15%6marks,16%orabove3marks.

B.Sc.Semester–II

Open Elective Course-Chemistry

TitleoftheCourse:OEC-2:Subjectcode:126BSC02CHEOEC02T;

Paper:MoleculesofLife

Course	Credits	No.of Classes/ Week	TotalNo. of Lecture Hours	Duration of Exam inhrs	Internal AssessmentMarks	SemesterEnd Exam Marks	Total Marks
Theory	03	03	42	2	40	60	100

UNITI

Carbohydrates

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

Disaccaharides:OccuranceofdisaacharidesSucrose,MaltoseandLactose). 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,glycosidiclinkage,structure(explanationonly).Biological importanceof carbohydrates **8hrs**

AminoAcids,PeptidesandProteins

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 andnon-essential-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 quaternarystructures (diagrams not required).Denaturation of protein.

8hrs

UNITII

Enzymesandcorrelationwithdrugaction

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, binding role of –OH group, -NH_2group, double bond and aromatic ring. **4hrs**

Oils and fats

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

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

Introductiontolipids, classification. Biological importance oftriglycerides, phospholipids, glycolipids,andsteroids(cholesterol). **6hrs**

UNITIII

NucleicAcids

Componentsofnucleicacids:Adenine,guanine,thymineandcytosine(Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature),StructureofpolynucleotidesStructureofDNA(Watson-Crickmodel) andRNA(typesofRNA),GeneticCode,BiologicalrolesofDNAandRNA: 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**

CourseOutcome/LearningOutcome:

Afterstudyingthispaperthestudentwouldbeableto

1. Acquire knowledgeaboutdifferenttypesofsugarsandtheirchemicalstructures.
2. Identifydifferenttypesofaminoacidsanddeterminethestructureofpeptides.
3. Explaintheactionsof enzymesinourbodyandinterpretenzymeinhibition.
4. Predictactionofdrugs.Depictthebiologicalimportanceofoilsandfats.Importance of lipids in the metabolism Differentiate RNA and DNA and their replication. Explain production of energy in our body.

ReferenceBooks:

1. Morrison,R.T.&Boyd,R.N.*OrganicChemistry*,DorlingKindersley(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'sPrinciplesofBiochemistry7thEd.*,
5. W. H. Freeman.Berg,J.M., Tymoczko,J.L.&Stryer,L.*Biochemistry*,2002.

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

PHYSICS

FIRSTANDSECONDSEMESTERSYLLABUS

AsperNEP2020andadaptedfromRCUBelagavi,applicablefrom theAcademic Year 2023-24

SUBJECT:PHYSICS

PROGRAMSTRUCTURE

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	Coursecode	Titleofthe Paper	Marks			Teaching hours/week			Credit	Duratio n of exams (Hrs)
			IA	SEE	Total	L	T	P		
DSC1	**126BSC01PHYDSC91T**	Mechanics&Properties of Matter	40	60	100	4	-	-	4	2
	126BSC01PHYDSC01L	PracticalI	25	25	50	-	-	4	2	4
OEC1	126BSC01PHYOEC01T	Energy Sources	40	60	100	3		-	3	2

SEMESTER-II										
Category	**Coursecode**	**Titleof the Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02PHYDSC02T**	Electricityand Magnetism	40	60	100	4	-	-	4	2
	126BSC02PHYDSC02L	Practical-II	25	25	50	-	-	4	2	4
OEC2	126BSC02PHYOEC02T	Optical Instruments	40	60	100	3	-	-	3	2

CourseContentSemester–I
MechanicsandPropertiesofMatter

CourseTitle:MechanicsandPropertiesofMatter	CourseCredits:4
TotalContactHours:52	DurationofESA:3hours
FormativeAssessmentMarks:30	SummativeAssessmentMarks:70

CourseOutcomes(COs)
CO-1:Willlearnfixingunits,tabulationofobservations,analysisofdata(graphical/analytical)
CO-2:Willlearn aboutaccuracyofmeasurementandsourcesoferrors,importanceofsignificantfigures.
CO-3:Willknowhowgcanbedeterminedexperimentallyandderivesatisfaction.
CO-4:Willseethedifference betweensimpleandtorsional pendulumand theiruse inthedetermination of various physical parameters.
CO-5:Willcometoknow howvarious elasticmodulicanbedetermined.
CO-6:Willmeasuresurfacetensionandviscosityandappreciate themethodsadopted.
CO-7:Will gethandsonexperienceofdifferentequipment.

COURSE-WISESYLLABUS

SemesterI

MechanicsandPropertiesofMatter

Year	I	CourseCode:126BSC01PHYDSC91T	Credits	04
Sem.	1	CourseTitle:MechanicsandProperties ofMatter	Hours	52

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:2hrs.

UnitNo.	CourseContent	Hours
UnitI	**Conservation Laws:**Law of conservation oflinear momentum.Centre of mass and expression for position vector, velocity, acceleration and force of Centre ofmass.Distinctionbetween laboratory frame ofreference 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 frameofreference(ii)centreofmass 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 forsingle stage rocket. Necessity of multi stage rocket. Basics of angular momentum andtorque, relation between angular momentum and torque. Law of conservationof angular momentum with examples. Concept of work and power. Law of conservation of energywith examples. Work energytheorem. Simple harmonic oscillations of light spiral spring.Problems	13
Activity/ SelfStudy	1Students can tryand find everydayexamples of conservation of energy. For example: i) Whathappensinsolarpanels ii) Pushinganobjectonthetableitmoves iii) Movingcarhitsaparkedcarcause'sparkedcartomove. Inthesecases,energyisconserved.How?Understandandverifyifpossible.	
UnitII	**Gravitation:** Newton's law of Gravitation (statement). Expressions for escape velocityand orbital velocity. Kepler's laws of planetarymotion. Derivation for Kepler's 2ndand3rdlaw.ConceptofSatellite, derivationfor 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 uniformrodand(iii)circulardisc.Theory ofcompoundpendulumandbarpendulum. Theoryofflywheelanditsapplications.Problems	13
Activity/ SelfStudy	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.	

.	2.PerformingexperimentsongravityandKepler'slawsaresomewhat difficult. However, students can prepare suitable charts, understand and give Seminar talks in the class. Websites can help in this regard.	
UnitIII	**Elasticity:** Definition ofStress-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.DeterminationofYoung'smodulusby bending of beam supported at its ends and loaded at middle. Problems	13
Activity/ SelfStudy	1. VerificationofHook'slaw Arrange a steel spring with its top fixed with a rigid support on a wall and a meter scale alongside. Add 100 gload 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 agraph 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 loadsand find out elastic limit of the material. 2. Repeat the above experiment with rubber and other materials and find out what happens after exceeding elastic limit.	
UnitIV	**Surface tension:** Definition of surface tension, Angle of contact, Surface energy, relation between surface tension and surface energy, pressuredifference across curved surface. Excess of pressure inside spherical liquiddrop, Capillary rise, derivation of expression for rise of liquid in a capillarytube. 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 ViscositybyPoisulle's method, Stokes law with derivation and expression for terminal velocity. Effect of temperature on viscosity. Problems	13
Activity/ Selfstudy	1. Measuresurfacetensionofwaterandothercommonliquidsandcompareand learn i) WhywaterhashighST?Givereasons. ii) Checkwhether STisa functionof temperature?Youcando itby heating the water to different temperatures and measure ST. iii) PlotST.versusTandlearnhowitbehaves. iv) Mix some quantityof kerosene or anyoil to water and measure ST. Check whether ST for the mixture is more or less than pure water. Give reasons. 3.Collectasetofdifferentliquidsandmeasure theirviscosity. i) Find out whether sticky or non-sticky liquids are most viscous. Think of reasons. ii) Mix non-sticky liquid to the sticky liquid in defined quantities and measure viscosity.Findoutwhetherviscosityisincreasingordecreasing withincrease of non-sticky liquid concentration. iii) Do the above experiment bymixing stickyliquid to then on-stickyliquid. Find out change in viscositywith increase of concentration of sticky liquid. iv) Thinkwhyoneshouldknowviscosityoftheliquid.	

RecommendedLeaningResources	
TextBooks	**Textbooks** 1. MechanicsbyD.S.Mathur,NewEdition2000,S.Chand&Co. 2. ClassicalMechanicsbyJ.C.Upadhya,2019,HimalayaPublishers. 3. Mechanics and Relativity by Vidwan Singh Soni,3rd Edition, PHIL earning Pvt. Ltd. 4. Mechanics Berkeley Physics Course, Vol.1: Charles Kittel,*et.al*.2007, Tata McGraw-Hill. 5. EngineeringMechanics,BasudebBhattacharya, 2ndEdn, 2015,Oxford UniversityPress. 6. ElementsofpropertiesofmatterbyD.S.Mathur,2010,S.Chand&Co. 7. PropertiesofMatterbyBrijlal& Subramanyam.
Reference Books	1. Physics:Resnick,Halliday&Walter,9thEdn,2010,Wiley. 2. PhysicsbyHallidayandResnick,Vol1. 3. UniversityPhysics,RonaldLaneReese,2003,ThamsonBrooks/Cole.

LaboratoryExperiments:

NOTE:MinimumofEightexperimentshastobeperformed

Year	I	**CourseCode:126BSC01PHYDSL**	**Credits**	2
Sem.	1	**Course Title: Practical-I**	**Hours**	4 hrs/week

FormativeAssessmentMarks:25	SummativeAssessmentMarks:25	DurationofESA:4hrs.

Sl.No	**Experiment**
1	Determinationofgusingbarpendulum(LversusTandLversusLT2graphs)
2	DeterminationofmomentofinertiaofaFlyWheel
3	Determinationofmomentofinertiaofanirregularbody
4	Determinationofrigiditymodulususingtorsionalpendulum
5	Verificationofparallelaxistheorem
6	Verificationofperpendicularaxistheorem
7	DeterminationofYoung'sModulusofabarbybendingmethod
8	Verificationof Hook'sLaw bySearle'smethod.
9	Young'smodulusbycantilever–LoadversusDepressiongraph
10	Young'smodulusbyKoenig'smethod
11	Young'smodulusbystretching(Searle'sapparatus).
12	Modulusofrigidity(twisting)
13	ViscositybyStoke'smethod
14	Radiusofcapillarytubebymercurypelletmethod
15	Surfacetensionbydropweightmethod
16	Criticalpressureforstreamlineflow
RecommendedLeaningResources	

TextBooks	1.PracticalPhysics-M.A.Hipparagi
Reference Books	1. Physicsthroughexperiments,byB.Saraf,2013,VikasPublications. 2. A labmanualofPhysicsforundergraduateclasses,1st Edition,VikasPublications. 3. BSc Practical Physics by CL Arora, Revised Edition 2007, S. Chand & Co.4.Anadvancedcoursein practical physics, D. Chattopadhyay, PC Rakshit, B.Saha, RevisedEdition2002,NewCentralBookAgencyPvtLtd.

OPEN-ELECTIVESYLLABUS:

Year	I	**CourseCode:**126BSC01PHYOEC01T **Course Title:EnergySources**		**Credits**	03
Sem.	1			**Hours**	40
Formative Assessment Marks:40		SummativeAssessmentMarks:60	DurationofESA:02hrs.		

UnitNo.	**CourseContent**	**Hours**
UnitI	**Introduction:** Energy concept-sources in general, its significance & necessity. Classification of energysources: Primary and Secondaryenergy, Commercial and Non-commercial energy, Renewable and Non-renewable energy, Conventional and Non-conventional energy, Based on Origin-Examples and limitations. Importance of Non-commercial energy resources.	**05**
	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, Biogasgeneration,geothermalenergytidalenergy,Hydroelectricity.	**05**
UnitII	**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&greenenergy&theirrelatedtechnology.	**10**
UnitIII	**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, solarcooker, solar green houses, solar cell –brief discussion of each. Need and characteristics of photovoltaic(PV) systems, PV models and equivalent circuits, and sun Trackingsystems.	**10**
UnitIV	Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies. Ocean Energy Potential against Wind andSolar,WaveCharacteristicsandStatistics,WaveEnergyDevices.Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy.	**08**
	Geothermalandhydro energy: GeothermalResources,Geothermal	**02**

	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. Conversionofvibrationtovoltageusingpiezoelectricmaterials. 3. Conversion of thermal energyinto voltage using thermoelectric (using thermo couples or heat sensors) modules. 4. ProjectreportonSolarenergyscenarioinIndia 5. ProjectreportonHydroenergyscenarioinIndia 6. Projectreportonwindenergyscenarioin India 7. FieldtriptonearbyHydroelectricstations. 8. Fieldtripto windenergystationslikeChitradurga,Hospet,Gadag,etc. 9. FieldtriptosolarenergyparkslikeYeramarasnearRaichur. 10. Videosonsolarenergy,hydroenergyandwindenergy.	
	ReferenceBooks: 1. Non-conventional energy sources- G.DRai-Khanna Publishers, NewDelhi 2. Solarenergy-MPAgarwal-SChandandCo.Ltd. 3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing CompanyLtd. 4. Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford UniversityPress, in association with The Open University. 5. Dr. P Jayakumar, Solar Energy: Resource Assessment Handbook, 2009 6. J.Balfour,M. ShawandS. Jarosek, Photovoltaics, Lawrence J Goodrich (USA). http://en.wikipedia.org/wiki/Renewable_energy	

Semester-II

Electricity&Magnetism

CourseTitle:ElectricityandMagnetism	CourseCredits:4
TotalContactHours:52	DurationofESA:2hours
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60

CourseOutcomes(COs)
i. Demonstrate Gauss law, Coulomb's law for the electric field, and applyit to systemsof point chargesas well as line, surface, and volume distributions of charges.
ii. Explainanddifferentiate thevector(electricfields, Coulomb'slaw)andscalar(electric potential, electric potential energy) formalisms of electrostatics.
iii. ApplyGauss'slawofelectrostaticstosolveavarietyofproblems.
iv. Describethemagneticfieldproducedbymagneticdipolesandelectriccurrents.
v. ExplainFaraday-Lenz andMaxwell laws toarticulate therelationship betweenelectric and magnetic fields.
vi. Describehowmagnetismisproduced andlistexampleswhereitseffectsare observed.
vii Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors andto describe the graphical relationship of resistance, capacitor and inductor.
vii. ApplyvariousnetworktheoremssuchasSuperposition,Thevenin,Norton, Reciprocity, •Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

Year	I	CourseCode:126BSC02PHYDSC02T	Credits	4
Sem.	2	CourseTitle:ElectricityandMagnetism	Hours	52

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	Durationof ESA:2hrs.

UnitNo.	CourseContent	Hours
UnitI	**Vector Analysis:** Scalar and Vector Products. Gradient of scalar and its physical significance. Divergence of vector and its physical significance. Curl of vector and its physical significance. Vector integration; line, surface & volume integrals of a vector field. Gauss Divergence theorem & Stokes theorem (statement). Problems **Maxwell's Electromagnetic Theory:** Derivation of Maxwell's equations in differential form. Mention of Maxwell's equations in integral form and their physical significances. Derivation for general plane wave equation in free space. Transversenatureofradiation. Derivation ofPoynting's theorem. Problems	13
Activity/Self Study	Solvingproblemsongradient,divergence&curlofavector	
UnitII	**DC Circuit Analysis:** Voltage and current sources. Kirchhoff's current and voltage laws. Derivation of Thevenin's Theorem. Derivation of Norton's Theorem. Derivation of Superposition Theorem. Derivation of Maximum Power Transfer Theorem. Problems **Transient Circuits:** Theory of growth and decay of current in RL circuit. Theoryofcharging and discharging of capacitor in RC circuit. Time constants of RL and RC circuits. Measurement of high resistance by leakage method.Problems	13
Activity/Self Study	1. Solving problems on Thevenin's, Norton's, Superposition and Maximum Power Transfer Theorems. 2. Charginganddischargingofacapacitorthroughhighresistance. 3. 3.Measurmentof timeconstantofRLandRCcircuit.	
UnitIII	**Magneto statics:** Statement of Biot Savart's law. Derive an expression for Magnetic field at a point (1) due to a straight conductor carrying current (ii) along the axis of the circular coil carrying current (iii) along the axis of solenoid. Principle, construction and theory of Helmholtz Galvanometer. Problems **Alternating Current:** Definitions of average, peak and rms values of AC. AC circuits containing LR, CR and their responses (usingj operator). Expressions for impedance, current & phase angle in series LCR circuit using j operator. Expressions for admittance and condition for resonance in parallel, LCRcircuit using j operator. Concept of Series resonance & parallel resonance (sharpness,half power frequency,quality factor,voltage magnification). Comparison between Series resonance & parallel resonance. DeSauty's Bridge. Problems	13
Activity/Self Study	1. Experiments to showthemagnetic field due to straight conductor, circular coil and solenoid. 2. ConstructionofHelmholtzcoilusingPVCpipeandcopperwire.	

.	.ToshowthelaggingofcurrentandvoltageinRL,RCandRLCcircuits.	
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	1. ToshowtheworkingofBallisticGalvanometer 2. WorkingofCRO andits applications.	
RecommendedLeaningResources		
Print Resources	1) Electricity and magnetism by BrijLal and N Subrahmanyam, Rathan Prakashan Mandir, Nineteenth Edition, 1993. 2) Principles of Electronics byVK Mehta and Rohit Mehta, S Chand &Company, Eleventh Edition, 2008. 3) Fundamentals of Magnetism & Electricity: D.N.Vasudeva, S Chand Publication, (2011). 4) Fundamentals of ElectricityandMagnetism–BasudevGhosh (Books & Allied NewCentral Book Agency, Calcutta, 2009). 5) Electricity&Magnetism:B.S.Agarwal,KedarnathRamnathPublication(2017). 6) ElectricityandMagnetismwithElectronics:Dr.K.K.Tewari,S.ChandPublications(1995). 7) Fundamentalsofelectriccircuittheory: Dr.D.Chattopadhyay&Dr.P.C.Rakshit,S.Chand Publications,7th Rev. Edn.(2006). 8) ElectricityandMagnetism:JohnYarwood,University TutorialPress,(1973). 9) Electricity&Magnetism,NSKhare& SSSrivastava,AtmaRam&Sons,NewDelhi. 10) Electricity&Magnetism, DL Sehgal,K L Chopra, NK Sehgal,SChand &Co, Sixth Edition,(1988). 11) Electricity&Electronics,DCTayal,HimalayaPublishingHouse,SixthEdition(1988). 12) ElectricityandMagnetism,SPTaneja,RChand&Co.NewDelhi.	

LaboratoryExperiments:

NOTE:MinimumofEightexperimentshastobeperformed

Year	I	**CourseCode:126BSC02PHYDSC02L**	**Credits**	2
Sem.	2	**CourseTitle:Practical-II**	**Hours**	4 hrs/week

FormativeAssessmentMarks:25	SummativeAssessmentMarks:25	DurationofESA:4hrs.

Sl.No	**Experiment**
1	Thevenin's&Norton'stheorem(LadderNetwork)
2	Thevenin's&Norton'stheorems(WhetstoneBridge)
3	Highresistancebyleakagemethod
4	TimeconstantofRCcircuitbychargingganddischargingmethod.
5	CalibrationofAmmeterusing HelmholtzGalvanometer
6	ConstantsofBallisticGalvanometer
7	LCRseries/parallelresonancecircuit
8	DeSauty's ACbridge
9	Self-InductancebyRayleigh'smethod
10	UseofCROtofindvoltage,frequencyandphase.
11	L& CbyEqualVoltageMethod
12	BlackBox-Identify&MeasureR,L&C
13	Anderson'sBridgetodetermine theself-inductanceofthe coil(L).
14	VerificationofSuperpositionTheorem
15	VerificationofmaximumPowerTransferTheorem

RecommendedLeaningResources

Reference Books	1. Physicsthroughexperiments.BSaraf etc,-VikasPublications(2013) 2. D P Khandelwal – A LaboratoryManual of Physics for Undergraduate Classes, Vikas Publications First ed (1985) 3. Advanced Practical Physics for Students – Workshop & Flint, Methuen & Co, London. 4. An Advanced Course in Practical Physics, D Chattopadhyay, P C Rakshit, BSaha, New Central Book Agency (P) Limited, Kolkata, Sixth Revised Edition, (2002) 5. B S C, Practical Physics, C LArora, S Chand &Co, New Delhi, (2007) Revised Edition. 6. B.Sc. Practical Physics, Geeta Sanon R. Chand & Co. New Delhi Rani Channam University, Belagavi, B.Sc.(CBCS) Physics Syllabus

OPEN-ELECTIVESYLLABUS:

Year	I	**CourseCode:**126BSC02PHYOEC02T	**Credits**	03
Sem.	2	**CourseTitle:**OpticalInstruments	**Hours**	40
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60	Durationof ESA:.02hrs.	

UnitNo.	**CourseContent**	**Hours**
UnitI	**Basicsof Optics** Scope of optics, optical path, laws of reflection and refraction asper Fermat's principle, magnifying glass, Lenses (thick and thin),convex and concave lenses, Lens makers formulae for double concave and convex lenses, lens equation.	10
UnitII	Focalandnodalpoints,focallength,imageformation, combination of lenses, dispersion of light: Newton's experiment, angular dispersion and dispersion power. Dispersion without deviation. (Expressions need not be derived, but have to be discussed qualitatively).	10
UnitIII	**Cameraandmicroscopes** Human eye (constitution and working),Photographic camera (principle, construction and working), construction, working and utilities of Simple microscopes, Compound microscope, Electron microscopes, Binocular microscopes **Self-study** Experimental determination of magnifying power of a microscope.(Construction part can be discussed through block diagrams)	10
UnitIV	**TelescopesandSpectrometer** 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 refractive index. **Self-study** Telescopes used at different observatories in and outside India. Hydropower resources, hydropower technologies, environmental impact of hydro power sources. Carboncapturedtechnologies,cell,batteries,powerconsumption	10

	Activities: 1) Find position and sizeof the image in a magnifying glass and magnification. 2) Observerainbowsandunderstandoptics. 3) Createarainbow. 4) Findoutwhatmakesacameratobeofgoodquality.	
	5) Observethedispersionoflightthroughprism. 6) Makeasimpletelescopeusingmagnifyingglassandlenses. 7) Learnprincipleofrefractionusingprisms. 8) Check bendingof light in different substances and find out what matters here. 9) Learn about different telescopes used to see galaxies and their ranges. Manymore activities can be tried to learn optics by goingthrough you tubes and website's such as https://spark.iop.org,http://www.yenka.com,https://publiclab.orgetc.	

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

MATHEMATICS

FIRSTANDSECONDSEMESTERSYLLABUS

AsperNEP2020andadaptedfromRCUBelagavi,applicablefromthe

Academic Year 2023-24

SUBJECT:Mathematics

PROGRAMSTRUCTURE

Curricular andCreditsStructure underChoice BasedCredit System [CBCS]ofMathematics Major&OneMinorDisciplineSchemefortheThreeYear/FourYearsMathematicsB.Sc. /B.Sc.HonorsProgrammewitheffectfrom2023-24.

SEMESTER-I										
Category	Course code	TitleofthePaper	Marks			Teaching hours/week			Credit	Durationof exams(Hrs)
			IA	SEE	Total	L	T	P		
DSC1	**126BSC01MATDSC91T**	Algebra-Iand Calculus – I	40	60	100	4	-	-	4	2
	126BSC01MATDSC01L	Theory based Practical's onAlgebra -Iand Calculus– I	25	25	50	-	-	4	2	4
OEC1	126BSC01MATOEC01T 126BSC01MATOEC02T	Mathematics–I Business Mathematics–I	40	60	100	3		-	3	2

SEMESTER-II										
Category	Course code	TitleofthePaper	Marks			Teaching hours/week			Credit	Duration of exams(Hrs)
			IA	SEE	Total	L	T	P		
DSC 2	**126BSC02MATDSC02T**	Algebra-IIand Calculus - II	40	60	100	4	-	-	4	2
	126BSC02MATDSC02L	Theory based Practical's on Algebra-IIand Calculus – II	25	25	50	-	-	4	2	4
OEC 2	**126BSC02MATOEC03T 126BSC02MATOEC04T**	Mathematics–II Business Mathematics-II	40	60	100	3	-	-	3	2

ASSESSMENTMETHOD

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	30marks
1st InternalAssessment Testfor30 marksofduration1 hrafter 8 weeks and 2nd InternalAssessmentTest for 30 marks 1hr after 15 weeks. Average of two tests should be considered.	30
Assignment	10
Total	**40**
AssessmentCriteria	**25marks**
1st Internal Assessment Test for 20 marks of duration 1/2 hr after8weeksand2nd InternalAssessmentTestfor20marksof duration1hrafter15weeks.Averageoftwotestsshouldbe considered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	25marks
SemesterEndInternalAssessment Testfor20marksof duration2hrs	20
Journal(Practical Record)	05
Total	**25**

Question Paper Pattern:
Department of Mathematics

ISemesterB.Sc(Mathematics)

Sub: Code: MaximumMarks:70

a. AnsweranySixQuestionsfromQuestion1

b. AnsweranyThreeQuestionsfromQuestion2,3,4and5

Q.No.1.	**Answer any Five Questions (Two question from Each Unit)** **a.** **b.** **c.** **d,** **e.** **f.** **g.** **h.**	**2X6=12**
Q.No.2.	**(Should coverEntireUnit-I) a.** **b.** **c.** **d.**	**4X3=12**
Q.No.3.	**(Should cover EntireUnit-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-WISESYLLABUS

SemesterI

<table>
<tr><td>Year</td><td>I</td><td colspan="3">CourseCode:126BSC01MATDSC91T</td><td>Credits</td><td>04</td></tr>
<tr><td>Sem.</td><td>1</td><td colspan="3">CourseTitle:Algebra-IandCalculus–I</td><td>Hours</td><td>56</td></tr>
<tr><td colspan="2">CoursePre-requisites,if any</td><td colspan="5">NA</td></tr>
<tr><td colspan="2">FormativeAssessment Marks: 40</td><td colspan="3">SummativeAssessmentMarks:60</td><td colspan="2">DurationofESA:.02hrs.</td></tr>
<tr><td>Course Outcomes</td><td colspan="6">Thiscoursewillenablethestudentsto
• Learntosolvesystemoflinearequations.
• Solve thesystem ofhomogeneous andnon-homogeneouslinearof m equations in n variables by using concept of rank of matrix, finding eigen values and eigen vectors.
• Sketchcurves inCartesian,polarandpedalequations
• Students will be familiar with the techniques of integration and differentiation of function with real variables.
• IdentifyandapplytheintermediatevaluetheoremsandL’Hospital rule.</td></tr>
<tr><td>UnitNo.</td><td colspan="5">CourseContent</td><td>Hours</td></tr>
<tr><td>UnitI</td><td colspan="5">Matrix:RecapitulationofSymmetricandSkewSymmetric matrices,Cayley-Hamiltontheorem,inverseofmatricesby Cayley-Hamilton theorem (Without Proof). Algebra of Matrices;RowandcolumnreductiontoEchelonform.Rankof amatrix;Inverseofamatrixbyelementaryoperations;Solution of system of linear equations; Criteriafor existence ofnon-trivialsolutionsofhomogeneoussystemoflinear equations.Solutionofnon-homogeneoussystemoflinear equations.EigenvaluesandEigenvectorsofsquare matrices, real symmetric matrices and their properties, reduction of such matrices to diagonal form,</td><td>14</td></tr>
<tr><td>UnitII</td><td colspan="5">Polar Co-ordinates: Polar coordinates, angle between the radiusvectorandtangent.Angleofintersectionoftwocurves (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.</td><td>14</td></tr>
<tr><td>UnitIII</td><td colspan="5">Differential Calculus-I: Limits, Continuity, Differentiability and properties. Properties of continuous functions. Intermediate value theorem, Rolle’s Theorem , Lagrange’s Mean Value theorem, Cauchy’s Mean value theorem and examples. Taylor’s theorem, Maclaurin’s series,Indeterminateforms andevaluation oflimits using</td><td>14</td></tr>
</table>

	L'Hospitalrule.	
UnitIV	**SuccessiveDifferentiation**:nthDerivatives ofStandard functions $\square^{ax+b}$,$(\square\square+\square)^{m}$,log($\square\square+\square$),sin($\square\square+\square$),cos($\square\square+\square$),$\square^{ax}$ sin($\square\square+\square$),$\square^{ax}$cos($\square\square+\square$), Leibnitz theoremandits applications. Tracing of curves (standard curves)	14
RecommendedLeaning Resources		
Print Resources	**References:** 1. UniversityAlgebra-N.S.GopalaKrishnan,NewAgeInternational(P)Limited 2. TheoryofMatrices-BSVatsa,NewAgeInternationalPublishers. 3. Matrices-ARVasista,KrishnaPrakashanaMandir. 4. DifferentialCalculus-ShantiNarayan,S.Chand&Company,NewDelhi. 5. ApplicationsofCalculus,DebasishSengupta,BooksandAllied(P)Ltd.,2019. 6. Calculus–LipmanBers,Holt,Rinehart&Winston. 7. Calculus - SNarayanan& T. K. ManicavachogamPillay, S. Viswanathan Pvt. Ltd., vol. I & II. 8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA:Mc. Graw. 9. TextBookofB.Sc.Mathematics,GKRanganath,SChand&Company.	

Year	I	**CourseCode:126BSC01MATDSC01L** **CourseTitle:**Practical'sonAlgebra-Iand Calculus – I	**Credits**	02
Sem.	I		**Hours**	56
CoursePre-requisites,if any:		KnowledgeofProgramming		
FormativeAssessment Marks:25		SummativeAssessmentMarks:25	DurationofESA:03 hrs.	
Course Outcomes		Thiscoursewillenablethestudentsto • LearnFreeandOpenSourceSoftware(FOSS)toolsforcomputer programming Solveproblemonalgebraandcalculustheorystudiedin MATDSCT1.1 by using FOSS software. Acquireknowledgeofapplicationsofalgebraandcalculusthrough FOSS Practical/Lab Work to be performed in Computer Lab(FOSS) • Suggested Software's: Maxima/Scilab/Maple/MatLab/Mathematica/Phython/R		
		LabPractical's: **PartA:** Introductiontothesoftwareandcommandsrelatedtothetopic. 1. Computationofadditionandsubtractionofmatrices, 2. ComputationofMultiplicationofmatrices. 3. ComputationofTraceandTransposeofMatrix 4. ComputationofRankofmatrixandRowreducedEchelonform. 5. Computation ofInverseofaMatrixusingCayley-Hamiltontheorem. 6. Solvingthesystemofhomogeneousandnon-homogeneouslinear algebraic equations. **Part B:** 7. Finding thenthDerivativeof $\square^{ax}$,trigonometricandhyperbolic functions 8. FindingthenthDerivativeofalgebraicandlogarithmicfunctions. 9. FindingthenthDerivativeof$\square^{ax+b}$sin($\square\square+\square$),$\square^{ax+b}$cos($\square\square+\square$). 10. Finding the Taylor's and Maclaurin's expansions of the given functions. 11. Findingtheanglebetweentheradiusvector andtangent. 12. Finding thecurvaturesofthegivencurves. 13. Tracing ofstandardcurves(Cartesian,polarandparametric)		

EvaluationSchemeforLabExamination

AssessmentCriteria		Marks
Program–1fromPartA	WritingProgram	03
	ExecutionofProgram	07
Program-2fromPartB	WritingProgram	03
	ExecutionofProgram	07
Viva-Voce		05
Total		**25**

Semester II

Year	I	**CourseCode: 126BSC02MATDSC02T** **CourseTitle:**Algebra-IIandCalculus–II	**Credits**	04
Sem.	II		**Hours**	56
Course Pre-requisites,if any		NA		
FormativeAssessment Marks: 40		SummativeAssessment Marks: 60	DurationofESA:.02hrs.	
Course Outcomes		Thiscoursewillenablethestudentsto • RecognizethemathematicalobjectscalledGroups. • Linkthefundamentalconceptsofgroupsandsymmetriesofgeometrical objects. • ExplainthesignificanceofthenotionsofCosets,normalsubgroupsand factor groups. • Understandtheconceptofdifferentiation and fundamentaltheorems in differentiation and various rules. • Find theextremevaluesoffunctionsoftwovariables.		
UnitNo.		**CourseContent**		**Hours**
UnitI		**Real Number System:** Recapitulation of number system. Countable and uncountable sets, standard theorems. Real line, bounded sets, suprimum and infimum of a set, completeness properties of□, Archimedean property of □. Intervals, neighborhood of a point, open sets, closed sets, limit pointsand Bolzano-Weierstrasstheorem(Withoutproof).		14
UnitII		**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 theoremandits consequences. Fermat'stheorem,Euler's□		14
UnitIII		**PartialDerivatives**:Functions oftwoormore variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobiansand standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables, Maxima-Minimaoffunctionsoftwovariables		14

UnitIV	**IntegralCalculus**:Recapitulationofdefiniteintegrals and its properties. Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definitionof Double integralsanditsconversiontoiteratedintegrals. Evaluationofdoubleintegralsbychanging the order of integration and change of variables. Computation ofplane surfaceareas, volume	14
	underneath asurfaceofrevolution using double integral. Triple integral: Definition of tripleintegrals and evaluation-changeof variables, volumeastripleintegral.Differentiationunderthe integralsignbyLeibnitzrule.	
RecommendedLeaningResources		
Print Resources	**References** 1. TopicsinAlgebra,INHerstein,WileyEasternLtd.,NewDelhi. 2. Higher algebra, Bernard & Child, Arihant, ISBN: 9350943199/9789350943199. 3. Modern Algebra, Sharma and Vasista, Krishna Prakashan Mandir, Meerut, U.P. 4. DifferentialCalculus,ShantiNarayan,S.Chand&Company,NewDelhi. 5. IntegralCalculus,ShantiNarayanandPKMittal,S.ChandandCo. Pvt.Ltd., 6. Schaum'sOutlineSeries,FrankAyresandElliottMendelson,5thed. USA: Mc. Graw Hill., 2008. 7. MathematicalAnalysis,SCMalik,WileyEastern. 8. ACourseinAbstract Algebra,Vijay KKhannaandSK Bhambri, VikasPublications. 9. TextBookofB.Sc.Mathematics,GKRanganath,SChand&Company.	

<table>
<tr><td>Year</td><td>I</td><td colspan="2" rowspan="2">CourseCode:126BSC02MATDSC02L
CourseTitle:Practical'sonAlgebra-IIand Calculus – II</td><td>Credits</td><td>02</td></tr>
<tr><td>Sem.</td><td>II</td><td>Hours</td><td>56</td></tr>
<tr><td colspan="2">Course Pre-requisites,if any:</td><td colspan="4">KnowledgeofProgramming</td></tr>
<tr><td colspan="2">FormativeAssessment Marks: 25</td><td colspan="2">SummativeAssessmentMarks:25</td><td colspan="2">DurationofESA:03hrs.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">Thiscoursewillenablethestudentsto
• LearnFreeand OpenSource Software (FOSS)tools forcomputer programming
• SolveproblemonalgebraandcalculusbyusingFOSS software's.
• Acquire knowledge of applications of algebra and calculus through FOSS Practical/Lab Work to be performed in Computer Lab
Suggested Software's: Maxima/Scilab/Maple/MatLab/Mathematica/Phython/R.</td></tr>
<tr><td></td><td colspan="5">LabPractical's:

PartA:
1. Programforverificationofbinaryoperations.
2. Computationofidentityandinverseelementsofa group.
3. ProgramtoconstructCayley'stableandtestabelianforgivenfinite set.
4. Programtofindallpossiblecosetsofthegivenfinitegroup.
5. Programtofindgeneratorsandcorrespondingpossiblesubgroupsofa cyclic group.
6. ProgramstoverificationofLagrange's theoremwith suitable examples.

PartB:
7. Program toverifytheEuler's □functionforagivenfinitegroup.
8. ProgramtoverifytheEuler'stheoremanditsextension
9. Programstoconstructseriesusing Maclaurin's expansionfor functions of two variables.
10. Program to evaluate the line integrals with constant and variable limits.
11. ProgramtoevaluatetheDoubleintegralswithconstantandvariable limits
12. Programto evaluate theTripleintegralswithconstantand variable limits.</td></tr>
</table>

EvaluationSchemeforLabExamination

AssessmentCriteria		Marks
Program–1fromPartA	WritingProgram	03
	ExecutionofProgram	07
Program-2fromPartB	WritingProgram	03
	ExecutionofProgram	07
Viva-Voce		05
Total		**25**

OPEN-ELECTIVESYLLABUS(IstSemester):

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

Year	I	**CourseCode:126BSC02MATOEC01T**	**Credits**	03
Sem.	I	**CourseTitle:**Mathematics–I	**Hours**	42

Course Pre-requisites,if any	NA	
FormativeAssessment Marks:40	SummativeAssessment Marks:60	DurationofESA:.02hrs.

Course Outcomes	Thiscoursewillenablethestudentsto • Learntosolvesystemoflinear equations. • Solve the system of homogeneous and non-homogeneous m linear equationsbyusingtheconceptofrankofmatrix,findingeigenvaluesand eigen vectors. • Students will be familiar with the techniques of differentiation of function with real variables. • Identify and apply the intermediate value theorems and L' Hospital rule. • Learntotracesomestandardcurves.

UnitNo.	**CourseContent**	**Hours**
UnitI	**Matrices:** Recapitulation of Symmetric and Skew Symmetricmatrices,Cayley-Hamiltontheorem,inverse of matrices by Cayley-Hamilton theorem (Without Proof).AlgebraofMatrices;Rowandcolumnreduction, Echelon form. Rank of a matrix; Inverse ofa matrix by elementary operations; Solution of system of linear equations; Criteria for existenceofnon-trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system oflinear equations. Eigen values and Eigen vectors of square matrices, real symmetric matrices and their properties, reduction of such matrices to diagonal form.	14
UnitII	**Differential Calculus:** Limits, Continuity, Differentiability and properties. Intermediate value theorem, Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean value theorem and examples. Taylor's theorem, Maclaurin's series, Indeterminate forms and examples.	14
UnitIII	**Successive Differentiation**: nth Derivatives of Standard functions $□^{ax+b}$,$(□□+□)^{m}$,log(□□+□),sin(□□+□),cos(□□+□), $□^{ax}$sin(□□+ □) , $□^{ax}$cos(□□+□), Leibnitz theorem and its applications.Tracingofcurves(standardcurves)	14
RecommendedLeaningResources		

Print Resources	**References:** 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:ForStudentsofotherthan ScienceStream

Year	I	**CourseCode:126BSC02MATOEC02T**	**Credits**	03
Sem.	I	**CourseTitle:**BusinessMathematics–I	**Hours**	42

CoursePre-requisites,if any	NA	
FormativeAssessment Marks: 40	SummativeAssessmentMarks:60	DurationofESA:.02hrs.

Course Outcomes	Thiscoursewillenablethestudentsto • Translate the real word problems through appropriate mathematical modelling. • Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety ofcontext. • Findingtheextremevaluesoffunctions. • Analyze and demonstrate the mathematical skill require in mathematically intensive areasin economics andbusiness.	
UnitNo.	**CourseContent**	**Hours**
UnitI	**Algebra**–SettheoryandsimpleapplicationsofVenn Diagram, relations, functions, indices, logarithms, permutationsandcombinations.Exampleson commercialmathematics.	14
UnitII	**Matrices**: Definition of a matrix; types of matrices; algebra of matrices. Properties of determinants;calculations of values of determinants upto third order; Adjoint of a matrix, elementaryrowandcolumnoperations;solutionofa systemoflinearequationshavinguniquesolutionand involvingnotmorethanthreevariables. Examplesoncommercialmathematics.	14
UnitIII	**Differential Calculus**: Constant and variables, 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 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	14
RecommendedLeaningResources		

Print Resources	**References:** 1.BasicMathematics,AllelR.G.A,Macmillan,NewDelhi. 2.MathematicsforEconomics,Dowling,E.T.,Schaum'sSeries, McGraw Hill,London. 3.QuantitativeTechniquesinManagement,Vohra,N.D.,TataMcGraw Hill,NewDelhi.

OPEN-ELECTIVESYLLABUS(IISemester):

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

Year	I	**CourseCode:126BSC02MATOEC03T** **CourseTitle:**Mathematics–II	**Credits**	03
Sem.	II		**Hours**	42
CoursePre-requisites,if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60	DurationofESA:.02hrs.	
Course Outcomes		Thiscoursewillenablethestudentsto • RecognizethemathematicalobjectscalledGroups. • Link the fundamental concepts of groups and symmetries of geometrical objects. • Explain thesignificanceofthenotionsofCosets,normal subgroupsand factor groups. • Understand the conceptofdifferentiation and fundamental theorems in differentiation andvariousrules. • Findtheextremevaluesoffunctionsoftwovariables. • To understand the conceptsof multiple integrals and their applications.		
UnitNo.		**CourseContent**		**Hours**
UnitI		**Groups**: Definition of a group with examples and properties,congruence,problems.Subgroups,centerof 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'stheoremandEuler's function.		14
UnitII		**Partial Derivatives**: Functions of two or more variables-explicit and implicit functions, partial derivatives.Homogeneousfunctions-Euler'stheorem, totalderivatives,differentiationofimplicitand composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables, Maxima-Minimaoffunctionsoftwovariables.		14
UnitIII		**Integral Calculus**: Recapitulationofdefiniteintegrals and its properties. Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definition of 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 underneathasurface ofrevolutionusing		14

	double integral. Triple integral: Definition of triple integralsandevaluation-changeofvariables,volume as triple integral. Differentiation under the integral sign by Leibnitz rule.	
RecommendedLeaningResources		
Print Resources	**References:** 1. Topics in Algebra, IN Herstein, 2nd Edition, Wiley Eastern Ltd., New Delhi. 2. Higheralgebra,Bernard&Child,ArihantPub. 3. ModernAlgebra,SharmaandVasishta,KrishnaPrakashanMandir, Meerut, U.P. 4. ACourseinAbstractAlgebra,VijayKKhannaandSKBhambri,Vikas Publications. 5. DifferentialCalculus,ShantiNarayan,S.Chand&Company,New Delhi. 6. IntegralCalculus, Shanti Narayan andP K Mittal, S. Chand and Co. Pvt. Ltd., 7. Schaum'sOutline Series,Frank Ayresand ElliottMendelson, 5th ed. USA: McGraw Hill., 2008. 8. MathematicalAnalysis,SCMalik,WileyEastern. 9. TextBook ofB.Sc.Mathematics,GKRanganath,SChand& Company.	

B:ForStudentsofotherthan ScienceStream

Year	I	**CourseCode:126BSC02MATOEC04T**	**Credits**	03
Sem.	II	**CourseTitle:**BusinessMathematics–II	**Hours**	42
Course Pre-requisites,if any		NA		
FormativeAssessment Marks: 40		Summative Assessment Marks: 60	DurationofESA:.02hrs.	
Course Outcomes		Thiscoursewillenablethestudentsto • Integrate conceptin international business concept with functioning of global trade. • Evaluatethelegal,socialandeconomicenvironmentofbusiness. • Applydecision-support toolstobusinessdecisionmaking. • Willbeable to applyknowledge ofbusinessconcepts and functions in an integrated manner.		
UnitNo.		**CourseContent**		**Hours**
UnitI		**Commercial Arithmetic**: Interest: Concept of Present value and Future value, Simple interest, Compound interest, Nominal and Effective rate of interest, Examples and Problems Annuity: Ordinary Annuity, Sinking Fund, Annuity due, Present Value and Future Value of Annuity, Equated Monthly Instalments (EMI) by Interest of Reducing Balance and Flat Interest methods, Examples andProblems.		14
UnitII		**Measures of central Tendency and Dispersion**:Frequencydistribution:Raw data, attributes and variables,Classification ofdata, 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 centraltendency, Geometricmean: definition, merits and demerits, Harmonic mean: definition,meritsanddemerits,ChoiceofA.M., G.M.andH.M.Conceptofdispersion,Measures of dispersion: Range, Variance, Standard deviation (SD) for grouped and ungrouped data, combinedSD,Measuresofrelativedispersion: Coefficient of range, coefficient of variation. Examples and problems.		14
UnitIII		**Correlation and regression**: Concept and types of correlation, Scatter diagram,		14

	Interpretationwithrespecttomagnitudeand direction of relationship. Karl Pearson'scoefficient of correlation for ungroupeddata.Spearman'srankcorrelation coefficient. (withtie and without tie) Concept of regression,Linesofregressionforungrouped data,predictionsusinglinesofregression. Regressioncoefficientsandtheirproperties (without proof). Examples and problems.	
RecommendedLeaningResources		
Print Resources	**References:** 1. Practical Business Mathematics, S. A. Bari New Literature Publishing Company New Delhi. 2. MathematicsforCommerce,K.SelvakumarNotionPressChennai 3. BusinessMathematicswithApplications,DineshKhattar&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. MathematicsforEconomicsandFinance:MethodsandModelling, Martin Anthony and Norman, Biggs Cambridge University Press Cambridge 7. Financial Mathematics and its Applications, Ahmad Nazri Wahidudin Ventus Publishing APS Denmark 8. FundamentalsofMathematicalStatistics,GuptaS.C.andKapoor V.K.:,SultanChandandSons,New Delhi. 9. StatisticalMethods,GuptaS.P.:SultanChandandSons,New Delhi. 10. AppliedStatistics,MukhopadhyaParimalNewCentralBook Agency Pvt. Ltd. Calcutta. 11. Fundamentals ofStatistics, GoonA.M.,Gupta,M.K.and Dasgupta, B. World Press Calcutta. 12. FundamentalsofAppliedStatistics,GuptaS.C.andKapoorV. K.:, Sultan Chand and Sons, New Delhi.	

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

BOTANY

FIRSTANDSECONDSEMESTERSYLLABUS

AsperNEP2020andadaptedFromRCUBelagaviApplicable

from the

AcademicYear2023-24

Curricular and CreditsStructureunder ChoiceBased CreditSystem [CBCS] ofBotany Major& One Minor Discipline Scheme for the Three Years/Four Years B.Sc./B.Sc. (Honors)Programme with effect from 2023-24

SEMESTER-I										
Category	**Coursecode**	**Titleofthe Paper**	**Marks**			**Teaching hours/ week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01BOTDSC91T**	Microbial Diversity and technology	40	60	100	4	-	-	4	2
	126BSC01BOTDSC01L	Microbial Diversity and technology	25	25	50	-	-	4	2	4
OEC1	126BSC01BOTOEC01T	Plantsand Human welfare	40	60	100	3		-	3	2

SEMESTER -II										
Category	**Coursecode**	**Titleof the Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams(Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02BOTDSC02T**	Diversityof Non flowering plants	40	60	100	4	-	-	4	2
	126BSC02BOTDSC02L	Diversityof Non flowering plants	25	25	50	-	-	4	2	4
OEC2	126BSC02BOTOEC02T	Bio-fuels	40	60	100	3	-	-	3	2

ASSESSMENTMETHODS

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	**40marks**
1st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2ndInternal Assessment Test for30 marks 1hr after 15weeks .Average of two tests should be considered.	30
Assignment	10
Total	**40**

AssessmentCriteria	**25marks**
1stInternal Assessment Test for 20 marks 1 hr after 8weeks and 2nd Internal Assessment Test for20marks 1 hrafter 15weeks. Average of two tests should be considered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	**25marks**
SemesterEndInternalAssessmentTestfor20 marks2hrs	20
Journal (PracticalRecord)	05
Total	**25**

QuestionPaperPattern:

BAGALKOTUNIVERSITY,JAMKHANDI

BSc(botany)

Sub: Code: MaximumMarks:60

a. AnsweranySixQuestionsfromQuestion1

b. AnsweranyThreeeachQuestionsfromQuestion2,3,4and5

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

COURSE-WISESYLLABUS

SemesterI

<table>
<tr><td>Year</td><td>I</td><td colspan="3" rowspan="2">CourseCode:126BSC01BOTDSC91T
CourseTitle:MicrobialdiversityandTechnology</td><td>Credits</td><td>04</td></tr>
<tr><td>Sem.</td><td>1</td><td>Hours</td><td>52</td></tr>
<tr><td colspan="3">CoursePre-requisites,ifany</td><td colspan="3">NA</td></tr>
<tr><td colspan="3">FormativeAssessmentMarks:40</td><td colspan="2">SummativeAssessmentMarks:60</td><td>DurationofESA:2hrs.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">1. Understandthe fascinatingdiversity, evolution, and significance of microorganisms.

2. Comprehend thesystematic position, structure, physiologyand lifecycles of microbes and their impact on humans and environment.

3. Gain laboratory skills such as microscopy, microbial cultures, staining, identification, preservation ofmicrobes fortheir applications in research and industry</td></tr>
<tr><td>UnitNo.</td><td colspan="4">CourseContent</td><td>Hours</td></tr>
<tr><td>Unit-I</td><td colspan="4">Chapter No. 1: Microbial diversity-Introduction to microbial diversity; Hierarchical organization and positions of microbes in the living world. Whittaker’s five-kingdom system. Distribution of microbes in soil, air, foodand water.Significance of microbial diversity in nature. 5Hours

Chapter No. 2: History and developments of microbiology-Microbiologistsand their contributions (Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Dmitri Iwanowski, Sergius Winogradskyand M W Beijerinck and Paul Ehrlich). 3Hours

ChapterNo. 3: Microscopy-Workingprinciple and applications of light, dark field, phase contrastand electron microscopes (SEM and TEM). Microbiological stains (acidic, basic and special) and Principles of staining. Simple, Gram’s and differential staining. 5Hours</td><td>13</td></tr>
<tr><td>Unit-II</td><td colspan="4">Chapter No. 4: Culture media for Microbes-Natural and synthetic media, Routinemedia - basal media, enriched media, selective media, in dictor media, transport media,and storage media. 3Hours
Chapter No. 5: Sterilization methods-Principle of disinfection, antiseptic, tyndallisation and Pasteurization, Sterilization-Sterilization by dry heat, moist heat, UV light, ionization radiation, filtration. Chemical methods of sterilization-phenol compounds, anionic and cationic detergents. 5Hours
ChapterNo.6.MicrobialGrowth-Microbialgrowthandmeasurement. Nutritional types of Microbes- autotrophs and heterotrophs, phototrophs andchemotrophs;lithotrophs and organ otrophs. 5Hours</td><td>13</td></tr>
</table>

UnitIII	**Chapter No. 7:** Microbial cultures and preservation- Microbial cultures. Pure culture andaxeniccultures,sub culturing,Preservationmethods-overlaying cultures with mineral oils, lyophilisation. Microbial culture. Collections and their importance. A brief account onITCC, MTCC and ATCC.**5Hours** **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 andtypes. **5Hours** **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**	13
UnitIV	**Chapter No. 10: Bacteria-** General characteristics and classification. Archaebacteria and Eubacteria. Ultrastructure of Bacteria; Bacterial growth and nutrition. Reproduction in bacteria- asexual and sexual methods. Studyof *Rhizobium* and its applications. A brief account of Actinomycetes and Cyanobacteria. Mycoplasmas and Phytoplasmas-General characteristics and diseases. Economic importance of Bacteria. **5Hours** **Chapter No. 11: Fungi-**General characteristics and classification. Thallus organization and nutrition in fungi. Reproduction in fungi (asexualandsexual). Heterothallism and parasexuality. Typestudyof*Phytophthora,Rhizopus,,Puccinia,Penicillium***. 5Hours** **ChapterNo. 12:Lichens–** Structure and reproduction. **VAM Fungi** and their significance. **Fungal diseases**-. Black stem rust of wheat; Downy Mildew of Bajra, Grain smut ofSorghum,CitrusCanker, Economic importanceof Fungi. **3Hours**	13

RecommendedLeaningResources

Print Resources	**TextBooks** 1. Ananthnarayan Rand PanikarJCK.1986.Textbookof Microbiology. Orient Longmanltd. NewDelhi. 2. AroraDR.2004.Textbookof Microbiology,CBS,NewDelhi. 3. WilliamCG. 1989.Understanding microbes.A laboratory text BookforMicrobiology.W.H.FreemanandCompany.NewYork. 4. DubeyR Cand Maheshwari DK.2007. Atext bookof Microbiology, S.Chandand Company, NewDelhi. 5. DubeyR Cand Maheshwari DK.2002. A Textbook ofMicrobiology, S.C.Chandand Company,Ltd. Ramnagar, NewDelhi. 6. SharmaR.2006.Text book ofMicrobiology. Mittal Publications. New Delhi.305pp. 7. Sharma PD. 1999. Microbiologyand Plant Pathology. Rastogi publications. Meerut, India 8. VasanthkumariR. 2007. Atext book ofMicrobiology, BIPublicationsPvt.Ltd. New Delhi

	References 1. AlexepoulosCJand Mims CW. 1989. IntroductoryMycology, WileyEastern Ltd., New Delhi. 2. Allas RM.1988.Microbiology: Fundamentals and Applications, Macmillan publishingco. New York. 3. Brook TD, Smith DW and Madigan MT. 1984. Biology of Microorganisms, 4th ed. EaglewoodCliffts .N.J.Prentice-Hall. New Delhi. 4. Burnell JHand Trinci APJ. 1979. Fungalwalls and hyphal growth, Cambridge UniversityPress. Cambridge. 5. MichelJ,PelczarJr.ECandKriegCR.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. SulliaSBandShantharamS.1998.GeneralMicrobiology. OxfordandIBHpublishingCo.P.Ltd.NewDelhi

Year	I	CourseCode:126BSC01BOTDSC01L	Credits	02
Sem.	I	CourseTitle:MicrobialdiversityandTechnology	Hours	45

CoursePre-requisites,ifany:	NA	
FormativeAssessmentMarks:25	SummativeAssessmentMarks:25	DurationofESA:03hrs.

Practical 1: Safety measures in microbiology laboratory and study of equipment/appliances used for microbiological studies (Microscopes, Hot air oven, Autoclave/Pressure Cooker, Inoculation needles/loop, Petri plates, Incubator, Laminar flow hood, Colony counter, Haemocytomer, Micrometer etc.).

Practical2: Enumerationofsoil/food/seedmicroorganismsbyserialdilutiontechnique.

Practical 3: Preparation of culturemedia (NA/PDA) sterilization, inoculation, incubation of E coli / B. subtilis/ Fungi and studyof cultural characteristics.

Practical4: DeterminationofcellcountbyusingHemocytometeranddeterminationofmicrobial cell dimension by using Micrometer.

Practical 6: Simple staining of bacteria (Crystalviolet /Nigrosine blue) / Gram's staining ofbacteria.

Practical7: IsolationandstudyofmorphologyofRhizobiumfromrootnodulesoflegumes

Practical8: Preparationofspawnandcultivationofpaddystraw(Oyster)mushroom.

Practical 9: Study of vegetative structures and reproductive structures - Albugo,Phytophthora/Pythium, Rhizopus/Mucor, Saccharomyces, , Puccinia, Agaricus, Lycoperdon, Aspergillus/Penicillium.

Practical 10: Preparation of agar slants, inoculation, incubation, pure culturing andpreservation of microbes by oil overlaying.

Practical11: DownymildewofBajra/Maize/Sorghum,Citruscanker,Tobaccomosaic disease.

Practical 12: Study of well-known microbiologists and their contributions through charts and photographs.

Practical-13: Visit to water purification units/Composting/ microbiology labs/dairy and farmsto understand role of microbes in day today life.

	(Note:Visit toComposting/ microbiologylabs/dairyand farms to understand roleof microbes in day today life and submission of studyreport is compulsory)

Note:Studenthastoexecuteaminimumof10programsineachparttocompletetheLabcourse

EvaluationSchemeforLabExamination

Assessment Criteria		Marks
Preparation	Gramstaining	05
Enumeration		05
Identification		05
Comment		05
VivaVoice/Tourreport		05
Total		**25**

OPEN-ELECTIVESYLLABUS:

Year	I	**CourseCode:**126BSC01BOTOEC01T **CourseTitle:PLANTSANDHUMANWELFARE**	**Credits**	03
Sem.	II		**Hours**	40

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:.02hrs.

Course Outcomes	Attheendofthecourse thestudentshouldbeableto: 1. To make the students familiar with economic importance of diverse plants thatoffer resourcesto human life. 2. Tomakethestudentsknownabouttheplantsusedas-food,medicinalvalue andalsoplantsource of different economic value. 3. To generate interest amongst the students on plants importance in daytodaylife, conservation,ecosystem and sustainability.	
UnitNo.	**CourseContent**	**Hours**
UnitI	Origin of Cultivated Plants. Concept of Centres of Origin, theirimportance with reference to Vavilov's work. Examples of major plant introductions. Crop domestication and loss of genetic diversity (Only conventional plant breeding methods). Importance of plant bio- diversity and conservation. **Cereals**:WheatandRice(origin,evolution,morphology,post-harvest	10

	processing & uses).Green revolution. Brief account of millets and theirnutritional importance.	
UnitII	**Legumes:** General account (including chief pulses grown in Karnataka- red 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
UnitIII	**Spices:** Listingof important spices, their familyand parts used, economic importance with special reference to Karnataka. Study of fennel, clove, black pepper and cardamom. **Fruits:**Mango,grapesandCitrus(Origin,morphology,cultivation ,processinganduses)	10
Unit IV	**Oils and fats:** General description, classification, extraction, their usesand 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
RecommendedLeaningResources		
Print Resources	**TextBooks:** 1. Kochhar, S.L. (2012).Economic Botanyin Tropics. MacMillan & Co. New Delhi. 2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. The Netherlands:Kluwer Academic Publishers. Netherland. 3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agriculture. Jones & Bartlett- Publishers.Lincoln, United Kingdom	

Semester:II

Coursecode:126BSC02BOTDSC02L	Title:DiversityofNonfloweringPlants	
ativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:03

se om es

Aftercompletingthiscoursesatisfactorily,astudentwillbeableto:

1. Understandthediversityandaffinitiesamong Algae, Bryophytes, Pteridophytes and Gymnosperms.
2. Understand the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes, Pteridophytes and Gymnosperms, and their ecological and evolutionary significance.
3. Obtainlaboratoryskills/explorenon-floweringplantsfortheircommercialapplications.

No.	CourseContent	Ho
I	**Chapter No. 1** Algae –Introduction and historical development in algology. General characteristics and classification of algae, Diversity- habitat, thallus organization, pigments, reservefood, flagella types, life-cycleandalternationofgenerationinAlgae.DistributionofAlgae. **5Hours** **Chapter No. 2** Morphology and reproduction and life-cycles of Nostoc, *Oedogonium, Spirogyra, Ectocarpus and Batrachospermum.* Diatoms and their importance. Blue-green algae-A general account. Algal blooms and toxins. **5Hours** **Chapter No. 3** Algal cultivation-Cultivation ofmicroalgae-*Spirulina*;Algal cultivation methods in India. Algal products- Food and Nutraceuticals, Feed stocks, food colorants; fertilizers, aquaculture feed; therapeutics and cosmetics; medicines; dietary fibres from algae and uses. **3Hours**	13
II	**Chapter No. 4.** Bryophytes – General characteristics and classification of Bryophytes, Diversity-habitat, thallus structure, Gametophytes and sporophytes. **5 Hours** **ChapterNo.5**Distribution,morphology,anatomy,reproductionandlife-cyclesof*Riccia, Anthoceros*,and*Funaria*.EcologicalandeconomicimportanceofBryophytes.FossilBryophytes. **3Hours** **ChapterNo.6..Pteridophytes**-General characteristicsand classification;Structureofsporophytes and life-cycles. Distribution, morphology, anatomy, reproduction and life-cycles in Psilotum,*Selaginella*, *Equisetum, Pteris*. **5Hours**	13

III	**ChapterNo.7**Abriefaccountofheterosporyandseedhabit.StelarevolutioninPteridophytes. Affinities and evolutionary significance of Pteridophytes. Ecological and economic importance. **5Hours** **ChapterNo.8.Gymnosperms**-Generalcharacteristics.Distributionand classificationof Gymnosperms. Studyof the habitat, distribution, habit, anatomy, reproduction and life-cycles in Cycas, Pinus andGnetum. **5 Hours** **ChapterNo.9.**AffinitiesandevolutionarysignificanceofGymnosperms.Economicimportanceof Gymnosperms - food, timber, industrial uses and medicines. **3 Hours**	13
itIV	**Chapter No. 10.Originandevolutionof Plants:**Originand evolutionof plantsthrough Geological Time scale. **2 Hours** **ChapterNo.11.Paleobotany**-Paleobotanicalrecords,plantfossils,Preservationofplantfossils- impressions, compressions, petrification's, moulds and casts, pith casts. Radiocarbon dating. **6Hours** **ChapterNo.12.**Fossiltaxa-*Rhynia,Lepidodendron,Lyginopteri* Explorationoffossilfuels.BirbalSahni Institute of Paleosciences. 5 Hours	13

RecommendedLeaning Resources

TextBooks:

Reference:

TextBooks

1) Chopra,G.L.AtextbookofAlgae.Rastogi&Co.,Meerut,Co.,NewDelhi,Depot. Allahabad.

2) Johri,LataanfTyagi,2012,ATextBookof,VedameBooks,NewDelhi.

3) Sharma, O.P.1990.TextBookofPteridophyta.McMillanIndiaLtd.NewDelhi.

4) Sharma,O.P.1992.TextBookof Thallophytes.McGraw HillPublishingCo.NewDelhi.

5)Sharma,O.P.,2017,AlgaeSingh-Pande-Jain2004-05. ATextBook ofBotany. RastogiPublication,Meerut.

References

1.Sambamurty,A.V.S.S..ATextBookofAlgae.I.K.International PrivateLtd.,New Delhi.

2. Agashe,S.N. 1995.Paleobotany.Plants of the past, their evolution, paleoenvironment and Allieplants. Hutchinson & Co., Ltd., London.
3. AndersonR.A.2005,AlgalculturalTechniques,Elsievier,London.

4. Publication, Applicationinexplorationoffossilfuels.Oxford&IBH.,NewDelhi.

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.StructureandreproductionofAlgae.CambridgeUniversityPress.
7. GoffinetBandShawA.J. 2009,BryophyteBiology,2nded.CambridgeUnver

Cambridge.Gymnosperms.
8. Srivastava,HN,2003.AlgaePradeepPublication,Jalandhar,India.

9. Kakkar, R.K. and B.R.Kakkar(1995) The Gymnosperms (Fossils and Living) Central Publishing Hou Allahabad.
10. KumarH.D.,1999,IntroductoryPhycology,AffiliatedEast-WestPress,Delhi.

11. Lee, R.E., 2008, Phycology, Cambridge Unversity Press, Cambridge. 4th edition.McGraw Hill Publis Co., New Delhi.
12. Parihar, N.S.1970. AnIntroductiontoEmbryophyta.Vol.I.Bryophyta.CentralBook,Allhabad.
13. Parihar,N.S.(1976)AnIntroductiontoPteridophytes,CentralBookDepot,Allhabad.
14. Parihar, N.S. 1977. TheMorphology of Pteridophytes. Central Book Depot.,Allahabad.Press, Cambridge.
15. Rashid,A. 1998.AnIntroduction toPteridophyta. IIed.,VikasPublishingHouse,NewD
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.IAlgae&Fungi.TataMcGrawHillPublishing.NewDel

18. Sporne,K.R.1965.TheMorphologyofGymnosperms.Hutchinson&Co.,Ltd.,London.

19. Stewart, W.M. 1983. Paleobotanyand the Evolution of Plants, Cambridge

UniversityCambridge.

I	**CourseCode:126BSC02BOTDSC02L**		**Credits**	**02**
2	**CourseTitle:DiversityofNonfloweringplants**		**Hours**	**45**
sePre-requisites,ifany:	**NA**			
ativeAssessmentMarks:25	**SummativeAssessmentMarks:25**	**DurationofESA:03hrs.**		

Practical-1: Studyof morphology,classification,reproduction and lifecycle of Nostoc, Oscillatoria.

Practical-2: Studyof morphology, classification, reproduction and life-cycle of Oedogonium& Spirogyra, Ectocarpus and Batrachospermum.

Practical-3: Studyof morphology,classification,reproduction and life-cycle of Riccia&Anthoceros/ Funaria.

Practical-4: Studyof morphology, classification, anatomy, reproduction and life-cycle of Selaginella and Equisetum.

Practical -5: Studyof morphology, classification, anatomy, reproduction and life-cycle of Pteris, Azolla/.Psilotum

	Practical -6: Study of morphology, classification, anatomy and reproduction in Cycas. Practical -7: Study of morphology, classification & anatomy, reproduction in Pinus. Practical -8: Studyof morphology, classification & anatomy, reproduction in Gnetum. **Practical-9**:Studyofimportantbluegreenalgaecausingwaterbloomsinthelakes. **Practical-10**:Preparationofnatural mediaandcultivationofAzollainartificialponds. **Practical-11:**Studydifferentalgalproductsandfossilsimpressionsandslides. **Practical-12:**Visit to algal cultivation units/lakes with algal blooms/Fern house/ Nurseries/Geologymuseum/labtostudyplantfossils. (Note: Botanicalstudytourtoafloristicrichareafor1-2daysandsubmissionofstudyreportiscompulsory)

EvaluationSchemeforLabExamination

Assessment Criteria		Marks
Classificationand description		10
T.S.ofgivenmaterial		05
Identification		05
VivaVoice/Tourreport		05
Total		**25**

OPEN-ELECTIVESYLLABUS:

Year	I	**CourseCode:**126BSCO2BOTOEC02T	**Credits**	03
Sem.	II	**CourseTitle:**Bio-fuels	**Hours**	40
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60	DurationofESA:.02hrs.	
Course Outcomes		Attheendofthecourse thestudentshouldbeableto: 1. To make the students familiar with Bio-fuel plant species cultivation for commercial exploitation. 2. To make the studentsknown about the Bio-fuel used in automobileindustries and solving fuel problems in feature. 3. To generate interest amongst the students to know the importance of Bio-fuel inday todaylife and economic wellbeing. 1.		

UnitNo.	CourseContent	Hours
UnitI	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 generationofbiofuels and present status.	10
UnitII	Biofuel feed stocks: Agricultural waste, farm waste, forestry waste, organicwastes from the residential, institutional and industrial waste and its importance.(Biomass- plant, animal and microbial based waste).Algal biofuel.	10
UnitIII	Biodiesel species: *Pongamia pinnata, Simarouba gluca, Jatropha curcas, Azardirachta india, Madhucaindica* and *Callophyllum innophyllum* .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).Qualityanalysis of biodiesel, bioethanol and biogas and its comparison with national and international standards. Biofuel sustainability; Biofuel PolicyinKarnatakaandIndia.Biofuelproduction statistics.Fuel against food securityconcepts.	10
RecommendedLeaningResources		
Print Resources	**TextBooksandReferences** 1) TheBiodiesel Handbook (2005). Jurgen Krahl, Jon Harlan Van Gerpen.AOCS Press. 2) Bioenergyand Biofuels (2017).Ozcan Konur. CRC Press, Taylor & Franci's group. 3) https://mnre.gov.in/biofuels 1.	

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

ZOOLOGY

FIRSTAND SECONDSEMESTERSYLLABUS

AsperNEP2020andadaptedFromRCUBelagaviapplicablefromthe

AcademicYear2023-24

Zoology

Credits StructureunderChoice Based Credit System [CBCS] ZoologyMajor& OneMinor Discipline Scheme for the Threeyears/ Four Years B.Sc./B.Sc.(Honors) Programwith effect from2023-24.

SEMESTER-I										
Category	**Coursecode**	**Title of thePaper**	**Marks**			**Teaching hours/week**			**Credits**	**Durationof exams(Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01ZOODSC91T**	Cytology, Geneticsand Infectious Diseases	40	60	100	4	-	-	4	2
	126BSC02ZOODSC01L	CellBiology andGenetics	25	25	50	-	-	4	2	4
OEC1	126BSC01ZOOOEC01T	Economic Zoology	40	60	100	3	-	-	3	2

SEMESTER-II										
Category	**Coursecode**	**Titleofthe Paper**	**Marks**			**Teaching hours/week**			**Credits**	**Duration of exams(Hrs.)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02ZOODSC02T**	Biochemistryand Physiology	40	60	100	4	-	-	4	2
	126BSC02ZOODSC02L	Physiological, Biochemical& Hematology	25	25	50	-	-	4	2	4
OEC2	126BSC02ZOOOEC02T	Parasitology	40	60	100	3	-	-	3	2

SyllabusforISemester

Year	I	CourseCode:126BSC01ZOODSC91T	Credits	04
Sem.	1	CourseTitle:Cytology,GeneticsandInfectiousDiseases	Hours	56

UnitNo.	CourseContent	Hours
UnitI	**StructureandFunction ofCellOrganellesI inAnimalcell** • Plasmamembrane:chemicalstructure—lipidsandproteins • Endomembranesystem: protein targetingand sorting, transport,endocytosisandexocytosis **StructureandFunctionofCell OrganellesIIinAnimalCell** • Cytoskeleton: microtubules, microfilaments, intermediate filaments • Mitochondria:Structure, oxidative phosphorylation; electron transport system PeroxisomeandRibosome: structureandfunction	14
UnitII	**NucleusandChromatinStructure** • Structureand functionofnucleusineukaryotes • Chemicalstructureand base compositionofDNA and RNA • Structureofchromosomes • TypesofDNAandRNA **Cellcycle,CellDivisionandCellSignaling** • Celldivision:mitosisandmeiosis • IntroductiontoCellcycleanditsregulation, apoptosis • Signaltransduction:intracellular11 signalingand cell surface receptors, via G-protein linked receptors • Cell-cellinteraction:celladhesionmolecules,cellular junctions	14
UnitIII	**MendelismandSexDetermination** • Basicprinciples of heredity: Mendel ‘s laws-monohybrid cross and hybrid cross • CompleteandIncompleteDominance • Genetic Sex-DeterminingSystems, Environmental Sex Determination, Sex Determination and mechanism in *Drosophila melanogaster.* • Sex-linkedcharacteristics in humansand dosage compensation **ExtensionsofMendelism,GenesandEnvironment** • Extensionsof Mendelism: Multiple Alleles, Gene Interaction. • The InteractionBetweenSex and Heredity:Sex-Influenced and Sex-Limited Characteristics • CytoplasmicInheritance,GeneticMaternalEffects. • Interaction between Genes and Environment: Environmental Effect on Gene Expression, Inheritance of Continuous Characteristics.	14

UnitIV	**HumanChromosomesandPatternsofInheritance** • Patterns of inheritance: autosomal dominance, autosomal recessive, X-linked recessive, X-linked dominant. • Chromosomalanomalies:Structural and numerical aberrations with examples. • Humankaryotyping. **InfectiousDiseases** • Introductionto pathogenicorganisms: viruses, bacteria, fungi, protozoa and worms. • Structure, lifecycle, pathogenicity, including diseases, causes, symptoms and control of common parasites: *Trypanosoma, Giardiaand Wuchereria*	14

References:

1. Lodishetal:MolecularCellBiology:Freeman&Co,USA(2004).
2. Albertsetal:MolecularBiologyoftheCell:Garland(2002).
3. Cooper:Cell:AMolecular Approach:ASMPress(2000).
4. Karp:CellandMolecularBiology:Wiley(2002).PierceB.Genetics.Freeman(2004).
5. LewinB.Genes VIII.Pearson (2004).
6. Watsonetal.Molecular BiologyoftheGene.Pearson(2004).
7. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby-Kuby Immunology.W H Freeman (2007).
8. DelvesPeter J.,MartinSeamusJ., BurtonDennis R., Roitt Ivan M. Roitt's EssentialImmunology, 13thEdition. Wiley Blackwell (2017).
9. PrinciplesofGeneticsbyB.D.Singh
10. Cell-BiologybyC.B.Pawar,KalyaniPublications
11. EconomicZoologybyShuklaandUpadhyaya

Pedagogy:WrittenAssignment/Presentation/Project/TermPapers/Seminar

Formative Assessment	
AssessmentOccasion	Weightagein Marks
HouseExamination/Test	10
Written Assignment/Presentation/Project / Term Papers/Seminar	15
Classperformance/Participation	05
Tota l	30

Zoology-LabCourseContent

Semester-I

CourseTitle:CellBiology&Cytogenetics	CourseCredits:**2**
CourseCode**:126BSC02ZOODSC01L**	L-T-Pperweek:0-0-4
TotalContactHours**:56**	DurationofESA:4Hours
FormativeAssessmentMarks:**15**	Summative AssessmentMarks:**35**

CourseOutcomes(COs):

Attheendofthecoursethestudentshouldbeableto:

1. Tousesimpleandcompoundmicroscopes.
2. Topreparestainedslidestoobservethecellorganelles.
3. To be familiar with the basic principle of life, how a cell divides leadingto the growth of anorganism and also reproduces to form new organisms.
4. Thechromosomalaberrationsbypreparingkaryotypes.
5. Howchromosomal aberrations are inherited in humans bypedigree analysis in familiesTheantigen-antibodyreaction

LabCourseContent

ListofLabs	**56hrs**
1. Understandingofsimpleandcompoundmicroscopes. 2. To study different cell types such as buccal epithelial cells, neurons, striated muscle cells usingMethylene blue/anysuitable stain (virtual/ slaughtered tissue). 3. To studythe different stages of Mitosis in root tip of Allium cepa. 4. To studythe different stages of Meiosis in grasshopper testis (virtual). 5. To check the permeabilityof cells usingsalt solution ofdifferent 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. Lodishetal:MolecularCellBiology:Freeman&Co,USA(2004).
2. Albertsetal:MolecularBiologyoftheCell:Garland(2002).
3. Cooper:Cell:AMolecular Approach:ASMPress(2000).
4. Karp:CellandMolecularBiology:Wiley(2002).PierceB.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.HeritagePublishers, NewDelhi.

Pedagogy:PracticalExaminationformat

Question	Content	Marks
I	Preparation	05
II	Karyotype	06
III	Identification	14
IV	Vivo	05
V	RecordBook	05
	Total	35

OPEN-ELECTIVESYLLABUS

Year	I	Course Code:126BSC01ZOOOEC01T	Credits	03
Sem.	1	CourseTitle:EconomicZoology	Hours	42

Unit No.	CourseContent	Hours
UnitI	**1. Sericulture:** • HistoryandpresentstatusofsericultureinIndia • MulberryandnonmulberryspeciesinKarnatakaandIndia • Mulberrycultivation • Morphologyandlifecycleof*Bombyxmori* • Silkworm rearingtechniques:Processingofcocoon,reeling • Silkwormdiseasesandpestcontrol **2. Apiculture:** • Introduction andpresentstatusofapiculture • SpeciesofhoneybeesinIndia,lifecycleof*Apisindica* • Colonyorganization, division of labor and communication • Bee keeping as an agro based industry; methods and equipments: indigenous methods, extraction appliances, extraction of honeyfrom the comb and processing • Beepasturage, honeyand beeswax and theiruses Pests and diseases of bees and their management	14
UnitII	**3. LiveStockManagement:** **Dairy:** • Introductionto commondairyanimals and techniques of dairymanagement • Types, loose housing system and conventional barn system; advantages and limitations of dairyfarming • Establishment of dairyfarm and choosingsuitable dairy animals-cattle • Cattlefeeds,milkandmilk products • Cattlediseases **Poultry:** • Typesof breedsandtheirrearingmethods • Feedformulationsforchicks • Nutritivevalueof eggandmeat • Diseaseof poultryandcontrolmeasures **4. Aquaculture:** • Aquaculturein India: An overviewand 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
UnitIII	**5. Fish culture:** • Commonfishesusedforculture.	14

	• Fishingcraftsandgears. • Ornamental fish culture: Fresh water ornamental fishes-biology, breeding techniques • Constructionand maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater aquaria, aquarium plants, ornamental objects, cleaning the aquarium, maintenance of waterquality. controlof snailand algal growth. • Moderntechniquesoffishseedproduction **6. Prawnculture:** • Cultureoffreshandmarinewaterprawns. • Preparationoffarm. • Preservationandprocessingofprawn,exportofprawn. **7. Vermiculture:** • Scopeofvermiculture. • Typesofearthworms. • 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. • Advantagesofvermicomposting. • Diseases andpestsofearthworms. **8. LacCulture:** • Historyoflacanditsorganization,lacproductioninIndia. • Lifecycle,hostplantsand strainsoflac insect. • Lac cultivation: Local practice, improved practice, propagation of lacinsect, inoculation period, harvesting of lac. Lac composition, processing, products, uses.	

TextBooks:Suggested Readings:

1. Eikichi, H. (1999). Silkworm Breeding(Translatedfrom Japanese). Oxford & IBH Publishing Co.Pvt. Ltd., New Delhi.
2. Ganga, G. (2003). ComprehensiveSericulture Vol-II: Silkworm Rearingand Silk Reeling.
3. Oxford&IBHPublishingCo.Pvt.Ltd.,NewDelhi.
4. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad,R., (2000). MulberrySilk
5. ReelingTechnologyOxford&IBHPublishingCo.Pvt.Ltd.,NewDelhi.
6. Roger,M (1990).TheABC and Xyz of Bee Culture: An Encyclopediaof Beekeeping, KindleEdition.

7. ShuklaandUpadhyaya(2002).EconomicZoology,RastogiPublishers
8. YadavManju(2003).Economic Zoology,DiscoveryPublishingHouse.
9. JabdePradipV (2005). Textbook of applied Zoology, DiscoveryPublishing House, New Delhi.
10. Cherian &RamachandranBeekeepingin-SouthIndianGovt.Press,Madras.
11. Sathe,T.V.Vermiculture andOrganicfarming.
12. Bard.J(1986).HandbookofTropicalAquaculture.
13. Santhanam,R.A.Manualof Aquaculture.
14. Zuka.R.1andHamiyn(1971).Aquariumfishesandplants
15. Jabde,P.V. (2005)TextBookof Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac culture.
16. AnimalDisease-BairagiK.N.AnmolPublicationsPvt.Ltd2014
17. EconomicsofAquaculture-Singh(R.K.P)-DanikaPublishingCompany2003
18. Applied and Economic Zoology (SWAYAM) web https://swayam.gov.in/nd2_cec20_ge23/previewCourse Books published in Englishand Kannada may be prescribed bythe Universities and College

Pedagogy: ChalkandTalk,PPT,Groupdiscussion,Seminar,Fieldvisit

Semester:II

Year	I	CourseCode:126BSC02ZOODSC02T	Credits	04
Sem.	2	CourseTitle:BiochemistryandPhysiology	Hours	56

UnitNo.	CourseContent	Hours
UnitI	**StructureandFunction ofBiomolecules:** • Structure and Biological importance of carbohydrates (Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates). • Lipids (saturated and unsaturated Fatty acids, Tri-acylglycerols, Phospho lipids, Glycolipids and Steroids) **Structure, Classificationand General Properties of*α*-amino acids;** Essential and non-essential amino acids, Levels of organization in proteins; Simple and conjugate proteins. **EnzymeActionandRegulation** • Nomenclature andclassification ofenzymes; Cofactors; Specificity of enzyme action. • Isozymes;Mechanismofenzymeaction • Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Equation of Michaela's -Mendon, Concept of Km and V max, Enzyme inhibition • Allostericenzymesandtheirkinetics;Regulationof • enzymeaction.	14
UnitII	**MetabolismofCarbohydratesandLipids** • 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 acidswith even and odd number of carbon atoms **MetabolismofProteinsandNucleotides** • **Catabolismof amino acids:** Transamination, Deamination, Urea cycle, Nucleotides, and vitamins Peptide linkages	14

UnitIII	**DigestionandRespirationin humans** • Structural organization and functions of gastrointestinaltractand associated glands. • Mechanical and chemical digestion of food; Absorptionsof carbohydrates, lipids, proteins, water, minerals and vitamins; Physiology of trachea and Lung. • Mechanismofrespiration,Pulmonary ventilation; Respiratoryvolumes and capacities; Transport of oxygen and carbon dioxide in blood, Respiratory pigments, Dissociation curves and the factors influencingit. **CirculationandExcretioninhumans** • Componentsofbloodandtheirfunctions;hemopoiesis • Blood clotting: Blood clotting system, Blood groups: Rh-factor, ABO and MN • Structure ofmammalianheart • Cardiaccycle; Cardiacoutput andits regulation, Electrocardiogram, Blood pressure and its regulation **Structure of kidney anditsfunctionalunit;**Mechanism of urineformation	14
UnitIV	**NervousSystemandEndocrinologyinhumans** • Structureofneuron,restingmembranepotential(RMP) • Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers. Types of synapse **Endocrineglands**-pineal,pituitary,thyroid,parathyroid, pancreasandadrenalgland **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.	14

SuggestedReadings

1. Nelson &Cox:Leininger‘sPrinciplesofBiochemistry:McMillan(2000)
2. Zubayetal:PrinciplesofBiochemistry:WCB (1995)
3. Voet&Voet:BiochemistryVolsl&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 HumanPhysiology Volume l & 2,11th edition, CBS Publishers (20I6).

SemesterII:ZoologyCourseLabContent

Course Title/Code: Biochemistry andPhysiology	CourseCredits:**2**
CourseCode:**126BSC02ZOODSC02L**	L-T-P per week:0-0-4
TotalContactHours**:56**	Duration ofESA:4Hours
FormativeAssessmentMarks:**15**	SummativeAssessmentMarks:**35**

CourseOutcomes(COs):

- At theend of the coursethe student should beable to understand: Basicstructureof biomolecules through model making.
- Developtheskills toidentifydifferenttypesof bloodcells.
- Enhance basiclaboratoryskill likekeen observation, analysis and discussion. Learnthe functional attributes of biomolecules in animal body.
- Knowuniqueness ofenzymes in animal bodyand theirimportancethrough enzyme kinetics.

LabCourseContent

Listoflabstobe conducted	**Hours**
1. Preparationofmodelsofnitrogenousbases-nucleosidesandnucleotides. 2. Preparationofmodelsofaminoacidsanddipeptides. 3. Preparationofmodelsof DNAandRNA. 4. QualitativeanalysisofCarbohydrates,ProteinsandLipids. 5. Qualitativeanalysis of Nitrogenous wastes –Ammonia, Urea and Uric acid. 6. Separationofaminoacidsorproteinsbypaperchromatography.	20
7. Determination of the activityof enzyme (Urease)-Effect of [S] and determination of -Km and Vmax. 8. Determination oftheactivityof enzyme (Urease) - Effect of temperature and time.	15

10. Estimation of Hemoglobin in human blood using Sahli'shaemoglobinometer. 11. CountingofRBCinbloodusingHemocytometer. 12. CountingofWBCinbloodusingHemocytometer. 13. DifferentialstainingofhumanbloodcorpusclesusingLeishmanstain. 14. Recordingofbloodglucoselevelbyusingglucometer.	15
Virtual Labs (Suggestive sites) https://www.vlab.co.inhttps://zoologysan.blogspot.com www.vlab.iitb.ac.in/vlabhttps://vlab.amrita.edu https://sites.dartmouth.eduwww.onlinelabs.in	06

TextBooks

1. Nelson&Cox:Lehininger'sPrinciplesofBiochemistry:McMillan(2000)
2. Zubayetal:PrinciplesofBiochemistry:WCB(1995)
3. Voet&Voet:BiochemistryVolsl&2:Wiley(2004)
4. Murray et al: Harper's Illustrated Biochemistry: McGraw Hill (2003) Elliott and Elliott: Biochemistry and Molecular Biology: Oxford UniversityPress
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. XIEditionJohn 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. ChatterjeeCCHumanPhysiologyVolumel&2,11thedition,CBSPublishers(20I6).

WebReferences: MammalianPhysiology–www.biopac.com

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

TOPICSRECOMMENDEDFORSEMINAR/PROJECTREPORT

1. Biochemicalpathways,theirevolutionarybackgroundandregulation.
2. Bloodgroups andtheirimportance.
3. Vitalenzymesforhumanbody.
4. Essentialandnonessentialaminoacids.
5. Importantbodylipids.
6. Significanceofanimalproteins.
7. Roleof carbohydratesinanimalbody.
8. Natureofproteinsandnurtureofanimalbody.
9. Roleoflipidsinstructuralandfunctionalorganizationof body.

Pedagogy:PracticalExaminationformat

Question	Content	Marks
I	Qualitativetest/Separation	09
II	Quantitativetest/Differentialcount	09
III	Estimation/Counting	09
IV	Vivo	03
V	RecordBook	05
	Total	**35**

OPEN-ELECTIVESYLLABUS:

<table>
<tr><td>Year</td><td>I</td><td colspan="2">CourseCode:126BSC02ZOOOEC02T
CourseTitle:Parasitology</td><td>Credits</td><td>03</td></tr>
<tr><td>Sem</td><td>II</td><td colspan="2"></td><td>Hours</td><td>42</td></tr>
<tr><td colspan="2">UnitNo.</td><td colspan="2">CourseContent</td><td colspan="2">Hours</td></tr>
<tr><td colspan="2">UnitI</td><td colspan="2">1. GeneralConcepts
• Introduction,Parasites,parasitoids,host,zoonosis
• Originand evolutionofparasites
• Basic concept of Parasitism, symbiosis,phoresis, commensalisms and mutualism
• Host-parasiteinteractions andadaptations
• Lifecycleofhumanparasites
• Occurrence,modeof infectionand prophylaxis
2. ParasiticPlatyhelminthes
Studyof morphology, life cycle, pathogenicity, prophylaxis and control measures of
• Fasciolopsisbuski
• Schistosomahaematobium
• Taeniasolium
• Hymenolepisnana
3. ParasiticProtists
Studyof morphology, life cycle, pathogenicity, prophylaxis and control measures of
• Entamoebahistolytica
• Giardiaintestinalis
• Trypanosomagambiense
Plasmodiumvivax</td><td colspan="2">14</td></tr>
<tr><td colspan="2">UnitII</td><td colspan="2">4. ParasiticNematodes
Studyof morphology, life cycle, pathogenicity, prophylaxis andcontrol measures of
• Ascarislumbricoides
• Ancylostomaduodenale
• Wuchereriabancrofti
• Trichinellaspiralis
• Nematodeplant interaction;Gallformation
5. Parasitic Arthropods
Biology,Importanceandcontrolof
• Ticks(Soft tickOrnithodoros,Hard tickIxodes)
• Mites(Sarcoptes)
• Lice(Pediculus)
• Flea (Xenopsylla)
• Bug(Cimex)
• Parasitoid (Beetles)
6. ParasiticVertebrates
• CookiecutterShark
• HoodMockingbirdand Vampire bat and their parasitic behavior and effect on host</td><td colspan="2">14</td></tr>
</table>

UnitIII	7. **Moleculardiagnosis&clinicalparasitology** • Generalconcept of molecular diagnosis for parasitic infection • Advantagesanddisadvantagesofmoleculardiagnosis • Fundamentaltechniques used in moleculardiagnosis ofendoparasites. • Immunoassay or serological techniques for laboratorydiagnosis 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) ComplementFixationTest (CFT)PCR, DNA,RNAprobe	14

SuggestedReadings:

1. Arora, D. Rand Arora, B.(2001)MedicalParasitology. IIEdition. CBS Publications andDistributors.
2. E.R. Noble and G.A. Noble (1982)Parasitology: The biologyof animal parasites. V Edition,Lea&Febiger.
3. Ahmed, N., Dawson, M., Smith, C. and Wood, Ed. (2007)Biologyof Disease. Taylor andFrancis 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.

5Meyer,Olsen &Schmidt's Essentials ofParasitology, Murray, D. Dailey, W.C. BrownPublishers.

5. K. D. Chatterjee(2009).Parasitology: Protozoologyand Helminthology. XIII Edition, CBSPublishers & Distributors (P) Ltd.
6. Gunn,A.andPitt,S.J.(2012).Parasitology:anIntegratedApproach.WileyBlackwell.
7. Noble,E. R. and G.A.Noble (1982) Parasitology: Thebiologyof animal parasites. V thEdition, Lea &Febiger.
8. Paniker, C.K.J., Ghosh,S. [Ed} (2013). Paniker‘s Text Bookof Medical Parasitology.Jaypee, New Delhi.
9. Parija,S.C.Textbookofmedicalparasitology,protozoology&helminthology(Textand colorAtlas),II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
10. Roberts, L.S and Janovy, J. (2009).Smith& Robert‘sFoundationof 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). Introductionto Parasitology, 10th ed. John Wileyand Sons Inc.
12. Cheng,T.C.(1986).GeneralParasitology.2nded.AcademicPress,Inc.Orlando.U.S.A.
13. Schmidt, G. D. (1989).Essentialsof Parasitology. Wm. C. Brown Publishers (Indianprint1990, Universal Book Stall).
14. JohnHyde(1996)Molecular ParasitologyOpenUniversityPress.

Pedagogy: ChalkandTalk,PPT,Groupdiscussion,Seminar,Interaction,virtuallabvisit.,

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

ELECTRONICS

FIRSTANDSECONDSEMESTERSYLLABUS

As per NEP 2020 and adapted from RCU Belagavi, applicable

from the

AcademicYear2023-24

PROGRAMSTRUCTURE

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

SEMESTER-I										
Category	**Coursecode**	**Titleofthe Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01ELEDSC91T**	Electronic Devicesand Circuits.	40	60	100	4	-	-	4	2
	126BSC01ELEDSC01L	PracticalI	25	25	50	-	-	4	2	4
OEC1	126BSC01ELEOEC01T	Basics of Electronics, Computers and PCB Design	40	60	100	3		-	3	2

SEMESTER-II										
Category	**Coursecode**	**Titleof the Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02ELEDSC02T**	Analogand Digital Electronics	40	60	100	4	-	-	4	2
	126BSC02ELEDSC02L	PracticalII	25	25	50	-	-	4	2	4
OEC2	126BSC02ELEOEC02T	Electronics for Everyone	40	60	100	3	-	-	3	2

COURSE-WISESYLLABUS

SemesterI

Year	I	**CourseCode:126BSC01ELEDSC91T**	**Credits**	**04**
Sem.	1	**CourseTitle:ELECTRONICDEVICESANDCIRCUITS**	**Hours**	**52**

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:2hrs.

Course Outcomes	Attheendofthecoursethestudentshouldbeableto: 1. Attheendofthecoursethestudentshouldbeableto: 2. Studyand analyse basic networks using network theorems in a systematic manner. 3. Buildsimpleelectroniccircuitsusedinvariousapplications. 4. Describethebehaviourofbasicsemiconductordevices 5. ReproducetheI-Vcharacteristicsofdiode/BJTdevices 6. DescribethefrequencyresponseofBJTamplifiers. 7. Explain the behaviour, characteristics and applications of Varactor diode, Schottkydiode, Tunnel diode, LED, LCD and solar cells. 8. Apply standarddevicemodelstoexplain/calculatecriticalinternal parameters of semiconductor devices. 9. Understand and represent numbers in powers of base and converting one from the other, carry out simple arithmetic operations. UnderstandthebasicknowledgeofDigitalsystembuildingblocks,effectively can construct simple digital designs with the knowledge of Boolean algebra.

Unit No.	**CourseContent**	**Hours**
Unit- I	**Electronic Components:** Electronic passive and active components, types and their properties, Concept of Voltage and Current Sources, electric energy and power (Qualitative only). **Network Theorems:** Superposition, Thevenin's, Norton's, Maximum Power Transfer, and ReciprocityTheorems. AC analysis of RC and RLcircuits, RLC series and parallelcircuits, Resonant circuits. **PN junction diode:** Ideal and practical diodes, Formation of Depletion Layer, Diode I-V characteristics. Idea of static and dynamic resistance, Zener diode, Reverse saturation current, Zener and avalanche breakdown. **Rectifiers**-Half wave and Full wave (center tap and bridge) rectifiers, expressions for output voltage, ripple factor and efficiency (mention only), **Filters:**Filtersandtypesoffilters,Capacitorfilter,Seriesinductorfilter, ChockinputorLCfilterandCapacitorinputfilter,Comparisonbetween them (study of wave forms qualitative). (Numerical examples wherever applicable).	**13**
Unit- II	**Voltage regulator:** Concept of voltage regulation, Block diagramof regulated power supply, Line and Load regulation, Zener diode as voltage regulator, advantages and disadvantages. Fixed and Variable IC Voltage Regulators(78xx, 79xx, LM317), Clippers (shunt type) and clampers (Qualitative analysis only), Voltage Multipliers. **Bipolar Junction Transistor:** Construction, types, CE, CB and CC configurations (mention only), V-I characteristics of a transistor in CE mode, Regions of operation (active, cut off and saturation), leakage currents (mention only), Current gains α, β and γ and their inter-relations, dc load line and Qpoint. Applications of transistor as amplifier and switch - circuit and working. (Numerical examples wherever applicable).	**13**

Unit-III	**Transistor biasing and Stabilization circuits**- Fixed Bias and VoltageDivider 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 FrequencyResponse, GBW product. **Special semiconductor diodes: C**onstruction, 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 by1's and 2's complement method, BCD code (8421, 2421, Excess-3), Graycode. **Boolean Algebra:** Basic logic gates-AND, OR, NOT, Positive and negative logic, Boolean laws, Duality Theorem, De Morgan's Theorem, Simplificationof Boolean expressions-SOP and POS. Derived logic gates (NAND, NOR,XOR & XNOR). Universal property of NOR and NAND gates. (Numerical examples wherever applicable).	**13**
RecommendedLeaningResources		
Reference Books	1. VKMehta"PrinciplesofElectronics" 2. NNBhargav"Basic Electronics" 3. ASudhakar "NetworkAnalysis" 4. RSSedha"AppliedElectronics" 5. BrijlalandSubramanayam"ElectricityandMagnetism" 6. Robert L Boylestad, "Introductorycircuit analysis", 5th edition., Universal Book-2003. 7. A.P.Malvino,"PrinciplesofElectronics",7thedition.TMH,2011. 8. Electronicdevicesandcircuittheorybyboylestad,RobertNashelsky. 9. David A. Bell "Electronic Devices and Circuits", 5th Edition, Oxford Uni.Press, 2015 10. ThomasL.Floyd,DigitalFundamentals,PearsonEducationAsia (1994) 11. DigitalCircuitsandsystems,Venugopal,2011,TataMcGrawHill. 12. Digital Systems: Principles & Applications, R.J. Tocci, N.S.Widmer, 2001, PHILearning.	

LaboratoryExperiments:

Year	I	CourseCode:126BSC01ELEDSC01L	Credits	2
Sem.	1	CourseTitle: ElectronicDevicesandCircuits *(HardwareandCircuitSimulationSoftware)*	Hours	4 Hrs/week
FormativeAssessmentMarks:25		SummativeAssessmentMarks:25	Duration ofESA:4hrs.	

Sl.No	Experiment
1	**DemonstrationExperiment:**Familiarizationwith a) Electronic components b) Resistanceinseries,parallelandseries-parallel c) Capacitorsandinductorsin seriesand parallel d) MultimeterandLCRmeter–checkingofcomponents/measurements. e) Voltagesourcesin series,paralleland series-parallel f) Voltageandcurrentdividers g) Measurement of Amplitude, Frequency & Phase difference using oscilloscope.
2	VerificationofThevenin'sTheorem/VerificationofNorton'sTheorem.
3	VerificationofMaximumPowerTransferTheorem.
4	VerificationofSuperpositionTheorem.
5	StudyoftheI-VCharacteristicsofZenerdiode.
6	StudyoftheI-VCharacteristicsofLEDsoftwodifferentcoloursand7-segmentdisplay.
7	Studyof Half wave rectifier without and with shunt capacitor filter– ripple factor for different values of filter capacitors.
8	Studyof full wave bridge rectifier without and with shunt capacitor filter –ripple factor for different values of filter capacitors.
9	StudyofZenerdiodeasaVoltageRegulatorusingbridgerectifierwithshuntcapacitor filter[Loadandlineregulation].
10	StudyofClipping,ClampingandVoltageMultipliercircuits.
11	Designingand testingof fixed positive and negative voltage regulators using78xx and 79xx series ICs (Using bridge rectifier and shunt capacitor filter).
12	Designingandtestingof variable voltage regulator using IC LM317 (Using bridge rectifier and shunt capacitor filter).
13	StudyofTransistorcharacteristicsinCEconfiguration–determinationofh-parameters.
14	StudyofFixedBiasandVoltagedividerbiascircuits–comparisonfordifferentβvalues
15	Studyof single stage CE amplifier (frequencyresponse, input and output impedances in mid-band)
16	Studyoftwo-stageRC-coupledCEamplifier(AV1,AV2,AV)atmid-bandfrequency.
17	StudyofSeriesandParallelResonancecircuits–determinationofits (a) Resonantfrequency (b) Impedanceatresonance (c) Bandwidth (d) QualityFactor
18	Verification oftruth tables ofOR, AND, NOT, NAND, NOR, XOR and XNOR gates using respectiveICs. Realization of XOR and XNOR using basic gates.
19	UniversalpropertyofNANDandNORgates.
20	Binaryto Grayand Grayto Binarycode conversion and paritychecker using XORgates IC 7486

OPEN ELECTIVE

Year	I	**CourseCode:**126BSC01ELEOEC01T	**Credits**	**03**
Sem.	1	**CourseTitle: Basics ofElectronics,ComputersandPCBDesign**	**Hours**	**40**
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60	DurationofESA:2hrs.	

Unit No.	**CourseContent**	**Hours**
Unit- I	**Basics Electronics:** Basiccircuit 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). Outputdevices (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 offline UPS, SMPS.	**10**
Unit- II	**PCB Design:**Types of PCB, Singlesidedboard – double sided – Multilayer boards – Plated through holes technology – Benefits of Surface Mount Technology (SMT) – Limitation of SMT – Surface mount components: Resistors, Capacitor, Inductor, Diode and IC's. **LAYOUT AND ARTWORK:**Layout Planning –General rules ofLayout – Resistance,CapacitanceandInductance–ConductorSpacing–Supply andGroundConductors–ComponentPlacingandmounting–Cooling requirement and package density–Layout check. Basic artwork approaches–Artworktapingguideline–Generalartworkrules–artworkcheckand Inspection.	**10**
Unit-III	**LAMINATES AND PHOTO PRINTING:** Manufacture of copper clad laminates – Propertiesof laminates – Types of Laminates – Manual cleaning process – Basic printing process for double sided PCB's – Photo resists –wet film resists –Coatingprocess for wet film resists – Exposureandfurther process for wet film resists – Dry film resists.	**10**
Unit-IV	**ETCHINGANDSOLDERING:**Introduction–Etchingmachine–Etchantsystem.Soldering:PrinciplesofSolder connection–Solder joints – Solderalloys – Soldering fluxes. **Soldering Tools:** Soldering, Desoldering tools and Techniques – Man Soldering – Solder mask – Safety, health andmedical aspects in Soldering practice.	**10**
Laboratory Demonstration	1. Unboxingandassemblingofdesktopcomputers, 2. TypesofPCBand fabricationprocess.	
RecommendedLeaningResources		

Reference Books	1. Computer fundamentals-AnitaGoel,PearsonEdition. 2. FundamentalsofComputers-VRajaram,NeeharikaAdabala-PHI. 3. ComputerFundamentals-PeterNorton,McGraw-HillEducation 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 andLayout," Elsevier, Amsterdam, 6. Walter C Bosshart, "Printed Circuit Board Design and Technology",1st ed., McGraw Hill Education

SemesterII

Year	I	CourseCode:126BSC02ELEDSC02T	Credits	04
Sem.	1	CourseTitle:ANALOGANDDIGITALELECTRONICS	Hours	52

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:2hrs.

Course Outcomes	Attheendofthecoursethestudentshouldbeableto: 1. ReproducetheI-VcharacteristicsofvariousMOSFETdevices, 2. Explain the behavior andcharacteristicsof power devicessuch asUJT,SCR,Diac, Triac etc. 3. Calculatevariousdeviceparameters'valuesfromtheirVIcharacteristics. 4. ExplainvariousOperationalamplifierparameters 5. ListvariousapplicationsofOperationalamplifier. 6. Explain IC 555 as a timer with applications 7.Understand K-Map and simplifyBoolean expressions 8.Analysecombinatorialandsequentialcircuits

Unit No.	Course Content	Hours
Unit- I	**JFET**: Types - p-channel and n-channel, working and I-V characteristics - n-channel JFET, parameters and their relationships, Comparison of BJT and JFET. **MOSFET:** Enhancement MOSFET, Depletion MOSFET (n-channel and p-channel), Construction, working, symbols, drain and transfer characteristics, VMOS, UMOS Power MOSFETs, handling, MOS logic, symbols and switching action of MOS, NMOS inverter. **UJT:** Basic construction, working, equivalent circuit andI-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).	**13**
Unit- II	**Operational Amplifier:** Qualitative study of Differential Amplifier, 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) negative feedback circuits' derivation of voltage gain inputresistance, output resistance bandwidth and Total output offset voltage, numerical problems. **APPLICATIONS OF OP-AMPLIFIER:** Op-amp adder, Subtractor.Current to Voltage converter and Voltage to Current converter circuits, Low voltage DC voltmeter, Integrator, Differentiator, Qualitative studyof op- amp as comparator. **Filter:** First order active filters- low pass &high pass Filters, band pass, band reject filters. (Qualitative only). **Timer (IC 555):** Introduction, Block diagram, Astable and Monostable multivibrator circuits. (Numerical Examples wherever applicable).	**13**
Unit-III	**Logic Families:** Logic Families-classification of digital ICs. Characteristics oflogicfamilies,circuitdescriptionofTTLNANDgatewithtotempole	

	and open collector. TTL IC terminology. CMOS NAND, comparisonof TTL and CMOS families. Combinational Logic Circuits: SOP and POS, Minterm, Maxterm,SOP,SPOS,SimplificationofBooleanexpressions, Karnaughmap (2, 3 and 4 variable map) Pair, quad and octets. Simplification of Boolean function usingK-map (Overlapping groups, rollingthe map, redundant group and Don't care conditions). **Design of Arithmetic logic circuits:** Half Adder, Full Adder, HalfSubtractor, Full Subtractor. 4-bit parallel binary adder, 2-bit and 4-Bit magnitude comparator. Encoder, decimal to BCD priority encoder. Decoder, 2:4decoder,3:8decoder,BCDtodecimaldecoder,BCDto7-Segment decoder, Multiplexer - 4:1 and 8:1 multiplexer, Demultiplexer - 1:4 and 1:8 demultiplexer - logic diagram and truth table of each.	**13**
Unit-IV	**Sequential Logic Circuits:** Flip-Flops - SR Latch, RS, D and JK Flip- Flops. Clocked (Level andEdge Triggered) Flip-Flops. Pre-set and Clear operations. Race- around conditions in JK Flip-Flop. Master- Slave JK andT Flip-Flops. Applications of Flip-Flops in semiconductor memories, RAM, ROM and types. **Registers and Counters:** Types of Shift Registers, Serial-in-Serial-out,Serial-in-Parallel-out,Parallel-in-Serial-outandParallel-in-Parallel-out Shift Registers (only up to 4 bits), applications. **Counters:** Ring counter, Johnson counter applications. **Asynchronous Counters:** Logic diagram,Truthtableandtimingdiagramsof4-bitripplecounter,modulo-ncounters. **SynchronousCounter:**4-bitdecadeCounters.	**13**
RecommendedLeaningResources		
Reference Books	(1) ElectronicdevicesandcircuittheorybyBoylestad,RobertNashelsky (2) ElectronicDevicesConventionalCurrentVersionbyThomasL.Floyd (3) DavidA.Bell"ElectronicDevicesandCircuits",5thEdition,OxfordUni.Press, 2015 (4) OP-AmpsandLinearIntegratedCircuit,R.A.Gayakwad,4thedn,2000,Prentice Hall (5) Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011, Oxford UniversityPress. (6) R.S. Sedha, "A Text book of Applied Electronics", 7th edition. S. Chand andCompany Ltd. 2011 (7) ThomasL.Floyd,DigitalFundamentals,PearsonEducationAsia (1994) (8) Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw (9) Fundamentals of DigitalCircuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt.Ltd. (10) DigitalCircuitsandsystems,Venugopal,2011,TataMcGraw Hill. (11) DigitalSystems:Principles& Applications,R.J.Tocci,N.S.Widmer,2001,PHI Learning. (12) DigitalElectronics,S.K.Mandal,2010,1stedition,McGrawHill	

LaboratoryExperiments:

Year	I	CourseCode:126BSC02ELEDSC02L	Credits	2
Sem.	1	CourseTitle:ANALOGANDDIGITALELECTRONICS *(HardwareandCircuitSimulationSoftware)*	Hours	4 Hrs/week
FormativeAssessmentMarks:25		SummativeAssessmentMarks:25	Duration ofESA:4hrs.	

Sl.No	Experiment
	PART A(AnyFive)
1	StudyofJFETcharacteristics–determinationofparameters.
2	StudyofMOSFETcharacteristics–determinationofparameters.
3	UJTcharacteristicsand relaxationoscillator
4	SCR characteristics – determination of Holding current and firingvoltage for different gatecurrents.
5	DesignofinvertingamplifierusingOp-amp&studythefrequencyresponse.
6	Designofnon-invertingamplifierusingOp-amp&studythefrequencyresponse.
7	Op-ampasaadderandsubtractor.
	Designandstudyofdifferentiatorusingop-ampfordifferentinputwaveforms.
8	Designandstudyof integratorusingop-ampfordifferentinputwaveforms.
9	Designandstudyoffirstorderlow-passfiltersusingop-amp.
10	Designandstudyoffirstorderhigh-passfiltersusingop-amp.
11	AstablemultivibratorusingIC-555timer.
12	MonostablemultivibratorusingIC-555timer.
	PART B(AnyFive)
13	HalfAdderandFullAdderusinglogicgates
14	HalfSubtractorandFullSubtractorlogicgates
15	StudyoftheEncodersandpriorityencoders.
16	StudyofMultiplexerusinglogicgates.
17	StudyofDemultiplexerusinglogicgates.
18	Studyof2-bitand4-bitmagnitudecomparators.
19	StudyofClockedRS,DandJKFlip-Flopsusing NANDgates.
20	Studyof4-bitShiftRegister–SISO,modificationtoringcounterusingIC7495.

OPENELECTIVE

Year	I	**CourseCode:**126BSC02ELEOEC02T	**Credits**	**03**
Sem.	1	**CourseTitle:ElectronicsforEveryone**	**Hours**	**40**

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	Duration ofESA:2hrs.

UnitNo.	CourseContent	Hours
Unit-I	**Timer(IC555):**Introduction,Blockdiagram,AstableandMonostable multivibrator circuits and its application **Phase Locked Loop (PLL):** Functional block diagram – Phase detector / Comparator, Voltage Controlled Oscillator, Low pass filter. **ApplicationsofPLL:**Frequencymultiplier/Division,AMdetection.	**10**
Unit-II	**Operational Amplifier:** Introduction to Differential Amplifier, Block diagram of Op-Amp, Schematic symbol, Equivalent circuit for ideal op-amp, ideal voltage transfer curve, Characteristics Op-Amp, Op-Amp parameters, Op-Amp configurations (Open and closed loop configuration), Concept of Virtual Ground. **Op-Amp Applications:** Inverting and non-inverting amplifier, Summing Amplifier, Difference Amplifier, Integrator, Differentiator, Instrumentation Amplifier, Phase-shift and Wein bridge oscillator.	**10**
Unit-III	**Transducers (Basic Working):** Introduction, types of transducer, Displacement transducers - Resistive (Potentiometric, Strain Gauges –Types, Gauge Factor, bridge circuits, Semiconductor strain gauge)Capacitive (diaphragm), Hall effect sensors, Magneto- strictivetransducers, Microphone, Touch Switch, Piezoelectric sensors, Opto- Electronic transducer(PhotoconductiveorLDR,Photoemissive,Photovoltaic, Semiconductor Photo diode, Photo transistor), Temperature sensor (electrical and non-electrical), Pressure sensor.	**10**
Unit-IV	**Data Acquisition using Arduino:** Arduino--Birth, Open-Sourcecommunity, Functional Block Diagram, Functions of each Pin, Arduino Development Boards: IDE, I/O Functions, Looping Techniques, Decision Making Techniques, Designing of 1st sketch, Programming of an Arduino (Arduino ISP), Serial port Interfacing, Basic Interfacing and I/O Concept, Interfacing LED, Switch,7seg LED, different sensors.	**10**
Laboratory Demonstration	1. StudyofbasicMonostable/Astablemultivibrator. 2. Lightdetectionusing555timers. 3. Studyofbasicinvertingandnon-invertingamplifier. 4. Studyofbasicintegrator/differentiatorcircuit. 5. Test the different Arduino Boards, Open-Source and Arduino Shields. 6. InstallArduinoIDEanditsdevelopmenttool. 7. DevelopaprogramtoBlinkLEDfor1second. 8. InterfacingofvarioussensorswithArduinodevelopmentboard.	
RecommendedLeaningResources		
Reference Books	1.R.P.Bali,ConsumerElectronics,PearsonEducation(2008) 2.R.G.Gupta,AudioandVideosystems,TataMcGrawHill(2004)	

ASSESSMENTMETHODS

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	40marks
1st Internal Assessment Test for30 marks 1 hrafter8 weeks and 2nd 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**

AssessmentCriteria	25marks
1st Internal Assessment Test for20 marks 1 hr after8 weeks and 2nd 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:

AssessmentCriteria	25marks
Internaltest	15
VivaVoce/basicunderstandingoftheconcept	05
Journal/PracticalRecord	05
Total	**25**

SchemeofEvaluation forPracticalExamination

Sl. No.	Particulars	MarksAllotted Max. 25
1.	Basic formula with description, nature of graph if any& indication ofunit	05
2.	Tracingof schematic raydiagram/Circuit diagram with description and tabulation	05
4.	Experimentalskill& connection	05
5.	Recordofobservation,	05
6.	Calculationincludingdrawinggraph	04
7.	Resultwithunit	01
	Total	**25**

QuestionPaperPattern:

ELECTRONICS

I/IISemesterB.Sc.

Sub: **Code:** **MaximumMarks:60**

Q.No.1.	**Answer any Six Questions** ***(Two question from Each Unit to be asked)*** **a.** **b.** **c.** **d,** **e.** **f.** **g.** **h.**	**6X2=12**
Q.No.2.	**(QuestionsfromUnit-I) a.** **b.** **OR** **c.** **d.**	 **08** **04** **08** **04**
Q.No.3.	**(Questions from Entire Unit-II)** **a.** **b.** **OR** **c.** **d.**	 **08** **04** **08** **04**
Q.No.4.	**(Questions from Unit-III)** **a.** **b.** **OR** **c.** **d.**	 **08** **04** **08** **04**
Q.No.5.	**(Questions from Unit-IV)** **a.** **b.** **OR** **c.** **d.**	 **08** **04** **08** **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. Ifnecessary,subquestionsaandcfrom2to5maybesubdividedintoi.andii. Without exceeding maximum 08 marks.

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DIST:BAGALKOTE

STATISTICS

FIRSTANDSECONDSEMESTERSYLLAB

As per NEP2020 and adapted fromRCU Belagavi

applicable from the

AcademicYear 2023-24

STATISTICS:

CreditsStructureunderChoiceBasedCreditSystem[CBCS]ofStatisticsMajor&OneMinorDisciplineSchemeforthe Threeyear/ Four YearsStatistics B.Sc. /B.Sc. HonorsProgramme with effect from2023-24

SEMESTER-I										
Category	Coursecode	Titleofthe Paper	Marks			Teaching hours/week			Credit	Durationn of exams (Hrs)
			IA	SEE	Total	L	T	P		
DSC1	**126BSC01STADSC91T**	**Descriptive Statistics**	40	60	100	4	-	-	4	2
	126BSC01STADSC01L	**Practical CourseII**	25	25	50	-	-	4	2	4
OEC1	126BSC01STAOEC01T	Statistical Methods	40	60	100	3		-	3	2

SEMESTER-II										
Category	Coursecode	Title of thePaper	Marks			Teaching hours/week			Credit	Durationn of exams (Hrs)
			IA	SEE	Total	L	T	P		
DSC2	**126BSC02STADSC02T**	**Probability and Distributions**	40	60	100	4	-	-	4	2
	126BSC02STADSC02L	**Practical CourseII**	25	25	50	-	-	4	2	4
OEC 2	126BSC02STAOEC02T	Business Statistics	40	60	100	3	-	-	3	2

COURSE-WISESYLLABUS

Semester-I

CourseTitle:DescriptiveStatistics	CourseCode:**126BSC01STADSC91T**
TotalContactHours:56	CourseCredits:04
FormativeAssessmentMarks:40	DurationofESA/Exam:2hours
	SummativeAssessmentMarks:60

TitleoftheCourse:DescriptiveStatistics

Number of TheoryCredits	Number of lecture hours/semester	Numberof practical Credits	Number of practical hours/semester
4	56	2	52

ContentofTheoryCourse1	56 Hrs
Unit–1:IntroductiontoStatistics	**14 Hrs**
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:UnivariateData Analysis	**14 Hrs**
Measures of Central Tendency: Mean, weighted mean, Median, Mode, Geometric and harmonic means,properties,meritsandlimitations,relationbetweenthesemeasures. Measuresof Dispersion Range, Quartile deviation, Mean deviation, Standard deviation and their relative measures. Gini' Coefficient, LorenzCurve.Moments, SkewnessandKurtosis.Quantiles and measures basedon them.Box Plot. Outliers.normal datasets. (Ref.10).	
Unit–3:BivariateDataAnalysis	**14 Hrs**
BivariateData,Scatterplot,Correlation,KarlPearson'scorrelationcoefficient,Rankcorrelation – Spearman's and Kendall's measures. Concept of errors, Principle of least squares, fitting o polynomialand exponentialcurves.Simplelinear regressionanditsproperties.Fitting of linear regressionlineandcoefficientofdetermination.(Ref.10)	
Unit–4:Multivariate DataAnalysis	**14 Hrs**

References

Analysis of Categorical Data: Contingency table, independence and association of attributes, measuresofassociation-oddsratio,Pearson'sandYule's measure,MultivariateFrequencies, MultivariateDataVisualization,meanvectoranddispersion matrix,Multiplelinearregression,multipleandpartialcorrelationcoefficients.Residualerror variance. (Ref. 7)	

1. Agresti,A.(2010):AnalysisofOrdinalCategoricalData,2ndEdition,Wiley.
2. Anderson T.W. and Jeremy D. Finn (1996). The New Statistical AnalysisofData,Springer
3. Freedman,D.,Pisani,R.andPurves,R.(2014),Statistics,4thEdition,W.W. Norton&Company.
4. Gupta,S.C.(2018),FundamentalofStatistics,HimalayaPublishingHouse,7th Edition.
5. GuptaS.C. and V.K. Kapoor (2020), Fundamental ofMathematical Statistics,SultanChand and Co. 12th Edition.
6. Hogg,R.V. McKeanJ. W.and Craig,A.T. (2012), Introduction toMathematicalStatistics, Pearson 7th Edition.
7. JoaoMendesMoreira,AndreCPLFdeCarvalho,TomasHorvath (2018),GeneralIntroduction to Data Analytics, Wiley.
8. Johnson,R.A.andBhattacharyya,G.K.(2006),Statistics:Principlesand methods.5thEdition, John Wiley & Sons, New York.
9. Medhi,J.(2005),StatisticalMethods,NewAgeInternational.
10. Ross, S.M. (2014), Introduction to Probability and Statistics for Engineers andScientists, 5th Edition, Academic Press.
11. Tukey,J.W.(1977),ExploratoryDataAnalysis,Addison-WesleyPublishingCo.

Year	I	**CourseCode:126BSC01STADSC01L**	**Credits**	02
Sem.	I	**CourseTitle:** PracticalCourse-I	**Hours**	45
CoursePre-requisites,ifany:		KnowledgeofExcel		
FormativeAssessmentMarks: 25		SummativeAssessmentMarks:25	DurationofESA:03hrs.	

ContentofPracticalCourse-I

(Computingall the practicalsmanuallyandusingExcel)

1. Presentation ofdatabyfrequencytables, diagramsandgraphs, stemand leaf,partition values.
2. ArithmeticMean(AM),geometricmean, harmonicmean,weightedAM, correctedmean.
3. Mode,median,partitionvalues.
4. Absoluteandrelativemeasuresofdispersion,Boxplots.
5. Problemsonmoments,skewnessandkurtosis.
6. Fittingofcurvesbyleastsquaresmethod
7. Productmomentcorrelationcoefficientandrankcorrelation.
8. Regressionoftwo variables.
9. MultivariateDescriptivestatistics, mean Vector, dispersion matrix correlationmatrix, Partial and Multiple correlation.
10. ProblemsonAssociationofattributes.

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	40marks
1st InternalAssessmentTestfor30marks1hrafter8weeksand2nd Internal Assessment Test for 30 marks 1 hr after 15 weeks . Averageof two tests should be considered.	30
Assignment	10
Total	**40**

AssessmentCriteria	25marks
1st InternalAssessmentTestfor20marks1hrafter8weeksand2nd InternalAssessmentTestfor20marks1hrafter15weeks.Averageoftwo tests should be considered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	25marks
SemesterEndInternalAssessmentTestfor20marks2hrs	20
Journal(Practical Record)	05
Total	**25**

QuestionPaperPattern:

Statistics

ISemesterB.ScStatistics

Sub: **Code:** **MaximumMarks:60**

a. AnsweranySixQuestionsfromQuestion1 each QuestionsfromQuestion2,3,4and5 **b.AnsweranyThree**

Q.No.1.	**AnsweranySixQuestions(AtleastTwoquestion fromEachUnit)** **a.** **b.** **c.** **d,** **e.** **f.** **g.** **h.**	**2X6=12**
Q.No.2.	**(ShouldcoverEntireUnit-I)a. b.** **c.** **d.**	**4X3=15**
Q.No.3.	**(ShouldcoverEntireUnit-II)a.** **b.** **c.** **d.**	**4X3=15**
Q.No.4.	**(ShouldcoverEntireUnit-III) a.** **b.** **c.** **d.**	**4X3=15**
Q.No.5.	**(ShouldcoverEntireUnit-IV)a. b.** **c.** **d.**	**4X3=15**

StatisticalMethods(OpenElective)

Year	I	CourseCode:126BSC01STAOEC01T CourseTitle:StatisticalMethods	Credits	03
Sem.	1		Hours	40

CoursePre-requisites,ifany	NA	
FormativeAssessmentMarks:40	SummativeAssessment Marks:60	DurationofESA:.02hrs.

CourseObjectives

1. Thisisanopenelectivecourseforotherthanstatisticsstudents.
2. Thestudentswilllearntheelementsofdescriptivestatistics,probability, statistical methods such as tests of hypotheses, correlation and regression.

CourseOutcomes

Studentswillbeableto;

CO1.Acquireknowledgeofstatisticalmethods.

CO2.Identifytypesofdataandvisualization,analysisandinterpretation.

CO3.Knowabout elementaryprobabilityand probabilitymodels. CO4.

Employ suitable test proceduresfor given data set.

Contents

Unit1:Introduction 10Hours

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 (definitionsand methods only). Concepts of sampling andnon-sampling errors.

Unit2: Univariateand BivariateDataAnalysis 10Hours

Measures of Central Tendency: mathematical and positional. Measuresof Dispersion: range, quartile deviation,meandeviation,standarddeviation,coefficientofvariation,moments,skewnessandkurtosis.

Bivariatedata,scatterdiagram,Correlation,Karl-Pearson'scorrelationcoefficient, Rankcorrelation.Simplelinearregression,principleofleastsquaresandfittingof

polynomialsandexponentialcurves.

Unit3:ProbabilityandDistributions 10Hours

Probability: Random experiment, trial, sample space, events-mutually exclusive and exhaustiveevents.Classical,statisticalandaxiomaticdefinitionsofprobability,addition andmultiplicationtheorems,Bayestheorem(onlystatements).Discreteandcontinuous random variables, probability mass and density functions, distribution functions, expectation of a random variable.

Standardunivariatedistributions: Binomial,PoissonandNormaldistributions (Elementaryproperties and applications only).

Unit4:SamplingDistributionsandTestingofHypothesis 10Hours

Distribution of sample mean from anormalpopulation,Chi-square,t andF distributions(No derivations) and their applications.

Statistical Hypothesis – null and alternative hypothesis, simple and composite hypothesis.TypeIandTypeIIerrors,levelofsignificance,criticalregion,P-valueandits interpretation.Testforsinglemean,equalityoftwomeans,singlevariance,andequality of two variances for normal populations.

References

1. Daniel,W.W.(2007Biostatistics-AFoundationforAnalysisintheHealthSciences,Wiley
2. T.W.AndersonandJeremyD.Finn(1996).TheNewStatisticalAnalysisofData,Springer.
3. MukhyopadyayaP(1999).AppliedStatistics,NewCentralbookAgency,Calcutta.
4. Ross,S.M.(2014)IntroductiontoProbabilityandStatisticsForEngineersandScientists.
5. Cochran,WG(1984):SamplingTechniques,WileyEastern,NewDelhi.

B.Sc.Semester-II

CourseTitle:Probability and Distributions	
TotalContactHours:56	Course Credits:04
FormativeAssessmentMarks:40	DurationofESA/Exam:2hours
	SummativeAssessmentMarks:60

CoursePre-requisite(s):II PUCwithMathematics

TitleoftheCourse:Probability and Distributions

Number of TheoryCredits	Number of lecture hours/semester	Numberof practicalCredits	Numberofpractical hours/semester
4	56	2	52

ContentofTheory Course 2	56Hrs
Unit–1:Probability	**14Hrs**
Random experiment, sample space and events, algebra of events. Definitions of Probability-Classical,statistical,subjectiveandaxiomaticapproaches – illustrationsandapplications, Addition rule, Conditional probability, independence of events and multiplicationrule, Totalprobabilityrule, Bayes theorem- applications.	
Unit–2:RandomVariablesAndMathematicalExpectation-(OneDimension)	**14Hrs**
Definitionsofdiscreteandcontinuousrandomvariables,Distributionfunction,probabilitymas anddensityfunctions–propertiesandillustrations, Expectationof a randomvariable andrule of expectation and related results, Moments and moment generatingfunction–propertiesanduses.	
Unit–3:StandardDistributions	**14Hrs**
Bernoulli, Binomial, Poisson, distributions– mean, variance, moments and m. g. f. recursiv relations for probabilities and moments of Binomial and Poisson distributions, Norm distribution and its properties.	

Unit–4:DataAnalysisUsingR	**14 Hrs**
Introduction to R: Installation, command line environment, overview of capabilities, brie mentionofopensourcephilosophy. Rasacalculator:Thefourbasic arithmeticoperations. 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.ThedifferenttypesofnumbersinR:DivisionbyzeroleadingtoInfor-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. Barplot,PiechartandHistogram.Boxplot.Scatterplotandsimplelinearregressionusing lm(y~x). Problems on discrete and continuous probabilitydistributions.	

References

1. Dudewitz.E.J.andMishra.S.N.(1998),ModernMathematicalStatistics.JohnWiley.
2. Goon A.M., Gupta M.K., Das Gupta .B. (1991), Fundamentals of Statistics, Vol. I,World Press, Calcutta.
3. Gupta.S.CandV.K.Kapoor(2020),FundamentalsofMathematical Statistics, SultanChand and Co, 12th Edition.
4. Hogg,R.V.,Tanis,E.A.andRaoJ.M.(2009),ProbabilityandStatistical Inference,Seventh Edition, Pearson Education, New Delhi.
5. Mood, A.M., Graybill, F.A. and Boes, D.C. (2007), Introduction to the TheoryofStatistics,3rdEdition.(Reprint),TataMcGraw-HillPub.Co.Ltd.
6. Ross,S.(2002),AFirstCourseinProbability,PrenticeHall.
7. SudhaG.Purohit,SharadD.Gore,ShailajaRDeshmukh,(2009), Statistics Using R,Narosa Publishing House.
8. Rfor beginners by Emmanuel Paradis (freelyavailable at **https://cran.r-project.org/doc/contrib/Paradisrdebuts_en.pdf**)

Year	I	**CourseCode:126BSC02STADSC02L**	**Credits**	02
Sem.	II	**CourseTitle:**PracticalCourse- II	**Hours**	45
CoursePre-requisites,ifany:		KnowledgeofExceland R		
FormativeAssessmentMarks:25		SummativeAssessmentMarks: 25	DurationofESA:03hrs.	

ContentofPracticalCourse2:ListofExperimentstobeconducted

(ComputingallthepracticalsmanuallyandusingExcel/R)

1. Two exercise on Descriptive statistics (Presentations, Summarizations,correlations,regressionandGraphsusing R)
2. Computingprobability:usingadditionandmultiplicationtheorems.
3. ConditionalprobabilityandBayes'theorem.
4. Problemsonpmf,expectation,variance,quantiles, skewness, kurtosis(Discrete Case).
5. Problems on pdf, expectation,variance,quantiles, skewness, kurtosis(Continuous case).
6. Problemsondiscreteprobabilitydistributions(BinomialandPoisson)
7. ProblemsonNormalprobabilitydistributions
8. ComputationofmomentsandMomentgeneratingfunctions (Discrete and Continuous Case).
9. FittingofdistributionsBinomial,Poisson,Normaldistributions.
10. Generationofrandomsamples.(Binomial,Poisson, Normal)

Year	I	CourseCode:126BSC02STAOEC02T	Credits	03
Sem.	II	CourseTitle:**BusinessStatistics**	Hours	40
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60	DurationofESA:.02hrs.	

2.BusinessStatistics (OpenElective)

CourseObjectives

1. Provideanintroductiontobasicsofstatisticswithinafinancialcontext.
2. Toenablestudentstousestatisticaltechniquesforanalysisand interpretation of business data.

CourseOutcomes (CO)

Uponthecompletionofthiscoursestudentsshouldbeableto:

CO1.Frame and formulate management decision problems.

CO2.Understandthebasicconceptsunderlying quantitativeanalysis.

CO3.Usesoundjudgmentintheapplicationsofquantitativemethodstomanagement decisions.

Pedagogy

1. Thecourseistaughtusingtraditionalchalkandtalkmethodusing problem solving through examples and exercises.

2. Studentsareencouragedto useresourcesavailableonopensources.

Contents

Unit 1: Statistical Data and Descriptive Statistics **10Hours**

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 partitionvalues 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, Measurementusing KarlPearson andBowley'smeasures; Concept ofKurtosis.

Unit2:SimpleCorrelationandRegressionAnalysis **10Hours**

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.

Unit3:IndexNumbers ***10Hours***

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:

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 ofInflation rate –CPI and GNP Deflator.

Unit4:TimeSeriesAnalysis 10Hours

Introduction, definition and components of Time series, illustrations, Additive, Multiplicativeandmixedmodels,analysisoftimeseries,methodsofstudyingtimeseries: Secular trend, method of moving averages, least squares method – linear,quadratic, exponential trend fittings to the data. Seasonal variation - definition, illustrations, measurements,simple averagemethod,ratioto movingaveragemethod,ratiooftrend method, link relatives method, Cyclical variation- definition, distinction from seasonal variation, Irregular variation- definition, illustrations.

References

1. Levin, Richard, David S. Rubin, Sanjay Rastogi, and H M Siddiqui. Statistics for Management. 7th ed., Pearson Education.
2. David M. Levine, Mark L. Berenson, Timothy C. Krehbiel, P. K.Viswanathan, Business Statistics: A First Course, Pearson Education.
3. SiegelAndrewF.PracticalBusinessStatistics.McGrawHillEducation.
4. Gupta,S.P.,andArchanaAgarwal.BusinessStatistics,SultanChandandSons,New Delhi.
5. VohraN.D.,BusinessStatistics,McGrawHillEducation.
6. Murray R Spiegel, Larry J. Stephens, Narinder Kumar. Statistics (Schaum's Outline Series), Mc-Graw Hill Education.
7. Gupta,S.C.FundamentalsofStatistics.HimalayaPublishingHouse.
8. Anderson, Sweeney, and Williams, Statistics for Students of Economics and Business, Cengage Learning.

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DIST:BAGALKOTE

BIOTECTNOLOGY

FIRSTANDSECONDSEMESTERSYLLABUS

Asper NEP 2020 and adapted fromRCU Belagavi

Applicable from the

AcademicYear2023-24

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										
Category	**Coursecode**	**Titleofthe Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration ofexams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01BITDSC091T**	CellBiologyand Genetics	40	60	100	4	-	-	4	2
	126BSC01BITDSC01L	CellBiologyand Geneticslab	25	25	50	-	-	4	2	4
OEC1	126BSC01BITOEC01T	Biotechnologyfor Human welfare	40	60	100	3	-	-	3	2

******Exitoptionwithcertificate(50 credits)**

SEMESTER-II										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02BITDSC02T**	Microbiological methods&Techniques	40	60	100	4	-	-	4	2
	126BSC02BITDSC02L	Microbiological methods & Techniqueslab	25	25	50	-	-	4	2	4
OEC2	126BSC02BITOEC02T	Applications of Biotechnologyin Agriculture	40	60	100	3	-	-	3	2

EvaluationSchemefor InternalAssessment:

Theory:

AssessmentCriteria	40marks
1st Internal Assessment Test for30 marks 1 hr after 8 weeks and 2nd Internal Assessment Test for 30 marks 1 hr after 15 weeks . Averageoftwotestsshouldbeconsidered.	30
Assignment/viva	10
Total	**40**

AssessmentCriteria	25marks
1st Internal Assessment Test for20 marks 1 hr after 8 weeks and 2nd Internal Assessment Test for 20 marks 1 hr after 15 weeks . Averageoftwotestsshouldbeconsidered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	25marks
SemesterEndInternalAssessmentTestfor7marks2hrs	20
Journal(PracticalRecord)	05
Total	**25**

QuestionPaperPattern:

Duration:2hr ***I SemesterB.Sc*****(**Biotechnology**)**

Sub: **Code:** **MaximumMarks:60**

a. **AnsweranySIXQuestionsfromQuestion1**

b. **b.Answer anyThreeeachQuestionsfromQuestion2,3,4and5**

Q.No.1.	**Answer any SIX Questions (Two question fromEach 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) Biotechnology-Semester1
TitleoftheCourse:DSC-1:Subjectcode:126BSC01BITDSC91T
Paper: CellBiologyand Genetics

Number ofTheoryCredits	Number of lecturehours/ semester	Numberof practical credits	Number of practicalhours/ semesters	
4	56	2	56	

Unit No.	CourseContent	Hours
UnitI	**Cell as a Basic unit of Living Systems and Cellular Organelles** Concept, Development and Scope of Biotechnology. Historical perspectives. Discovery of cell, the cell Theory, Ultra structure of a eukaryotic cell- (Both plant and animal cells), **Surface Architecture:** Structural organization and functions of plasma membrane and cell wall of eukaryotes. **Cellular Organelles:** Structure and functions of cell organelles – Endoplasmic reticulum, Golgi complex, Mitochondria, Chloroplast, Ribosomes, Lysosomes, Peroxisomes, Nucleus (Nuclear envelope with nuclear pore complex, Nucleolus, Nucleoplasm and Chromatin). Vacuole, Cytosol and Cytoskeleton structures (Microtubules, Microfilaments and Intermediate filaments).	14
UnitII	**ChromosomesandCellDivision** General Introduction, Discovery, Morphology and structural organization – Centromere, Secondary constriction, Telomere, Chromonema, Euchromatin and Heterochromatin, Chemical composition and Karyotype. Single-stranded and multi-stranded hypothesis, folded-fibre and nucleosome models. Special type of chromosomes: Salivary gland and Lamp brush chromosmes. **Cell Division**: Cell cycle, phases cell division. Mitosis and meiosis, regulation of cell cycles cell cycle checkpoints, and enzymesinvolvedin regulation, Significance of cell cycle, mitosis and meiosis interphase nucleus, achromatic apparatus, synaptonemal complexCellCycleandregulation,mitosisandmeiosis.Cell	14

	Senescenceandprogrammedcelldeath.	
UnitIII	**Genetics**: 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 andinteraction of genes (13:3 ratio), epistasis. **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.	14
Unit IV	**Unit-4.LinkageandCrossingOver** 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 allosomes and autosomes, XX-XY, XX-XO, ZW-ZZ, ZO-ZZtypes. **Human Genetics:** Karyotype inman, inherited disorders – Allosomal (Klinefelter syndrome and Turner‟ssyndrome), Autosomal (Down syndrome and Cri-Du-Chat Syndrome).	14

Semester-I;Course:Practical

Paper:CellBiologyandGenetics;PaperCode:126BSC01BITDSC01L

Studyandmaintenanceofsimpleandcompoundmicroscope

1) Use of Micrometer and calibration, measurement of onion epidermal cells and yeast
2) Studyofdivisionalstagesinmitosisfromonionroottips
3) Study of divisional stages in meiosis in grasshopper testes/onion orRhoeo flowerbuds.
4) Mountingofpolytenechromosomes
5) Buccalsmear-Barrbodies
6) Karyotypeanalysis- HumanandOnion Human–NormalandAbnormal–DownandTurner‟ssyndromes
7) IsolationandstainingofMitochondria
8) IsolationandstainingofChloroplast
9) RBCcellcountbyHaemocytometer
10) Simplegeneticproblemsbasedontheory

- Eachstudentisrequiredtosubmit5 permanentslidesofmitosis&meiosis

TextBooks/References

Reference:

1. MolecularBiologyofCell- BruceAlbertsetal,Garlandpublications.
2. Animal Cytology and Evolution- MJD, White Cambridge University Publications
3. MolecularCellBiology-Daniel,ScientificAmericanBooks
4. CellBiology-JackdBruke,TheWilliamTwilkinsCompany
5. Principles of Gene Manipulations- Old & Primrose, Black Well Scientific Publications
6. CellBiology-Ambrose&DorothyMEasty,ELBSPublications
7. FundamentalsofCytology-L.W.Sharp,McGrawHillCompany
8. Cytology-Willson&Marrison,ReinformPublications
9. MolecularBiology-Christopher Smith,Faber&FaberPublications
10. Cell Biology & Molecular Biology – EDP De Robertis& EMF Robertis, SaunderCollege.
11. CellBiology-C.BPowar,HimalayaPublications
12. BasicGenetics-DanielL.Hartl,Jones&BarlettPublishersUSA
13. HumanGeneticsandMedicinelarkEdward ArnoldPLondon
14. Genetics–MonroeWStrickberger,MacmillainPublishers,NewYork
15. GenesV-BenjaminLewin,OxfordUniversityPress.
16. GenesI-BenjaminLewin,WileyEasternLtd.,Delhi
17. GenesII-BenjaminLewin,Wiley&SonsPublications
18. GenesIII-BenjaminLewin,Wiley&SonsPublications

OPEN-ELECTIVESYLLABUS:

BScSemester1–B.Sc(Hons) Biotechnology
Title of the Course: Open Elective (OE-1): Biotechnology for Human Welfare
Course code: 126BSC01BITOEC01T

Courses	Credits	No. of Classes/Week	TotalNo. of Lectures/ Hours	Duration ofExam inhrs	Internal Assessment Marks	Semester End Exam Marks	TotalMarks
Theory	03	03	42	2	40	60	100

UnitNo.	CourseContent	Hours
UnitI	**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
UnitII	**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
UnitIII	**Forensicscience** Application of biotechnology in forensic science: Solvingcrimes of murder and rape; solvingclaims of paternity and theft by using DNA finger printing techniques **Health** Applicationofbiotechnologyinhealth: 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. PatelAH.(1996).IndustrialMicrobiology.1st edition,MacmillanIndiaLimited.
3. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
4. EnvironmentalBiotechnology,PradiptaKumarMohapatra

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 inthe NewMillennium, University of Delhi, Delhi (2002).
8. S.H. James andJ.J. Nordby, Forensic Science: An Introduction to Scientificand 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-Semester2

TitleoftheCourse:DSC-2:Subjectcode:126BSC02BITDSC02T

Paper:MicrobiologicalMethods

Numberof TheoryCredits	Number of lecture hrs./semester	Numberof practicalCredits	Numberofpractical hrs./ Sem
4	56	**2**	**56**

UnitNo.	CourseContent	Hours
UnitI	**InstrumentsusedinBiotechnology** Microscopy: Principles of Microscopy- resolving power, numerical aperture, working principle and applications of Compound microscope, Dark field microscope, Phase contrast microscope, Fluorescence Microscope,confocalmicroscope,ElectronMicroscopes-TEMand SEM. **Analytical techniques:** Working principles and applications: Centrifuge,Ultracentrifuge,Spectrophotometer,Chromatography:Paper and TLC	14
UnitII	**Sterilizationtechniques** 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 airoven. 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, metallicsalts, Quaternaryammonium compoundsandsterilizinggasesas antimicrobialagents;	14
UnitIII	**Microbiologicaltechniques** **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	**Antimicrobialagents** 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 Antifungalagents:MechanismofactionofAmphotericinB,	14

	Griseofulvin Antiviralagents:Mechanismof actionof Amantadine,Acyclovir, Azidothymidine Antibioticresistance,MDR,XDR,MRSA,NDM-1 Antibiotic sensitivitytesting methods: Disc and Agar well diffusion techniques	

Course:Practical
Paper:MicrobiologicalMethods;PaperCode: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. SterilizationofmediumusingAutoclaveandassessmentforsterility
3. SterilizationofglasswareusingHotAirOvenandassessmentforsterility
4. Sterilization of heat sensitive material by membrane filtration and assessment for sterility
5. Preparationofculturemediaforbacteria,fungiandtheircultivation.
6. Platingtechniques:Spreadplate,pourplate andstreakplate.
7. Isolationofbacteriaandfungifromsoil,water andair
8. StudyofRhizopus,Penicillium,Aspergillususingtemporarymounts
9. Colonycharacteristicsstudyofbacteriafromairexposureplate
10. Staining techniques: Bacteria– Gram, Negative, Capsule, Endospore staining Fungi – Lactophenol cotton blue staining
11. Wateranalysis-MPNtest
12. BiochemicalTests–IMViC,Starchhydrolysis,Catalase test,Gelatinhydrolysis
13. Bacterialcellmotility-hangingdroptechnique

**Anytwoexperimentsgivencarrying20and 15markeachexperiment.

TextBooks/ References

1. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T. Brown Publishers.
2. Black JG. (2008). Microbiology: Principles and Explorations. 7th edition. PrenticeHall
3. MadiganMT,andMartinkoJM.(2014). Brock Biology ofMicro-organisms.14th edition. Parker J. Prentice Hall International, Inc.
4. PelczarJrMJ,ChanECS,andKriegNR.(2004).Microbiology.
5. 5theditionTataMcGrawHill.
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. TortoraGJ,FunkeBR,andCaseCL.(2008).Microbiology:AnIntroduction.9th edition Pearson Education.
9. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott‟s Microbiology. 9th edition. McGraw Hill Higher Education.

10. CappucinoJandShermanN.(2010).Microbiology:ALaboratoryManual.9th edition. Pearson Education Limited
11. Microbiology-ConceptsandapplicationsbyPaulA.Ketchum,WileyPublications
12. FundamentalsofMicrobiology–Frobisher,Saunders&ToppanPublications
13. IntroductoryBiotechnology-R.BSinghC.B.D.India(1990)
14. FundamentalsofBacteriology-Salley
15. FrontiersinMicrobialtechnology-P.S.Bison,CBSPublishers.
16. Biotechnology,InternationalTrendsofperspectivesA.T.Bull,G.
17. GeneralMicrobiology–C.B.Powar

OPEN-ELECTIVESYLLABUS

TitleoftheCourse:OEC-2:Subjectcode:126BSC02BITOEC02T

Paper:ApplicationsofBiotechnologyinAgriculture

B.Sc.Semester–II

Courses	Credits	No. of Classes/Week	Total No. of Lectures/Hours	Durationof Examin hrs	Internal Assessment Marks	Semester End Exam Marks	Total Marks
Theory	03	03	42	2	40	60	100

UnitNo.	CourseContent	Hours
UnitI	**AgriculturalBiotechnology** Concepts and scope of biotechnology in Agriculture. Plant tissue culture, micro propagation, entrepreneurship in commercial plant tissue culture.Bananatissueculture -primary andsecondary commercial setups ,Small scale bioenterprises: Mushroom cultivation	14
UnitII	**Transgenicplants** The GM crop debate – safety, ethics, perception and acceptance of GM crops GMcropscase study:Btcotton,Btbrinjal Plants as biofactories for molecular pharming : edible vaccines, plantibodies, nutraceuticals.	14
UnitIII	**Bt basedpesticides** Baculoviruspesticides,Mycopesticides, Post-harvestProtection: AntisenseRNAtechnology for extending shelf life of fruits and shelf life of flowers. GeneticEngineeringforqualityimprovement: Seedstorage proteins, Flavours–capsaicin, vanillin	14

TextBooks/References

1. Prescott,Harley, Klein‟s Microbiology, J.M.Willey,L.M. Sherwood, C.J.Woolverton, 7th International, edition 2008, McGraw Hill.
2. FoundationsinMicrobiology,K.P.Talaro,7thInternationaledition2009, McGrawHill.
3. ATextbookofMicrobiology,R.C.DubeyandD.K.Maheshwari,1stedition,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 educationlimited.
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 Wileyand Sons (Asia) Pvt. Ltd. Singapore. 869 pp.
9. Atlas,R.M.1984.Basicandpracticalmicrobiology.MacMillanPublishers,USA.987pp.
10. Black,J.G.2008.Microbiology principlesandexplorations.7edn.JohnWiley andSons Inc., New Jersey 846 pp.
11. Pommerville,J.C.Alcamo"sFundamentals ofMicrobiology.JonesandBartlettPub..Sudburry, 835 pp.
12. Schlegel, H.G. 1995.General Microbiology. Cambridge UniversityPress, Cambridge, 655pp.
13. Toratora, G.J.,Funke,B.R. and Case,C.L.2007. Microbiology 9th ed.Pearson Education Pte. Ltd., San Francisco. 958pp.

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

MICROBIOLOGY

FIRSTANDSECONDSEMESTERSYLLABUS

Asper NEP2020 and adapted fromRCU Belagavi

Applicable from the

AcademicYear2023-24

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										
Category	**Coursecode**	**Titleofthe Paper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01MIBDSC91T**	General Microbiology	40	60	100	4	-	-	4	2
	126BSC01MIBDSC01L	Microbiology Lab-1	25	25	50	-	-	4	2	4
OEC1	126BSC01MIBOEC01T	Microbial Technologyfor HumanWelfare	40	60	100	3	-	-	3	2

SEMESTER-II										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02MIBDSC02T**	Microbial Biochemistryand Physiology	40	60	100	4	-	-	4	2
	126BSC02MIBDSC02L	Microbiology Lab-2	25	25	50	-	-	4	2	4
OEC2	126BSC02MIBOEC02T	Environmental and Sanitary Microbiology	41	60	100	3	-	-	3	2

ASSESSMENTMETHODS

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	40marks
1st Internal Assessment Test for 30 marks 1 hr after 8 weeks and 2nd Internal Assessment Test for30 marks 1 hr after 15 weeks. Average of two tests should be considered.	30
Assignment	10
Total	**40**

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

Practical:

AssessmentCriteria	25marks
SemesterEndInternalAssessmentTestfor20marks2hrs	20
Journal(PracticalRecord)	05
Total	**25**

QuestionPaperPattern:

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

Sub: Code: MaximumMarks:60

a. **AnsweranySixeQuestionsfromQuestion1**

b. **AnsweranyThreeeachQuestionsfromQuestionnumbers2,3,4and5**

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.	**Answer any Three (Should cover Entire Unit-I)** **a.** **b.** **c.** **d.**	**4X3=12**
Q.No.3.	**Answer any Three(Should cover EntireUnit-II)** **a.** **b.** **c.** **d.**	**4X3=12**
Q.No.4.	**Answer any Three (Should cover EntireUnit-III)** **a.** **b.** **c.** **d.**	**4X3=12**
Q.No.5.	**Answer any Three (Should cover Entire Unit-IV)** **a.** **b.** **c.** **d.**	**4X3=12**

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

CourseTitle:GeneralMicrobiology	
TotalContactHours:**56**	CourseCredits:**4+2**
FormativeAssessmentMarks:**40%**	Durationof ESA/Exam:**2Hrs**
ModelSyllabusAuthors: **Curriculum Committee**	SummativeAssessmentMarks:**60%**

CourseOutcomes(COs):
Attheendofthecoursethestudentshouldbeableto:
(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. **Thoroughknowledgeandunderstandingofconceptsofmicrobiology.**
2. **Learningandpracticingprofessionalskillsinhandlingmicrobes.**
3. **Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.**

Semester:I

BScMicrobiology(Basic/Hons.)

Coursecode:126BSC01MIBDSC01T **Papertitle:GeneralMicrobiology**

Number of Theory Credits	Number of lecture hours/semester	Numberof labCredits	Numberoflecturehours/semester
4	**56**	**2**	**56**

Unit – 1: Historical development, major contributions, origin of microorganisms and microscopy	14Hrs
Historicaldevelopmentofmicrobiology-Theoryofspontaneousgeneration BiogenesisandAbiogenesis.ContributionsofAntonVonLeeuwenhoek,Louis Pasteur,RobertKoch,JosephListerandEdwardJenner,AlexanderFleming MartinusBeijirinic,SegeiWinogrodsky,EleiMetechnikoff.ContributionsoIndian scientists in the field of Microbiology. Fossil evidences of microorganisms Originoflife,primitivecellsandevolutionofmicroorganisms.Microcopy workingprinciple,constructionandoperationofsimpleandcompoundmicroscopes.	
Unit–2:Staining,sterilizationandpreservationofmicroorganisms	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
OverviewofProkaryoticCellStructure:Size,shape,arrangement.Diagramof Prokaryoticcellorganisation,cellwallstructureandGramstaining,celmembrane; Bacterial and Archaeal, Cytoplasmic matrix-Cytoskeleton, ribosome inclusiongranules:Compositionandfunction.NuclearMaterials– Bacteriachromosomes structure (its differences with the Eukaryotic chromosome); ExtraChromosomalmaterials.Componentsexternaltocellwall-capsule,slime,s layer, pilli, fimbriae, flagella; structure, motility, chemotaxis. Bacterial Endospore -Examplesofsporeformingorganisms,habitats,function,formationand germination. Reproductioninbacteriaandbacterialcellcycle.	
Unit–4:Types,structure,organisationandreproductionofeukaryotic microorganisms	14Hrs
Overviewofeukaryoticcellstructure:GeneralstructureandtypesofcellsExternal cell coverings and cell membrane. Structure and function of Cytoplasmic matrix-cytoskeleton:Structureandfunction;singleMembraneorganelles Endoplasmicreticulum,Golgicomplex,Lysosomos,VesiclesandRibosomes DoubleMembraneorganelles-Nucleus,MitochondrionandChloroplastStructure andFunctions;Peroxisomes;Organellesofmotility-Structureandmovementofflagellaandcilia.	

Microbiology lab contents –Semester-I

Course code: 126BSC01MIBDSC01L

Titlepaper:GeneralMicrobiologylab

1. Microbiologicallaboratorystandardsandsafetyprotocols.
2. StandardasepticconditionsofMicrobiologicallaboratory.
3. OperationandworkingprinciplesofLight/Compoundmicroscope.
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. Demonstrationofbacterialmotilitybyhangingdropmethod.
8. Simplestaining.
9. Differentialstaining-Gramstaining.
10. Acidfaststaining.
11. Structuralstaining- FlagellaandCapsule.
12. Bacterialendosporestaining.
13. Stainingofreservedfoodmaterials.
14. StainingoffungibyLactophenolcottonblue.
15. Negativestaining.

****Any two experiments given in theexaminations as majorand minor carries20 + 15 marks**

References

1. Prescott,Harley,Klein‟s Microbiology, J.M.Willey,L.M.Sherwood, C.J.Woolverton,7thInternational,edition2008,McGrawHill.
2. Foundations in Microbiology, K. P. Talaro, 7th International edition 2009, McGraw Hill.
3. A Textbook of Microbiology, R. C. Dubeyand 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. JohnWileyand 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 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
Titleofthepaper:MicrobialTechnologyforHumanWelfare

	42Hrs
Unit–1:FoodandFermentationMicrobialTechnology	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 MicrobialTechnology	14Hrs
Microbial Fertilizers, Microbial Pesticides, Mushroom Cultivation, Biogas Production	
Unit–3:PharmaceuticalMicrobialTechnology	14Hrs
Microbial Drugs – Types and Development of DrugResistance Antibiotics – Types, Functions and Antibiotic TherapyVaccines – Types, Properties, Functions and Schedules	

Semester-II:BScMicrobiology (Basic/Hons)
Course code: 126BSC02MIBDSC02T
Papertitle:MicrobialBiochemistryandPhysiology

MicrobialBiochemistryandPhysiology	56Hrs
Unit-1BiochemicalConcepts	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, hydrogenionconcentration,pH,buffersandphysiologicalbuffersystem, Handerson–Hasselbatchequation.	
Unit-2Macromolecules–Types,StructureandProperties	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 andimportanceoflipids.PorphyrinsandVitamins:Definition,structure, propertiesandimportanceofchlorophyll,cytochromeandhemoglobin.	
Unit –3MicrobialPhysiology	14Hrs
MicrobialGrowth:Definitionofgrowth,Mathematicalexpression,Growthcurve, phases of growth, calculation of generation time and specific growth rate. Synchronous growth, Continuous growth (chemostat and turbidostat), Diauxic growth. Measurementof 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 growth. Microbial growth in natural environments. viable non-culturable organisms. Quorum sensing. Microbial Nutrition: Microbial nutrients, Classification of organisms based on carbon source, energysource and electron source, Macro and micronutrients.	
Unit –4: MicrobialPhysiology-Bioenergetics,MicrobialRespiration,Microbial Photosynthesis	14Hrs
Bioenergetics:Freeenergy,Enthalpy,Entropy,Classificationofhighenergy compounds, Oxidation reduction reactions, equilibrium constant, Redox potential, Lawof thermodynamics. Microbial Respiration: Respiratory electron transport chain in bacteria, oxidation – reduction reactions, protein translocation, oxidative and substrate levelphosphorylation–inhibitorsandmechanism,chemiosmoticcoupling. Fermentationreactions(homoandhetero)MicrobialPhotosynthesis:Lightreaction: Light harvesting pigments Photophosphorylation, CO2 fixation pathways: Calvin cycle, CODH pathway, Reductive TCA pathway.	

Microbiology lab contents –Semester-2
Course code: 126BSC02MIBDSC02L
Titlepaper:MicrobialBiochemistryandPhysiology

1. PreparationofSolution:NormalandMolarsolutions
2. CalibrationofpHmeteranddeterminationofpHofnaturalsamples
3. PreparationofBufferSolutions
4. Qualitativedeterminationand identificationofCarbohydrates
5. QualitativedeterminationandidentificationofProteins
6. QualitativedeterminationandidentificationofAminoAcids
7. Qualitative determinationandidentificationofFattyAcids
8. QuantitativeestimationofReducingSugarbyDNSmethod
9. QuantitativeestimationofProteinsbyBiuretandLowry"smethod
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. EffectofpH,temperatureandSaltconcentrationon bacterialgrowth
13. EffectofSaltconcentrationonbacterialgrowth
14. EffectofTemperatureonbacterialgrowth
15. Demonstrationofaerobicandanaerobicrespirationinmicrobes

****Anytwoexperimentsgivenintheexaminationsasmajor andminorcarries20+15marks**

References

1. FelixFranks,1993;ProteinBiotechnology,HumanaPress,NewJersey.
2. StryerL,1995;Biochemistry,FreemanandCompany,NewYork.
3. Voet&Voet,1995;Biochemistry,JohnWileyandSons,NewYork.
4. Nelson andCox,2000;LehningerPrinciplesofBiochemistry,ElsevierPubl.
5. Harper,1999;Biochemistry,McGrawHill,NewYork.
6. Palmer T. (2001), Biochemistry, Biotechnology and Clinical Chemistry, Harwood Publication, Chichester.
7. BoyerR.(2002),ConceptsinBiochemistry2nd Edition,Brook/Cole,Australia.
8. MoatA. G.,FosterJ.W.Spector. (2004),MicrobialPhysiology4th EditionPanamaBook Distributors.
9. Caldwell,D.R.(1995)–MicrobialPhysiologyandMetabolism.BrownPublishers.
10. LodishH,T.Baltimore,A.BerckB.L.Zipursky,P.MastsydaireandJ.Darnell.(2004)–Molecular Cell Biology, Scientific American Books, Inc. Newyork.

Open elective-Microbiology(OEC2)

Course code: 126BSC02MIBOEC02T

Title ofthepaper:EnvironmentalandSanitaryMicrobiology

	42Hrs
Unit–1:SoilandAirMicrobiology	14Hrs
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 ofbeneficial microorganisms in soil, Major types of harmful microorganisms in soil	
Unit–2:WaterMicrobiology	14Hrs
Wateras amajor component ofenvironment. Types, properties and uses of water. Microorganisms of different water bodies, Standard qualities of drinking water	
Unit–3:SanitaryMicrobiology	14Hrs
Publichealthhygieneandcommunicablediseases.Surveyandsurveillanceof microbialinfections. Airborne microbial infections, waterborne microbial infections,Foodbornemicrobialinfections.Epidemiologyofmicrobial infections, their detection and control.	

TextBooks/References

1. Prescott, Harley,Klein‟sMicrobiology, J.M. Willey,L.M. Sherwood, C.J. Woolverton,7th International, edition 2008, McGraw Hill.
2. Foundations in Microbiology,K.P.Talaro,7thInternationaledition2009,McGrawHill.
3. ATextbookofMicrobiology,R.C.DubeyandD.K.Maheshwari,1stedition,1999,S. Chand & Company Ltd.
4. BrockBiologyof Microorganisms,M.T.Madigan, J.M.Martinko, P. V. Dunlap, D. P. Clark- 12th edition, PearsonInternational edition 2009, Pearson Benjamin Cummings.
5. Microbiology– An Introduction, G. J.Tortora, B. R.Funke, C. L. Case, 10th ed. 2008,Pearson Education.
6. GeneralMicrobiology,Stanier,Ingrahametal,4thand5thedition1987,Macmillan education limited.
7. Microbiology- Concepts and Applications, PelczarJr,Chan, Krieg, International ed, McGrawHill.
8. Alexopoulos,C.J.,Mims,C.W.,andBlackwell,M.2002. Introductory Mycology. John Wileyand Sons (Asia) Pvt. Ltd. Singapore. 869 pp.

Pedagogy:

The generalpedagogytobefollowedfortheoryandpracticalsareasunder.

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.

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

COMPUTERSCIENCE

FIRSTANDSECONDSEMESTERSYLLABUS

Asper NEP 2020 and adapted fromRCU Belagavi

Applicable from the

AcademicYear2023-24

COMPUTERSCIENCE

CurricularandCreditsStructureunderChoiceBasedCreditSystem[CBCS]ofComputerScienceMajor&OneMinorDisciplineScheme fortheThreeyear/FourYearsB.Sc./B.Sc.HonorsProgramme witheffectfrom2023-24

SEMESTER-I										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration of exams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC1	**126BSC01CSCDSC91T**	ComputerFundamentalsand Programming in C	40	60	100	4	-	-	4	2
	126BSC01CSCDSC01L	CProgrammingLab	25	25	50	-	-	4	2	3
OEC 1	126BSC01CSCOEC01T	CProgrammingConcepts	40	60	100	3	-	-	3	2

SEMESTER-II										
Category	**Coursecode**	**TitleofthePaper**	**Marks**			**Teaching hours/week**			**Credit**	**Duration ofexams (Hrs)**
			IA	**SEE**	**Total**	**L**	**T**	**P**		
DSC2	**126BSC02CSCDSC02T**	DataStructuresusingC	40	60	100	4	-	-	4	2
	126BSC02CSCDSC02L	DatastructuresLab	25	25	50	-	-	4	2	3
OEC2	126BSC02CSCOEC02T	WebDesigning	40	60	100	3	-	-	3	2

ASSESSMENTMETHODS

EvaluationSchemeforInternalAssessment:

Theory:

AssessmentCriteria	**40marks**
1st Internal Assessment Test for30 marks 1 hr after 8 weeks and 2nd InternalAssessment Test for 30 marks 1 hr after 15weeks. Average of two tests should be considered.	30
Assignment	10
Total	**40**

AssessmentCriteria	**25marks**
1st InternalAssessmentTestfor20marks1hrafter8weeksand2nd InternalAssessment Test for 20marks1hr after15weeks. Average of two tests should be considered.	20
Assignment	05
Total	**25**

Practical:

AssessmentCriteria	**25marks**
Semester EndInternalAssessmentTestfor20marks2 hrs	20
Journal(PracticalRecord)	05
Total	**25**

QuestionPaperPattern:

ComputerScience

BSc(ComputerScience)

Sub: Code: Maximum Marks:60

a. Answer any Six Questionsfrom Question 1 b.AnsweranyThree each Questionsfrom Question 2,3,4 and 5

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

SemesterI

Year	I	**CourseCode:126BSC01CSCDSC91T**	**Credits**	04
Sem.	1	**CourseTitle:**ComputerFundamentals andProgramminginC	**Hours**	52

CoursePre-requisites,ifany	NA	
Formative Assessment Marks: 40	SummativeAssessmentMarks:60	Duration of ESA:.02 hrs.

Course Outcomes	After completingthiscoursesatisfactorily,astudentwillbeableto: • Confidently operate Desktop Computers to carry out computational tasks • Understand working of Hardware and Software and the importance of operating systems • Understand programming languages, number systems, peripheraldevices, networking, multimedia and internet concepts • Read, understand and trace the execution of programs written in C language • WritetheCcodeforagivenproblem • Performinputandoutputoperations usingprogramsin C • Writeprogramsthatperformoperationsonarrays

UnitNo.	**CourseContent**	**Hours**
UnitI	**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, conversionfrom one number system to another; Computer Codes – BCD, Gray Code, ASCII andUnicode; BooleanAlgebra –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 FeaturesofC; Structureofa C Program with Examples;Creating and Executing a C Program; Compilation process in C.	13
UnitII	**C Programming Basic Concepts**: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types;Declaration & initialization of variables; Symbolic constants. **Input and output with C**: Formatted I/O functions - printf andscanf, control stings and escape sequences, output specificationswithprintffunctions;UnformattedI/Ofunctionstoreadand displaysinglecharacterandastring-getchar,putchar,getsand	13

	puts functions. **C Operators & Expressions**: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator PrecedenceandAssociatively; Evaluation of arithmetic expressions; Type conversion.	
UnitIII	**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 Exitcontrolled 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
UnitIV	**Pointers in C:** Understandingpointers - Declaringand initializingpointers,accessingaddress andvalueofvariablesusingpointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers; **User Defined Functions:** Need for user defined functions; Formatof 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 members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.	13
RecommendedLeaningResources		
Print Resources	**Text Books** 1. PradeepK. Sinhaand PritiSinha:Computer Fundamentals(Sixth Edition), BPBPublication 2. E.Balgurusamy:ProgramminginANSIC(TMH) **References** 1. Kamthane:ProgrammingwithANSIandTURBOC(PearsonEducation) 2. V.Rajaraman:ProgramminginC (PHI–EEE) 3. S.ByronGottfried:Programmingwith C(TMH) 4. Kernighan&Ritche:TheC Programming Language(PHI) 5. YashwantKanitkar:LetusC	

Year	I	CourseCode:126BSC01CSCDSC01L	Credits	02
Sem.	I	CourseTitle:CProgrammingLab	Hours	45
CoursePre-requisites,ifany:		KnowledgeofProgramming		
FormativeAssessmentMarks:25		SummativeAssessmentMarks:25	DurationofESA:03hrs.	

PracticeLabs

1. The followingactivities be carriedout/ discussed in the lab duringthe initial periodof the semester.
    1. BasicComputerProficiency
        a. FamiliarizationofComputerHardwareParts
        b. BasicComputerOperationsandMaintenance.
        c. Do'sandDon'ts,SafetyGuidelinesinComputerLab
    2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) withExamples.
    3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

PartA:

1. WriteaCProgramtoreadradiusofacircleandtofindareaandcircumference
2. WriteaCProgramtoreadthreenumbersandfindthebiggestof three
3. WriteaCProgramtodemonstratelibrary functionsinmath.h
4. WriteaCProgram tocheckforprime
5. Writea CProgram togeneratenprimes
6. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
7. Writea C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
8. Write a C Program to read percentage of marks and to display appropriate message (Demonstration of else-ifladder)
9. Write a C Program to find the roots of quadratic equation (demonstration of switch-case statement)
10. WriteaCprogramtoreadmarksscoredbynstudentsandfindtheaverageofmarks (Demonstration of single dimensional array
11. WriteaCProgram toremoveDuplicate Elementina single dimensionalArray
12. Programtoperformadditionandsubtractionof Matrices

PARTB:

1. WriteaCProgramtofindthelengthofastringwithoutusingbuiltin function
2. WriteaCProgram todemonstratestringfunctions.
3. WriteaCProgramtodemonstratepointersinC
4. WriteaCProgramtocheckanumberforprimebydefiningisprime()function
5. Writea CProgramtoread,displayandtofindthetraceofa squarematrix
6. WriteaCProgram toread, displayandaddtwomxnmatrices usingfunctions

	7. WriteaCProgramtoread,displayandmultiplytwomxnmatrices usingfunctions 8. WriteaCProgramtoreadastringandtofindthenumberofalphabets, digits, vowels, consonants, spaces and special characters. 9. WriteaCProgramtoReverseaStringusingPointer 10. WriteaC ProgramtoSwapTwoNumbersusingPointers 11. WriteaCProgramtodemonstratestudentstructuretoread&display records of n students. 12. WriteaCProgramtodemonstratethedifferencebetweenstructure&union.

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

EvaluationSchemeforLabExamination

AssessmentCriteria		**Marks**
Activity–1fromPartA	Writeupontheactivity/task	3
	Demonstrationoftheactivity/ task	07
Activity-2fromPartB	Writeupontheactivity/task	3
	Demonstrationoftheactivity/ task	07
VivabasedonLabActivities		05
Total		**25**

OPEN-ELECTIVESYLLABUS:

Year	I	**CourseCode:126BSC01CSCOEC01T**	**Credits**	03
Sem.	1	**CourseTitle:**C Programming Concepts	**Hours**	30
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60	DurationofESA:.02hrs.	
Course Outcomes		Attheendofthecoursethestudentshouldbeableto: 1. Read,understandand tracetheexecutionofprograms writteninClanguage 2. WritetheCcodeforagivenproblem 3. PerforminputandoutputoperationsusingprogramsinC 4. Writeprogramsthatperformoperationsonarrays 5. Writeuserdefinedfunctionstoperformatask		

UnitNo.	**CourseContent**	**Hours**
UnitI	**Introduction to C Programming:** Overview of C; History and Features of C; Structure of a C Program with Examples; Creatingand Executing a C Program; Compilation process in C. **C Programming Basic Concepts:** C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.	10
UnitII	**Input and output with C:** FormattedI/Ofunctions– printfandscanf, control stings and escape sequences, output specifications with printffunctions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions **C Operators & Expressions:** Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator;Specialoperators;OperatorPrecedenceandAssociatively; Evaluation of arithmetic expressions; Type conversion. **Control Structures:** Decision making Statements - Simple if, if_else, nested if_else, else_if ladder,Switch Case, goto, break &continue statements	10
UnitIII	Looping Statements - Entry controlled and exit controlledstatements, while, do-while, for loops, Nested loops. **Derived data types in C:** 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	10

UnitIV	**User Defined Functions:** Need for user defined functions; Format of C user defined functions; Components of user defined functions -returntype,name,parameterlist,functionbody, returnstatementandfunctioncall;Categoriesofuserdefined functions - With and without parameters and return type.	10
RecommendedLeaningResources		
Print Resources	**Text Books:** 1. C:TheCompleteReference,ByHerbertSchildt. 2. CProgrammingLanguage,ByBrain W.Kernighan 3. Kernighan&Ritchie:TheCProgrammingLanguage(PHI) **References** 1. E.Balaguruswamy:ProgramminginANSIC(TMH) 2. Kamthane:ProgrammingwithANSI andTURBOC(PearsonEducation) 3. V.Rajaraman:ProgramminginC(PHI–EEE) 4. S.ByronGottfried:Programmingwith C(TMH) 5. YashwantKanitkar:LetusC	

Semester:II

Year	I	CourseCode:126BSC02CSCDSC02T	Credits	04
Sem.	2	Course Title:DataStructuresusingC	Hours	52

CoursePre-requisites,ifany	NA	
Formative Assessment Marks: 40	SummativeAssessmentMarks:60	DurationofESA:02 hrs.

Course Outcomes	After completingthiscoursesatisfactorily,astudentwill beableto: • Describe how arrays, records, linked structures, stacks, queues, trees, and graphs arerepresented in memoryand used by algorithms • Describe commonapplicationsfor arrays, records, linked structures, stacks, queues, trees, and graphs • Writeprogramsthat use arrays, records, linked structures, stacks, queues, trees, and graphs • Demonstrate differentmethodsfor traversingtrees • Comparealternativeimplementations ofdata structures with respect to performance • Describetheconceptofrecursion, giveexamplesofitsuse • Discuss thecomputational efficiency of the principal algorithmsfor sorting and searching

UnitNo.	CourseContent	Hours
UnitI	Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures.AlgorithmSpecification,PerformanceAnalysis, PerformanceMeasurement Recursion: Definition; Types of recursions; Recursion Technique Examples - Fibonacci numbers,GCD, Binomial coefficient ${}^{n}C_{r}$, Towers of Hanoi; Comparison between iterative and recursive functions. Arrays: Basic Concepts – Definition,Declaration,Initialization, Operationsonarrays;Typesofarrays;Arraysasabstract data types (ADT); Representation of Linear Arrays in memory;	13
UnitII	Traversing linear arrays; Inserting and deleting elements; Sorting– Selectionsort, Bubblesort,Quick sort, Selection sort, Insertion sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Stacks:BasicConcepts– DefinitionandRepresentationofstacks;Operationsonstacks;Application sofstacks;Infix,postfixandprefixnotations;Conversionfrominfix	13

	topostfixusingstack;Evaluationofpostfixexpressionusingstack;	
UnitIII	Queues:BasicConcepts–DefinitionandRepresentationofqueues; Typesofqueues-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 - Singlylinkedlist,Doublylikedlist,Headerlikedlist,Circularlinked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection	13
UnitIV	Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degreeof 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; Reconstructionofabinarytreewhenanytwoofthetraversalsare given.	13
RecommendedLeaningResources		
Print Resources	**ReferenceBooks:** 1. EllisHorowitzandSartajSahni:FundamentalsofDataStructures 2. Tanenbaum:DatastructuresusingC(PearsonEducation) 3. Kamathane:IntroductiontoDatastructures(PearsonEducation) 4. Y. Kanitkar:DataStructuresUsingC(BPB) 5. Kottur:DataStructureUsingC 6. PadmaReddy:DataStructureUsingC 7. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education,2007)	

Year	I	CourseCode:126BSC02CSCDSC02L	Credits	02
Sem.	II	Course Title:DataStructureLab	Hours	45

CoursePre-requisites,ifany:	KnowledgeofProgramming	
FormativeAssessmentMarks:25	SummativeAssessmentMarks:25	DurationofESA:03hrs.

PartA:

1. WriteaCProgramtofindGCDusingrecursivefunction
2. WriteaCProgramtodisplayPascalTriangleusingbinomialfunction
3. Writea CProgramtogeneratenFibonaccinumbersusing recursivefunction.
4. WriteaCProgramtoimplementTowersofHanoi.
5. Write a C Programto implement dynamic array, find smallest and largest element of the array.
6. WriteaCProgram tocreatetwo filestostoreevenandoddnumbers.
7. WriteaCProgram tocreateafiletostorestudentrecords.
8. WriteaCProgramtoreadthenamesofcitiesandarrangethem alphabetically.
9. WriteaCProgramtosortthegivenlistusingselection sorttechnique.
10. WriteaCProgramtosort thegivenlistusingbubblesorttechnique.

PARTB:

1. WriteaCProgramtosortthegivenlist usinginsertionsorttechnique.
2. Writea CProgramtosortthegivenlistusingquicksorttechnique.
3. WriteaCProgramtosortthegivenlistusingmergesorttechnique.
4. Writea C Programto search anelementusinglinearsearchtechnique.
5. Writea CProgram tosearchanelementusingrecursivebinarysearchtechnique.
6. Writea CProgramtoimplementStack.
7. WriteaCProgramtoconvertaninfixexpressionto postfix.
8. WriteaCProgramtoimplementsimplequeue.
9. Writea CProgramtoimplement linearlinkedlist.
10. WriteaCProgramtodisplaytraversalofatree.

EvaluationSchemeforLabExamination

AssessmentCriteria		Marks
Activity–1fromPartA	Writeupontheactivity/task	3
	Demonstrationoftheactivity/ task	07
Activity-2fromPartB	Writeupontheactivity/task	3
	Demonstrationoftheactivity/ task	07
VivabasedonLabActivities		05
Total		**25**

OPEN-ELECTIVESYLLABUS:

<table>
<tr><td>Year</td><td>I</td><td colspan="3" rowspan="2">CourseCode:126BSC02CSCOEC02T
Course Title:WebDesigning</td><td>Credits</td><td>03</td></tr>
<tr><td>Sem.</td><td>II</td><td>Hours</td><td>30</td></tr>
<tr><td colspan="2">CoursePre-requisites,ifany</td><td colspan="5">NA</td></tr>
<tr><td colspan="2">FormativeAssessmentMarks:40</td><td colspan="2">SummativeAssessmentMarks:60</td><td colspan="3">DurationofESA:.02hrs.</td></tr>
<tr><td>Course Outcomes</td><td colspan="6">Attheendofthecoursethestudentshouldbeableto:
1. Read,understandand tracetheexecutionofprograms
2. Writethecodeforagivenproblem
3. Performinputandoutputoperationsusingprograms
4. Writeuserdefinedfunctionstoperform atask</td></tr>
<tr><td>UnitNo.</td><td colspan="5">CourseContent</td><td>Hours</td></tr>
<tr><td>UnitI</td><td colspan="5">Historyof Internet, TheWorld WideWeb, Web Browser, Web Server, URL, Working of Web, Web Page, Types of Web Pages, WebContent, Websites, Home Pages, Building Website, Website building tools;
Webgraphics design, basic tips for graphics design, Web Designing tools: Gimp-image resize, crop, edit background, save with different file types. Introduction to web programming: what is web programming? , web programming languages.</td><td>10</td></tr>
<tr><td>UnitII</td><td colspan="5">Introduction to XHTML- Basic Syntax, Standard structure, Basic text markup,Images,Hypertext,Links,Lists,Tables,Forms-
<form>,<input>,<label>,<select>,<textarea> tags and action buttons(submit and reset). CSS- Introduction, Levels of style sheets, Selectorforms,Propertyvalueforms, Fontproperties,List properties, Color, Alignment of text, The box model, Background images, The and tags.</td><td>10</td></tr>
<tr><td>UnitIII</td><td colspan="5">JavaScript: Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screenoutput and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions; Errorsin scripts; Examples.</td><td>10</td></tr>
<tr><td>UnitIV</td><td colspan="5">IntroductiontoXML,SyntaxofXML,XMLdocumentstructure,
Displaying raw XML documents, Displaying XML documents with CSS,XSLT Stylesheets and Displaying XML documents with XSLT.
Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation</td><td>10</td></tr>
</table>

RecommendedLeaningResources	
Print Resources	**Text Books:** **1.** Robert W. Sebestra, "Programming the World Wide Web", 7th Edition /4th edition Addison Wesley Publication,2013. **References:** 1. DevelopingWeb Applications,Ralph Moseley and M. T.Savaliya, Wiley-India 2. WebTechnologies,BlackBook,dreamtech Press 3. HTML5,BlackBook,dreamtech Press 4. WebDesign,JoelSklar,CengageLearning 5. DevelopingWebApplicationsinPHPandAJAX,Harwani,McGrawHill 6. InternetandWorldWideWeb How to program, P.J. Deitel&H.M. Deitel, Pearson

BAGALKOTUNIVERSITY

MUDHOLROAD,JAMKHANDI-587301

DIST:BAGALKOTE

GEOGRAPHY

(B.Sc/B.A)

FIRSTANDSECONDSEMESTERSYLLABUS

As per NEP2020 andadapted fromRCU Belagavi

Applicable from the

AcademicYear2023-24

QuestionPaperPatternforTheory

DepartmentofGeography

Sub: **Code:**

MaximumMarks:60 **Duration:3hours**

Instructions:

AnswerthequestionsfromeverySectioni.e.A,B,C,D,andE

SectionA	Answerany**Five**Questionsoutofsixquestions	2X5=10Marks
SectionB	Answerany**Four**Questionsoutof**Six**questions	5X4=20Marks
SectionC	Answer any **Three** Questions out of **Five** questions 10 marks Each	10X3=30Marks
	Total	**60Marks**

QuestionPaperPatternforPractical

DepartmentofGeography

Sub: **Code:**

MaximumMarks:25 **Duration:3hours**

Instructions:

Answerallthesections

SectionA	Answerany**Two**Questionsoutof**Four**questions	4X2=8Marks
SectionB	Answer any**Two**Questionsoutof**Four**questions	5X2= 10Marks
SectionC	Answer any**One**QuestionoutofThree**questions	7X1=7Marks
	Total	**25Marks**

ProposedCurricularandCreditsStructureunderChoiceBasedCreditSystem[CBCS]ofGeographyDisciplineSchemefortheThreeYears/FourYears GeographyB.A./B.Sc.

UndergraduateHonorsProgrammewitheffectfrom2023-24

B.Sc.SEMESTER-I										
DSC1	**126BSC01GEGDSC91T**	PrinciplesofGeomorphology	40	60	100	4	-	-	4	2
	126BSC01GEGDSC01L	TopographicalAnalysis	25	25	50	-	-	4	2	3
OE (Any one)	**126BSC01GEGOEC01T**	EarthSystemDynamics	40	60	100	3	-	-	3	2
	126BSC01GEGOEC02T	IntroductiontoNaturalResources								
	126BSC01GEGOEC03T	IntroductiontoPhysicalGeography								
	126BSC01GEGOEC04T	FundamentalsofRemoteSensing								
				TotalMarks	**700**	**SemesterCredits**			**25**	

B.Sc.SEMESTER-II

Category	Coursecode	TitleofthePaper	Marks			Teaching hours/week			Credit	Durationof exams(Hrs)
			IA	SEE	Total	L	T	P		
DSC2	**126BSC02GEGDSC02T**	Introductionto Climatology	40	60	100	4	-	-	4	2
	126BSC02GEGDSC02L	WeatherAnalysis	25	25	50	-	-	4	2	3
OE2 (Any one)	**126BSC02GEGOEC01T**	IntroductiontoHumanGeography	40	60	100	3	-	-	3	3
	126BSC02GEGOEC02T	FundamentalsofNaturalDisasters								
	126BSC02GEGOEC03T	Climatechange:Vulnerabilityand Adaptation								
	126BSC02GEGOEC04T	BasicsofGIS								
			TotalMarks		**700**	**SemesterCredits**			**25**	

B.Sc.Semester1
THEORY

TitleoftheCourse: Principlesof Geomorphology **Code:126BSC01GEGDSC91T**

Number of TheoryCredits	Numberoflecture hours/semester	NumberofTheoryClassesperweek
4	**56hrs**	**4hrs**

CourseOutcomes:

1. Afterthecompletionofthiscourse,studentsshouldbeable to:
2. Define thefieldofGeomorphologyandtoexplain theessentialprinciplesofit.
3. tooutlinethemechanismofdynamicnatureofthe Earth'ssurfaceandinteriorof theEarth.
4. toillustrateandexplaintheforcesaffectingthecrust oftheearthanditseffectonit.
5. tounderstandtheconceptualanddynamicaspectsoflandformdevelopment

CourseObjectives:
Thiscourseaimsto:

1. TodefinetheconceptsinGeomorphologyandPhysicalGeography
2. TointroducevariousconcepttounderstandcyclesofthesolidEarthsurface
3. TounderstandthedynamicnatureoftheEarth'ssurface,variousprocesses, andlandforms.
4. Tostudytheimpacthumanongeomorphicsstem.

ContentofTheoryCourse1	56Hrs.
Unit—1Geomorphology	10
IntroductiontoGeography:PhysicalandHumanGeography IntroductiontoGeomorphology:Meaning, Nature,Development,andScope Principles of Geomorphology, Geological Time Scale Distributionofcontinentsandoceans basins	
Unit—2SystemsandCyclesoftheSolidEarth	15
Internalstructure oftheearth,Alfred Wegener'scontinental drift,Conceptof Isostasy HomlesConvectional current theory, Theoryof PlateTectonics:plate boundaries, subduction, concept of sea floor spreading, Vulcanicity andearthquake CaseStudies:Volcano, Earthquake:reportingoflatestincidents	
Unit—3 TheDynamicsofEarth	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,androckcycle, Weathering:meaning,typesandcontrollingfactors MassMovement:meaning,controllingfactors,types-landslides,rock-falls	
Unit—4EvolutionofLandforms	16

EvolutionofLandforms Landforms:meaning,typesandfactorscontrollinglandformsdevelopment Slope development: Concept and types Conceptof CycleofErosion—W.M.Davis Agentsof Denudation:River;Groundwater,Seawaves,Windand Glaciers and resultantlandforms. Application of geomorphology: in India and Karnataka (Regional planning, Urbanplanningandtransportation,Mining,Hazardmanagement,Agriculture and Environmental management).	

Textbooks

1.Ahmed E.(1985)Geomorphology,KalyaniPublishers,NewDelhi.

2. PMallappa,PhysicalGeography(KannadaVersion)
3. RanganathPrinciplesofPhysicalGeography(KannadaVersion)
4. NanjannavarSS:PhysicalGeography(KannadaVersion)
5. HugarMRPhysicalGeographypart1 (Kannada Version)
6. GoudarMB,PhysicalGeography (KannadaVersion)
7. KolhapureandSSNanjan,PhysicalGeography(KannadaVersion)

References

1.BloomA.L.(1978) Geomorphology:ASystematic Analysisof LateCenozoic Landforms Prentice — Hall of India, New Delhi.

2. BrunsdenD.(1985)GeomorphologyintheService ofMan:TheFuture of Geography, Methnen,U.K.
3. Chorley,R.J.,Schumm,S.A.andSugden,D.E.1984:Geomorphology,Methuen,London
4. Cooke,R.U.andWarren,1973:GeomorphologyinDeserts,Batsford,London
5. Dayal,P.1996:TextbookofGeomorphology,ShuklaBookDepot,Patna.
6. GoudieAnrewet.al.(1981)GeomorphologicalTechniques,GeorgeAllen&Unwin,London.
7. Homes A.(1965)PrinciplesofPhysicalGeology,3rdEdition,ELBSSEdn.
8. StrahlerA.N.(1968)TheEarthSciences,Harper&Row Intl.Edn,NewYork
9. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, WileyIntl. Edn. & Wiley,1984.
10. Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Develop- ment, Elsevier, Amsterdam.

ReferenceWebsites

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

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Casestudy	30%
Assignment	20%
CIA	50%
Total	100%

B.Sc.Semester1

PRACTICAL

TitleoftheCourse: Topographical Analysis**Code:126BSC01GEGDSC01L**

Number ofpractical Credits	Numberof practical hours/ semesters	Numberof practicalclasses per week
2	**52hrs**	**4hrs**

ContentofPracticalCourse1	52Hrs.
Exercise-I: Identification of Rocks and Minerals: Mineral samples: Ironore,BauxiteoreandManganese,Rock Samples:Granite,Basalt,Lime Stones, Sandstone, quartzite, and marble.	6
Exercise-2: ExtractionandinterpretationofGeomorphicinformation fromTopographicalmaps	6
Exercise-3: Preparationofcontourmapfrom toposheet	6
Exercise-4: InterpretationofPhysicalfeaturesofSOIMaps(2 Exercise)	7
Exercise-5: InterpretationofCulturalfeaturesofSOIMaps(2Exercise)	7
Exercise6: Interpretationofrelationship betweenphysicalandcultural features (1 Exercise)	8
FieldWork: Identificationofphysicalandculturalfeaturesoflocalarea.	6
CaseStudy:studentsmustbetakentoobservelocallandformationand degradationandwriteareportontheireffectiveness.	6

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Casestudy	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-1
THEORY

TitleoftheCourse: EarthSystemDynamics **Code:**126BSC01GEGOEC01T

Numberof TheoryCredits	**Numberoflecture hours/ semester**	**NumberofTheoryclassesperweek Numberofpracticalhours/semesters**
3	**56hrs**	**3hrs**

Course Outcomes:

1. This course is to make understand the basic concepts of earth and to impart necessaryskillsofearthsystem,anddynamicstothestudents.Sothat,students acquire basic understanding of the mother earth
2. Toarticulatethesynergiesandtrade-offsof earthsystem andinterconnected subs stems to the students of interdisciplinary students.

CourseObjectives

Thiscourse aimsto

1. Understandtheconcepts inEarthSciences
2. Tostudythe globalissuesinthe Earthsystem
3. Tostudapplicationofgeoinformaticstosolvethedisasterandhazards

ContentofTheoryCourse	56Hrs
Unit—1 EarthSystemDynamics	10
Originof 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—2IssuesinEarthSystem	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—3ClimateChange	14
The physical science of climate system and change, concepts, causes, effects, measures, climate change; Land — Climate interactions and climatic zones of worldandIndia;Climatechangeandlinkageswithenergy,emergingdiseases, communityresponse.	
Unit—4GeoinformaticsApplications: Conceptsofhazards,risksandvulnerability;theiranalysisrelatingclimate projectionsandtheiruncertainties;globalwarming,floodsanddroughts,and weather variations,ecosystemschanges,andsnow/glaciersmelting, energy studies, health and diseases studies and other case studies.	14

References

1. TheDynamicEarthSystem(2012),PrenticeHallIndiaLearningPrivateLimited; Third edition(2012)A.M.Patwardhan
2. Earth'sDynamic Systems (2003), Pearson;10th edition(2003),W. Kenneth Hamblin& Eric H. Christiansen
3. PlanetEarth:Cosmology,Geology,andtheEvolution ofLifeandEnvironment (1992) Cesare Emiliani
4. Earth:EvolutionofaHabitableWorld,2nd edn., Cambridge,UK:CambridgeUniversity Press(2013)Jonathanl.Lunine.
5. Evolution ofthe Earth,McGraw-HillEducation;8thedition(2009)Donald Prothero, Robert Dott, Jr.
6. ATextbookofClimatology,WisdomPress(2015)TapasBhattacharya

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Casestudies	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-2
THEORY

TitleoftheCourse: Introduction to Natural Resources **Code:**126BSC01GEGOEC02T

Number of TheoryCredits	Numberoflecturehours/ semester	Numberoflecturehours/week
3	**42hrs**	**3hrs**

CourseOutcomes:Attheendofthecoursethestudentswill:

1. Understand concepts of different natural resources, its use, overuse, with its solution by natural resource management methods.
2. Appreciate theneedformanaginglandandwaterresourcesforsustainablegrowth anddevelopment,managerialskillssuchaslandevaluationandlandclassification.
3. Also, able to understand the causes and consequencesof water stress and draw water conservation and management plans.

CourseObjectives:Thiscourseaimsto

1. Explainthetypesofnaturalresources thatexist.
2. Studytheroleofgovernment anddifferentagenciesinthenaturalresource management
3. Studthethreattothenaturalresourcesandthepolyciestosolveit.

ContentofTheoryCourse	42Hrs
Unit—1ConceptofResources	12
Meaning, Definition, importance and classification of Resources, Appraisal of NaturalResources,Natural ResourcesEconomics,HistoryofConservation,need for conservation and Management of Natural Resources —Role of Government and NGO Agencies, Resource Creating Factors. Environmental Risk- types, wildlife,forestriskanditsimpactonenvironmentanditsmanagement.	
Unit—2LandResources	10
LandEvaluationMethods,LandclassificationMethods,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.Soilerosion,soildegradation,methodsofconservation.	
Unit—3WaterResources	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, methodsofwaterconservation,watershedmanagement,coastalandocean Resourcesmanagement,FisheriesManagement	
Unit—4MineralsResources	10
Types of minerals, classifications of Major Minerals, their distribution and production.SuchasPetroleum, Coal,Iron ore,Bauxite and Copper etc,andits uses. Mineral exploration methods, Mining, and its effects on environment. Mineral'sconservationandminingpolicy	

References

1.Dr.Alka Gautham:Geography of Resources:Exploitation,Conservation and Mangement, Sharada Pustak Bhavan, Allahabad.

2. Dr.P.S.Negi:GeographyofResources:KedarnathRamnathPublishers,NewDelhi
3. Dr.RajashekaraShetty(2009):AnAnalysisofWorldResourceswithreferenceto India,SaralaRaj,RiaPublishers,Mysore
4. Khanna K.K and Gupta V.K.(1993): Economic and Commercial Geography, Sultan Chand, New Delhi
5. Prof.Zimmerwan—WorldResourcesandIndustries
6. Roy, P.R(2001) Economic Geography — A Study of Resources, New Central Book Agency,Calcutta.

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Casestudies	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-3
THEORY

Titleof the Course: Introduction to Physical Geography **Code:**126BSC01GEGOEC03T

NumberofTheory Credits	**Numberoflecturehours/ semester**	**Numberoflecture hours/week**
3	**42hrs**	**3hrs**

CourseOutcomes:

1. StudentswillbeabletounderstandthefundamentalconceptsinEarth Sciences
2. Understandsbasicterminologyusedtodescribephysicalprocessesand landscapeforms.
3. Describeelementsof the atmosphereandtheoceans

CourseObjectives:

Thiscourseaimsto

1. StudybasicprinciplesoftheEarthSciences
2. Understandthelandforms,atmosphericelementsandstructureand basicsofoceanography

ContentofTheoryCourse	42Hrs
Unit-1	12
Origin,ShapeandSize oftheEarth, Movement of the Earth- Rotation and Revolution, Effects of the movementofEarth,Coordinates-Latitude,LongitudeandTime. StructureoftheEarth,	
Unit—2	10
Rocks-types,significance, Weathering—types. AgentsofDenudation-River, Glacier,WindandUnderGround water.Volcanicity,EarthquakesandTsunamis	
Unit-3	10
StructureandCompositionofAtmosphere, Weather and Climate. AtmosphericTemperature,HeatBudget oftheatmosphere AtmosphericPressure,WindsandPrecipitation	
Unit—4	10
DistributionofLand and Sea,Submarine Relief of the Ocean, Temperature and Salinity of Sea Water. Ocean Tides,Waves and Deposits,Ocean currents -Atlantic,Pacific and Indian Oceans. MarineResources:Biotic,mineralandenergyresources	

References

1.B.S.Negi(1993)PhysicalGeography.S.J.Publication,Meerut
2. D.S.Lal(1998)Climatology.Chaitnyapublishinghouse,Allahabad
3. K.Siddhartha(2001)Atmosphere,WeatherandClimate. Kisalayapublication,NewDelhi
4. R.N.Tikka(2002)PhysicalGeography.KedarnathRamnath&co,Meerut
5. WillianD.Thornbury(1997)Principleof Geomorphology.New AgeInternational(Pvt Ltd.) New Delhi.

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Casestudies	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-4
THEORY

TitleoftheCourse: FundamentalsofRemoteSensing**Code:**126BSC01GEGOEC04T

Number of TheoryCredits	Numberoflecture hours/semester	Numberoflecturehours/ week
3	**42hrs**	**3hrs**

CourseOutcomes:

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.

CourseObjectives:

1. Tocongregate thebasicconceptsandfundamentalsofphysicalprinciples of remote sensing
2. Tocreatea firm basis for successful integration of remote sensing in any field of application.
3. Tostudybasics ofdigitalimageprocessingandimage interpretation techniques.
4. Tostudthe applicationsoftheremote sensingtosolvethe real-world problems.

ContentofTheoryCourse	42Hrs
Unit—IIntroduction	10
DefinitionofRemoteSensing,developmentalstages,Lawsof Physics, electromagnetic waves, spectrum, regions, wavelength, frequencies, andapplications.Types-Satellites,Sensors,Payloads,Orbits, telemetryofsatellites.	
Unit–2ProcessandtypesofRemoteSensing	12
Processof remote sensing, interaction of radiation with atmosphere andtargets,atmospheric noises,attenuation inradiance, 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—3ImageClassificationandInterpretation	10
Satellite products and its spectral characteristics, composite images, bandratios;Landuse landcover classificationschemes-Anderson and NRSC; Visual image interpretation, elements, stages of interpretation and interpretation keys. Image classification- supervised, unsupervised, and principal componentanalysis (PCA) andaccuracy assessment.	

Unit—4ApplicationsofRemoteSensing	10
Disaster Management, Meteorological Studies, Agricultural and IrrigationStudies,ForestryStudies,Hydrological Studies,Natural Resource, OceanicandCoastal mapping,Soilresourcemapping, UrbanandRuralMappingandManagement.	

References:

1. RemoteSensingoftheEnvironment:AnEarthResourcePerspective(PrenticeHall SeriesinGeographicInformationScience)–SecondEdition(2006),JohnJensen
2. RemoteSensingandGIS,SecondEdition(2011),Bhatta,B.
3. IntroductiontoRemoteSensingandImageInterpretation(2003);LillesandT.M.
4. Remotesensingandimageinterpretation(2015);Chipman,JonathanW.,Kiefer,Ralph W., Lillesand
5. IntroductiontoRemote Sensing,Fifth Edition(2011);JamesB.Campbell, RandolphH. Wynne
6. Practical handbook of remote sensing, First Edition (2016) – Lavender, Andrew, Lavender, Samantha
7. IntroductoryDigitalImage Processing:ARemote SensingPerspective, Fourth Edition (2015) – John R. Jensen
8. ImageprocessingandGISforremotesensing:techniquesandapplications;Second Edition (2016) – Liu, Jian-Guo, Mason, Philippa J

1.https://onlinecourses.nptel.ac.in/noc19e41/preview

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Casestudies	30%
Assignment	20%
CIA	50%
Total	100%

B.Sc.SemesterII

THEORY

TitleoftheCourse: IntroductiontoClimatology **Code:126BSC02GEGDSC02T**

Numberof TheoryCredits	Numberoflecture hours/semester	NumberofTheoryclasses/ week
4	56hrs	4hrs

CourseOutcomes:Afterthecompletionofthiscourse,studentsshouldbeableto

1. Definethefieldofclimatologyandtounderstandtheatmosphericcomposition andstructure.
2. To outline the mechanism and process of solar radiation transfer to earth surfaceandtoex-plainthetemperature distributionandvariationaccordingto time and space.
3. Toillustrateandexplaintheairpressuresystem,windregulatingforcesand theformationoftheAtmosphericDisturbance.
4. Tounderstandandcompute theairhumidityaswellastoexplain the process ofCondensation and formation of precipitation and its types.

CourseObjectives:Thiscourseaimsto:

1. Todefinethe fieldof climatologyandcomponentsoftheclimatesystem
2. Tointroducevariousdimensionsofclimatology likestructureandcomposition.
3. Tounderstandtheglobalatmosphericpressure,temperature,andwindsystem.
4. Tostudytheconceptofatmosphericmoistureanditstyes

ContentofTheoryCourse1	56Hrs
Unit—1CompositionandStructureoftheAtmosphere Natureand ScopeofClimatology,AtmosphericSciences;Climatology and Meteorology Originandstructure oftheAtmosphere:Troposphere,Stratosphere, Mesosphere, Ionosphere, Exosphere and their characteristics. Compositionofthe atmosphere,WeatherandClimate	10
Unit—2AtmosphericTemperature Insolation:Definition,Mechanism,Solar Constant.Factorsaffectingthe Insolation. Heating and cooling process of the atmosphere-Radiation, Conduction, convection, and advection. Temperature:meaningand InfluencingFactors onthe Distributionof Temperature Distributionofthetemperature:Vertical,Horizontal,and Inversion of temperature. GlobalEnergyBudget:Incomingshortwavesolarradiation,Outgoing LongwaveTerrestrialradiation,Albedo.NetRadiationandLatitudinal HeatBalances.	16
Unit—3AtmosphericPressureandWinds AtmosphericPressure: Influencingfactorsonatmosphericpressure. Vertical and Horizontal Distribution of the atmospheric pressure andPressure Belts, Pressure Gradient.Ferrel'sLaw Winds:influencingfactors,Types-planetary,seasonal,localwind Variable winds-Cyclones and anti-cyclones.	15

Air-MassesandFronts:Definition,Nature,SourceRegions,Classification.	
Unit—4AtmosphericMoisture Humidity:Sources,influencingfactorsandtypes-Absolute,Relative and Specific. Hydrologicalcycle:process ofevaporation,condensation.Clouds andits types Precipitation and its forms. ClimateChange:Causesandconsequences, recentissues-floods, drought,	15

Textbooks

1 Lal,D.S.(1998).Climatology.Allahabad:ChaitanyaPublishingHouse.
2 PMallappa,PhysicalGeography(KannadaVersion)
3 RanganathPrinciplesofPhysicalGeography(KannadaVersion)
4 NanjannavarSS:PhysicalGeography(Kannada Version)
5 HugarMRPhysicalGeographypart2(KannadaVersion)
6 GoudarMB,PhysicalGeography(Kannada Version)
7 KolhapureandSSNanjan,PhysicalGeography (KannadaVersion)
8 HangaragiS.S.,ClimatologyandBiogeography(Kannada Version)

References

1. Lutgens, Frederic K. & Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
2. Oliver,JohnE. & Hidore, JohnJ. (2003). Climatology: An Atmospheric Science. Delhi: PearsonEducation.
3. Singh,S.(2005).Climatology.Allahabad:PrayagPustakBhawan.
4. Barry, R.G. and Chorley, R.J. (2003): Atmosphere, Weather and Climate; PsychologyPress, Hove; East Sussex.
5. Critchfield,H.J.,(1975):generalClimatology,PrenticeHall,NewJersey.
6. Mather,J.R.(1974): Climatology: Fundamentals and Applications; Mc Craw Hill Book co.,U.S.A.
7. Rumney,G.R. (1968):ClimatologyandtheWorldClimates,Macmillan,London.

ReferenceWebsites

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

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Casestudies	30%
Assignment	20%
CIA	50%
Total	100%

B.Sc.SemesterII

PRACTICAL

TitleoftheCourse: WeatherAnalysis **Code:126BSC02GEGOEC02L**

Number ofpractical Credits	Numberofpractical hours/ semesters	Number ofpracticalhours/ week
2	52hrs	4hrs

ContentofPracticalCourse 2	52 Hrs.
ContentofPractical Course1: List ofExperimentstobeconducted Conduct all exercises with Goal, Procedure, devices, and findings.	5
Exercise1: StructureandfunctionsoftheIndianMeteorological Department (IMD).	3
Exercise2: CollectionoftemperaturedatafromIMDwebsite.	4
Exercise3: Plottingofdownloadedtemperaturedatausinggraphical methods-linegraph.	4
Exercise4: CentigradeandFahrenheitthermometer formeasuring temperature.	4
Exercise5: MercurialBarometer andAneroidBarometerformeasuring atmospheric pressure	4
Exercise6: WindVaneandcup-anemometer.	4
Exercise7: WetandDrybulb thermometerformeasuring humidity	4
Exercise8: Rainguage-Dialtypeformeasuringrainfall	4
Exercise9: RainfallTrendAnalysis(monthlyandannual)	4
Exercise10: InterpretationofIndianDailyWeathercharts.(Each oneofFour seasons) Note:Studentsareexpectedtodownloadweatherchartsofthefourseasons.	12

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	Weightagein Marks
Quiz	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-1
THEORY

TitleoftheCourse: Introduction to HumanGeography **Code:**126BSC02GEGDSC01T

Numberof Theory Credits	Numberoflecture hours/ semester	Numberoflecture hours/week
3	**42hrs**	**3hrs**

CourseOutcomes:

1. Studentswilllearnhowhuman,physical,andenvironmentalcomponentsof theworldinteract.
2. Studentswillbefamiliarizedwitheconomic processessuchasglobalization, trade and their impacts on economic, cultural and social activities.
3. Thestudentwilldescribewhatgeographyandhumangeographyare.
4. Understand populationdynamicsandmigration.

CourseObjectives:

Thiscourseaimsto

1. Understandthebasicsconceptsofhumangeography
2. Studypopulationattributesanddynamicnatureofit
3. Introduceeconomic,cultural,andtrade activitiesandtheirimpact onthe development of the region

ContentofTheoryCourse	56Hrs
Unit—1IntroductiontoHumanGeography	10
Natureandscope,Development Environmental DeterminismandPossiblism,Neodeterminism(stopandgo determinism) Approachestohumangeography:ExplorationandDescriptive approach, regional analysis Approach, Areal Differentiation Approach, Spatial organization Approach. Modern approaches: Welfare or Humanistic Approach, Radical Approach, BehavioralApproach,PostModernismingeography FieldsandsubfieldsinHumangeography	
Unit—2GeographicalAnalysisofPopulation	16
DistributionandGrowthofPopulation Density of population: meaning and Types: Arithmetic Density and PhysiologicalDensity.Regionaldistribution ofDensityof 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, EnvironmentalPushandPullFactors.MigrationTypes:Immigrationand Emigration,InternalandInternationalMigration	
Unit—3CulturalPatterns andProcesses	15

ConceptofCulture,MaterialandNonmaterialculture CulturalRegions,culturalTraitsandComplexes,culturalHearths,cultural Diffusion. Languages of the World: Types, Classification and Distribution. Language Extinction Religions:Types andClassification. Distribution.Universalizing Religions: Christianity, Islam, Buddhism. Ethnic Religions: Hinduism, the Chinesereligion,Shintoism, Judaism. The Major tribalpopulation of the world.	
Unit—4HumanEconomicActivities,DevelopmentandSettlements	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, Wholesaletrading.Transport andcommunications:Factors,communication services — Telecommunication. Services: Informal and Non formal sector. Information technology and service. Human Settlements: Factors, Classification, Types and Patterns: Rural, Urban.CompactorNucleatedandDispersedsettlements.Rural settlement Patterns: linear, rectangular, circular, star shaped, T shaped. Urbansettlements:urbanism,classification—populationsize,occupation structure,Administration.functionalclassificationofurbancentres,typesof urban settlements: towns, city, conurbation, Megalopolis, Million cities.	

References

1.Hartshorne,T.A.,& Alexander,J.W.(2010).Economic Geography.New Delhi:PHI Learning.

2. Knox,P.,Agnew,J.,&McCarthy,L.(2008).TheGeographyoftheWorldEconomy. 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: AnEconomic Geographical Analysis, New York: John Wiley and Sons.

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Quiz	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-2
THEORY

TitleoftheCourse: Fundamentals of Naturaldisasters

Code:126BSC02GEGOEC02T

Number ofTheoryCredits	**Number oflecture hours/ semester**	**Numberoflecture hours/week**
3	**42hrs**	**3hrs**

CourseOutcomes:

Studentswillbe ableto

1. Understandthe basicsconceptsinnaturaldisasters
2. Studtesofnaturaldisastersandtheireffects

CourseObjectives:

1.Thepaperisintendedtoprovideageneralconceptinthedimensionsof disasters causedbynaturebeyondthehumancontrol.
2. Introduceaholistic classification ofnaturaldisastersconsidering theEarth Sciences
3. Demonstratethedevastatingeffectofnaturaldisasterstosociety,

ContentofTheoryCourse1	42Hrs
Unit—1IntroductiontoNaturalDisaster	10
Meaning,definition,andscope. LithosphereandNaturalDisasters Earthquakesandvolcanoes,LandslidesandAvalanches	
Unit—2 AtmosphereandNaturalDisasters	10
Heatwaveandwildfire,Cloudburst,hailstorm,Droughtandfamines	
Unit–3 HydrosphereandNaturalDisaster	10
Tsunami,Hurricanesandcyclones,Floodsandflashfloods	
Unit–4Biosphere andNaturalDisasters	12
Epidemics and pandemics, Covid -19 and its effects Techniquesandtechnologytomitigatenaturaldisasters	

References

1.Dr.MrinaliniPandeyDisasterManagementWileyIndia Pvt.Ltd.

2. TusharBhattacharyaDisasterScienceandManagement McGrawHillEducation(India) Pvt.Ltd.
3. JagbirSinghDisasterManagement:FutureChallengesandOpportunitiesKW PublishersPvt.Ltd.
4. J.P.SinghalDisasterManagementLaxmiPublications.
5. ShaileshShukla,ShamnaHussain Biodiversity,Environmentand Disaster Management Unique Publications

6. C.K.Rajan,NavalePandharinathEarthandAtmosphericDisasterManagement:Natureand ManmadeBSPublication

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Quiz	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE (OE)-3
THEORY

TitleoftheCourse: ClimateChange:Vulnerabilityand Adaptation

Code:126BSC02GEGOEC03T

NumberofTheoryCredits	Numberoflecture hours/ semester	Numberoflecture hours/week
3	42hrs	3hrs

CourseOutcomes:

1. This course is to make understand the basic concepts of Climate-Weather systemsandtoimpartnecessaryskillsofClimatechange,anditsimpactonearth systems to the students. So that, students acquire basic understanding of the climate systems of the earth and to study the applications of the Geoinformatics to study the climate change.

CourseObjectives:

1. Toprovideasoundunderstandingoftheeconomicsofclimatechangefrom multipleviewpoints
2. Demonstrateknowledgeoftheprojectedimpactsofclimatechangeand potentialstrategies
3. Foralleviatingtheir negative impacts.
4. Definekeyterms(e.g.,adaptation,resilience,vulnerability, mainstreaming)
5. Study application of the Geoinformatics in the Climate Chan e and Adaptation

ContentofTheoryCourse	42Hrs
Unit—1IntroductiontoClimateChange Meaningandconceptof climatechange. Originofatmosphere.Conceptsofweatherandclimate. Evidence of Climate Change: Historical and current weather and climateevents:Meteorological,Lithogenicandbiological,Greenhouse effect, Greenhouse Gases, Global Warming. Extremeweatherandclimateevent:Drought,ExtremeHeat,Extreme precipitation, Hurricanes,TornadoesandWildfire.	10
Unit—2CausesandEffectofclimatechange Naturalcause:Solar variation,Volcaniceruption,oceancurrents,Earth orbital change and internal variability Humancauses:Burningfossilfuel, Deforestation,Intensive Agriculture, and industries. Impacts of climate change: Water resources, agriculture, human health,vegetation,economyandElnino,La NinaandArctic Oscillation International efforts to control the climate change: UNFCC its policy framework and provisions, Earth Summit Rio-de-Janeiro, World summit, Kyoto Protocol, Copenhagen summit and Doha Conference	10

Unit—3ClimatechangeVulnerabilityandAdaptation Meaningandtypeofvulnerability Meaning, Definition, and types of adaptation ApproachesofadaptationandAdaptationStrategies. Adaptationindifferentsectors:Agriculture,Forest,Waterresources, Biodiversity,DisasterRiskManagement	10
Unit—4VulnerabilityAssessmentandclimatechangemitigation Climatechangevulnerabilityassessment GlobalInitiativestoclimatechangemitigation:KyotoProtocol,carbon trading, clean development mechanism, COP. Indianinitiativetosupportclimatechangemitigation:Improving energy efficiency, Diversification of energy sources, Modifying industrial processes, a multipronged strategy for sustainable development andCleanDevelopmentMechanism(CDM) inIndia. Casestudies:MGNREGA(MahatmaGandhiNationalRuralEmployment Guarantee Act) potential of generating co-benefits, Vertical Shaft Brick Kiln (VSBK) or Ecokiln	12 16

References

1.Earth:EvolutionofaHabitableWorld,2ndedn.,Cambridge,UK:CambridgeUniversity Press(2013)Jonathanl.Lunine.

2. Evolution ofthe Earth,McGraw-HillEducation;8th edition(2009) DonaldProthero, Robert Dott, Jr.
3. ATextbookofClimatology,WisdomPress (2015)TapasBhattacharyaGlobal Warming: The Complete Briefing, Cambridge University Press; 4th edition (2009), JohnHoughton
4. K.Siddahartha (2020):Climatology, Atmosphere, Weather and Climate. Kitaba Mahal Publication, New Delhi.
5. K.Siddaharthaandothers(2014):BasicPhysicalGeographyKishalayaPublications Pvt,Publication,NewDelhi.
6. Satapathy. S: Adaptation to Climate Change with a Focus on Rural Areas and India. IndianMinistryofEnvironment andForests,DirectoroftheClimate ChangeDivision.
7. PatriciaButler,Chris Swanston,MariaJanowiak,LindaParker,MattSt.Pierre,and LeslieBrandt:AdaptationstrategiesandApproaches.
8. Ministry of Environment and Forest Government of India: Adaptation to Climate Change with a Focus on Rural Areas and India.
9. NeelamRana,AnandKumar,KavitaSyalandMustafaAliKhan:ClimateChange MitigationinIndia

WebResources

1.IEATrainingMaterial:Vulnerabilityand ClimateChangeImpactAssessment for Adaptation.

2. http://www.iisd.org/pdf/2010/iea_training_vol_2_via.pdf
3. GuidanceonIntegratingClimateChangeAdaptationintoDevelopmentCo-operation.
4. http://www.oecd.org/dac/43652123.pdf
5. MainstreamingClimateChangeAdaptation intoDevelopmentPlanning:AGuidefor

Practitioners.
6. http://www.unep.org/pdf/mainstreaming-cc-adaptation-web.pdf
7. CGEClimateChange Training Materials.
8. http://unfccc.int/national_reports/nonannex_i_natcom/training_material/methodological_documents/items/349.php
9. CompendiumonMethodsandToolstoEvaluateImpacts of,andVulnerabilityand Adaptationto,ClimateChange.
10. http://unfccc.int/adaptation/nairobi_work_programme/knowledge_resources_and_publications/items/5457.php
11. Centre for climate and Energy solutions. https://www.c2es.org/content/extremeweather-and-climate-change/
12. https://www.history.com/topics/natural-disasters-and-environment/history-of-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

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Quiz	30%
Assignment	20%
CIA	50%
Total	100%

OPEN ELECTIVE(OE)-4
THEORY

TitleoftheCourse: BasicsofGeographicInformationSystems(GIS)
Code:126BSC02GEGOEC04T

NumberofTheoryCredits	Numberoflecture hours/ semester	Numberoflecture hours/week
3	42hrs	3hrs

CourseOutcomes:

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 non-spatial data collection, data storage, data analytics, data interpretation and data display through the thematic maps.
3. Students are exposed on spatial thinking to solve thegeographical 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.

CourseObjectives:Thiscourseaimsto:

1. UnderstandtheconceptandtechniquesoftheGeographicInformationSystems.
2. DefinetheGISdatatypesand structures.
3. Studygeoprocessingandvisualizationconceptsandtechniques inGIS.

ContentofTheoryCourse	42Hrs
Unit—IIntroduction	10
Emergence of Gl Science, Milestone and Developmental stages in GIS, Definition,scope,roleofGISindigitalworld; Components,functionalities, merits and demerits, global market, interdisciplinary domains, and its integrationwithGIS.	
Unit—2GeodesyandSpatialMathematics	10
Cartesian coordinates, latitude, longitudes, formats of angular units, geographical coordinates, Datum: WGS84, vs NAD32. U TM, Aerial Distance measurementusing Geographicandprojectedcoordinates,Area,Perimeter, length by coordinates and various international measures.	
Unit-3GISDataandScale	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;precisionandaccuracyofdata-logicalconsistencyandnon-spatialdataintegration	
Unit—4GeoprocessingandVisualization	12
SpatialandNon-SpatialQueries,proximityanalysis,PreparationofTerrainand Surface models. Hotspot and density mapping. Types of maps, thematic maps andits types, relief maps, flow maps and cartograms. Tabulations:Graphs and Pivottables.	

References

1. AnIntroductiontoGeographicalInformationSystems-IanHeywood(2011)
2. Geographic Information Systems: A Management Perspective - Aronoff, S. (1989).
3. GIS-Fundamentals,Applications,andImplementations-Elangovan,K.(2006)
4. IntroductiontoGeographicalInformationSystems-Chang,Kang-Tsung(2015)
5. RemoteSensingandGIS-Bhatta,B. (2011)
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7. SpatialanalysisandLocation-AllocationModels-Ghosh,A.andG.Rushton(1987)
8. GeographicInformationSystemsandCartographicModelling-Tomlin,C.D.(1990)
9. GeographicInformationSystemsandScience-PaulA.Longley,et. al.(2015)
10. GeographicInformationSystemsandEnvironmentalModelling-Clarke,C.,K.(2002)

ReferenceWebsites

1.IIRSMOOCprogramme:https://isat.iirs.gov.in/mooc.php

Pedagogy

FormativeAssessment	
AssessmentOccasion/type	WeightageinMarks
Quiz	30%
Assignment	20%
CIA	50%
Total	100%

INTERNALASSESSMENTFORTHEORY

MaximumMarks:40

S.No.	Particulars	Details	Marks
1	TwoCasestudies	a.Introduction	
		b.Identificationofproblem	
		c.Collectionofdata/Fieldvisit/Photos	
		d.AnalysisandFindings	
		e.Suggestions/Recommendation/Conclusion	
		Total	20
2.	TwoInternalTest	(2x10) Total	20
		Grand Total	**40**

AreaofCaseStudy

Thestudentshouldcarryouttheircasestudy byselecting oneofthe belowmentioned field within the vicinity of 20 kms from their institute.

1. Agriculturalregion(rainfed/irrigated)
2. Urban area
3. Ruralarea
4. Watershedarea
5. Industrialregion
6. Forestregion
7. Population
8. Landscape
9. Tourism
10. Naturalelements
11. Globalwarming
12. Marketstudy

QuestionPaperPatternforTheory

Departmentof Geography

Sub: **Code:**

MaximumMarks:60 **Duration:2hours**

Instructions:

AnswerthequestionsfromeverySectioni.e. A,BandC

SectionA	Answerany **Ten**Questionsoutof**Twelve**questions (Minimumtwoquestionsfromeach unit)	2X10=20Marks
SectionB	Answerany**Four**Questionsoutof **Six**questions (Minimumonequestionfromeachunit)	5X4=20Marks
SectionC	Answerany**Two**Questionsoutof**Four**questions (OneQuestionfromEachUnit)	10X2=20Marks
	Total	**60Marks**

QuestionPaperPatternforPractical

DepartmentofGeography

Sub: **Code:**

MaximumMarks:25 **Duration:2hours**

Instructions:

Answerallthesections

SectionA	Answerany**Two**Questionsoutof**Four**questions	4X2 =8Marks
SectionB	Answerany**Two**Questionsoutof**Four**questions	5X2=10 Marks
SectionC	Answerany**One**Questionoutof**Three**questions	7X1 =7Marks
	Total	**25Marks**

CommonSyllabusfor

B.Sc 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. No.	Department	Category	Course Code	Title
1	Kannanda (L1)	AECC-I	126BSC01LANAEC01T	Kannada
2	Functional Kannanda(L1)	AECC-I	126BSC01LANAEC02T	FunctionalKannada
3	English(L2)	AECC-II	126BSC01LANAEC03T	English
4	Hindi(L2)	AECC-II	126COM01LANAEC03T	Hindi
5	Sanskrit(L2)	AECC-II	126COM01LANAEC04T	Sanskrit
6	Marathi (L2)	AECC-II	126COM01LACAEC05T	Marathi
7	Urdu(L2)	AECC-II	126COM01LANAEC06T	Urdu
8	Arabic(L2)	AECC-II	126COM01LANAEC07T	Arabic

DetailsofSEC-1,VBC-1,VBC-2SubjectsstudiedbyScienceStudentsinSemester-I

Sl.No.	Category	CourseCode	Title
1	**SEC1**	126COM01XXXSEC01T	DigitalFluency
2	**VBC1**	126COM01XXXVBC01B	Yoga/Sports
3	**VBC2**	126COM01XXXVBC02T	Health&Wellness

SEMESTER–I **CourseCode:126BSC01LANAEC01T**

ಬಾಗಲಕೋಟ ವಿಶ್ವವಿದ್ಯಾಲಯ

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

Bagalkot University

(A State Public University of Govt. of Karanataka)
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Tel No: (08353)295123, 295124

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ವಿಭಾಗ

ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎಸ್ಸಿ

(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 (ಸೆಮಿಸ್ಟರ್‌ನ 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 / 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
1st Semester Language-1	ಕನ್ನಡ	ಬಿ.ಎಸ್ಸಿ. ಕನ್ನಡ ಪತ್ಯಕ್ರಮವು ಕನ್ನಡ ನಾಡು–ನುಡಿ ಪ್ರಜ್ಞೆ, ಭೂಮಿ, ವೈಜ್ಞಾನಿಕ ಮನೋಧರ್ಮ ಮತ್ತು ಸಂಕೀರ್ಣಗಳೆಂಬ ನಾಲ್ಕು ಥೀಮ್‌ಗಳನ್ನು ಭೂಮಿಕೆಯನ್ನಾಗಿಟ್ಟುಕೊಂಡು ವಿನ್ಯಾಸಗೊಳಿಸಲಾಗಿದೆ. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಮರ್ಥ್ಯ ಸಂವರ್ಧನೆಗೆ ಅಗತ್ಯವಿರುವ ಭಾಷಿಕ, ಬೌದ್ಧಿಕ, ತೈಕ್ಷಣಿಕ, ವ್ಯವಹಾರಿಕ, ನೈತಿಕ ಮತ್ತು ಸಾಂಸ್ಕೃತಿಕ ಕಾಳಜಿಗಳನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಮಾನವೀಕರಣ ಪ್ರಕ್ರಿಯೆಯ ಉಪಕ್ರಮವಾಗಿ ಚರ್ಚೆಗೆ ಚೌಕಟ್ಟನ್ನು ಕಲ್ಪಿಸಿಕೊಡಲಾಗಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಆಸಕ್ತಿ ಮೂಡಿಸಲು ವಿಭಿನ್ನ ಬೋಧನೋಪಕರಣಗಳನ್ನು ಹಾಗೂ ಜ್ಞಾನದ ಇತರ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳಲು ಔಚಿತ್ಯವಾದ ವಾತಾವರಣವನ್ನು ಸೃಷ್ಟಿಸಲಾಗಿದೆ.

Model Question Paper

Max Marks: 60 Max **Time: 2 hrs**

1. ಪ್ರತಿ ಘಟಕದಿಂದ ಒಂದರಂತೆ ನಾಲ್ಕನ್ನು ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 10X3=30
2. ಪ್ರತಿ ಘಟಕದಿಂದ ಒಂದರಂತೆ ನಾಲ್ಕನ್ನು ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 5X3=15
3. ಎಲ್ಲ ಘಟಕಗಳಿಂದ ಒಟ್ಟು ಏಳು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ (ಲಘು ಪ್ರಶ್ನೆ ಅಥವಾ ಟಿಪ್ಪಣಿ ಅಥವಾ ಸಂದರ್ಭದ ಸ್ವಾರಸ್ಯ ಅಥವಾ ಕಾವ್ಯದ ಅರ್ಥವ್ಯಾಖ್ಯಾನ, ಸಾರಾಂಶ) ಐದಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 3X5=15

ಬಾಗಲಕೋಟ ವಿಶ್ವವಿದ್ಯಾಲಯ

ಕನ್ನಡ ಪಠ್ಯಕ್ರಮ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎಸ್ಸಿ (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.)

ಘಟಕ – 1 : ಕನ್ನಡ ನಾಡು–ನುಡಿ ಪ್ರಜ್ಞೆ

1. ಕನ್ನಡಾಂಬೆಯ ಹಿರಿಮೆ – ಬೆನಗಲ್ ರಾಮರಾವ್
2. ಹೊತ್ತಿತೊ ಹೊತ್ತಿತೊ ಕನ್ನಡ ದೀಪ – ಸಿದ್ದಯ್ಯ ಪುರಾಣಿಕ
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 ಅರ್ಥಪೂರ್ಣವೋ ಅರ್ಥರಹಿತವೋ – ಎಚ್. ನರಸಿಂಹಯ್ಯ
2. ದೇವರು ಪೂಜಾರಿ – ಕುವೆಂಪು
3. ಮೂರು ಘಂಟೆಗಳು – ಎಚ್. ಎಸ್. ಕೆ.
4. ವಿಜ್ಞಾನ ಪ್ರಶ್ನೆ : ಸಹಸ್ರಬುದ್ಧೆ (ಅನು: ಕೆ. ಪುಟ್ಟುಸ್ವಾಮಿ)

ಘಟಕ – 4 : ಸಂಕೀರ್ಣ

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

ಸೂಚನೆ : ಬಾಗಲಕೋಟ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಪ್ರಸಾರಾಂಗದಿಂದ ಸದರಿ ಪಠ್ಯಕ್ರಮವು ಪಠ್ಯಪುಸ್ತಕ ರೂಪದಲ್ಲಿ ಪ್ರಕಾಶನಗೊಂಡಿದೆ. ಅಧ್ಯಾಪಕರುಗಳು ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಅಥವಾ ಸ್ವತಂತ್ರವಾಗಿ ಅಧ್ಯಯನ ಸಾಮಗ್ರಿಗಳನ್ನು ಬಳಸಿಕೊಂಡು ಪಠ್ಯಬೋಧನೆಯನ್ನು ಮಾಡುವುದು.

SEMESTER–I **CourseCode:126BSC01LANAEC02T**

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ

ಮೊದಲ ಸೆಮಿಸ್ಟರ್ ಬಿ.ಎ/ಬಿ.ಎಸ್.ಡಬ್ಲೂ/ಬಿ.ಬಿ.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 ಆಂತರಿಕ ಅಂಕಗಳು (ಸೆಮಿಸ್ಟರ್‌ನ 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	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
1st 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 ಕೇಳಿ ಮೂರಕ್ಕೆ ಉತ್ತರಿಸಲು ಹೇಳುವುದು. 5X3=15
3. ಎರಡು ಭಾಗಗಳನ್ನು ಪ್ರತಿನಿಧಿಸಿ ಒಟ್ಟು ಏಳು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಿ (ಲಘು ಪ್ರಶ್ನೆ ಅಥವಾ ಟಿಪ್ಪಣಿ ಅಥವಾ ಸಂದರ್ಭದ ಸ್ವಾರಸ್ಯ ಅಥವಾ ಕಾವ್ಯದ ಅರ್ಥವ್ಯಾಪ್ತಾನ, 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 ಪದ್ದತಿಯನ್ನು ಮೇಲೆ ತಿಳಿಸಿರುವಂತೆ ನಡೆಸುವುದು.)

ಮೊದಲನೆಯ ಸೆಮಿಸ್ಟರ್

ಭಾಗ–1

1. ಕನ್ನಡ ಅಕ್ಷರ ಮಾಲೆ
2. ಕಾಗುಣಿತ ಮಾಲೆ
3. ಒತ್ತಕ್ಷರಗಳು
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

CourseCode:126BSC01LANAEC03TCourseTitle:English–I(L2)

BachelorofScience(Basic/Hons)Programme/BachelorofComputerApplications(Basic/Hons.)

Year	2023-24	**CourseCode:126BSC01LANAEC03T** **CourseTitle:Generic English– I**	**Credits**	3
Sem.	I		**Hours**	4
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60		
Course Outcomes		Attheend ofthecoursethestudentshould beableto: 1. AcquiretheLSRW(Listening,Speaking,Reading,andWriting)skills. 2. Learntoappreciateliterarytexts. 3. Obtaintheknowledgeofliterarydevicesandgenres. 4. Acquiretheskillsofcreativitytoexpressone's experiences. 5. Knowhowtousedigitallearningtools. 6. Beawareof theirsocial responsibilities. 7. Developcriticalthinkingskills. 8. Developgendersensitivity 9. Increasereadingspeed,analyticalskillsanddeveloppresentationskills. 10. Becomeemployablewithrequisiteprofessionalskills,ethicsandvalues		
UnitNo.		**CourseContent**	**SuggestedPedagogy**	**60Hours**
UnitI		1. WatertheElixiroflife–C. V.Raman 2. SpokenEnglishandBrokenEnglish-G.B.Shaw 3. Tigerin theTunnel -Ruskin Bond	Lectures TutorialsGroup Discussion	15hrs
UnitII		1. Vachana820(Speakingof Shiva)byA.K. Ramanujan 2. ToIndiaMyNativeLand–HenryDerozio 3. TheRoadnotTakenbyRobertFrost	LecturesTutorials GroupDiscussion	9hrs

UnitIII	Introducing One self, Introducing others, Requests, Offering help, Congratulating,Enquiries,SeekingpermissionGivinginstructionstodoa	LecturesTutorials	16hrs
	task,	GroupDiscussionRolePlay	
Unit IV	1. Wordclass(Nouns,Adjectives,Verbs,andAdverbs) 2. UseofArticles 3. UseofPrepositions(Place,Time, Position) 4. AskingYes/NoQuestions, 5. AskingWhQuestions 6. UsingIndirectQuestions forPoliteEnglish 7. AskingTagQuestions:foraffirmation 8. AskingNegativeQuestions:forConfirmation.	LecturesTutorials GroupDiscussion	20hrs
RecommendedLearningResources			
Print Resources	1. VijayFNagannawarand S.B.Biradared.NewHorizon,TextbookprescribedforB.A.andBSW Programme under CBCS, Rani Channamma University, Belagavi, 2021. 2. VijayFNagannawarand S.B.BiradaredEnglishStars,TextbookprescribedforBComandBBA Programme under CBCS, Rani Channamma University, Belagavi, 2021. 3. Dr.S. B.BiradarandProf.VijayFNagannawared.EnglishGems,TextbookprescribedforB.Sc.andBCA Programme under CBCS, Rani Channamma University, Belagavi, 2021. 4. QuirkRandolph,SidneyGreenbaum,GeoffreyLeech&JanSvartvik.AComprehensiveGrammarofthe English Language General Grammar. Longman. 5. Herring,Peter.CompleteEnglishGrammarRules.CreatespaceIndependentPub,California,2016. 6. JainCharul,PradyumnasinhRaj&YunusKarbharj.EnglishSkillsforAcademicPurposes.Macmillan Education. London, 2017		
Digital Resources	http://orelt.col.org/module/unit/4-grammar-improving-composition-skillshttps://www.academia.edu/26724441/A_Concise_Grammar_for_English_Language_Teachers.https://www.efluniversity.ac.in/EnglishPro.php https://www.britishcouncil.in/.		

QuestionPaperPattern

I.	10objectivequestions5fromUnitIand5fromUnitII	10x01=10
II.	01essaytypequestionout of2fromUnitI	01x10=10
III.	01essaytypequestionoutof2fromUnitII	01x10=10
IV.	02questionsoutof 4:from Unit III	02x05=10
V.	04LanguageActivityoutof6:fromUnitIV	04x05=20
Total		**60**

SEMESTER–I

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

Subject:Hindi **CourseCode:126COM01LANAEC03T**

Papertitle:Collectionofshortstories+FunctionalHindi

Hindi

Syllabus of B.Sc. Ability Enhancement compulsory Course

AECC

Title of the Subject/Discipline : A1 साहित्यिकविधा : कहानीसंकलन+प्रयोजनमूलकहिंदी				
Year	1	Course Code : AECC-1-HINDI (B.Sc.)	Credits	3
Sem.	1	Course Title/Discipline : Collection of Short stories+Functional Hindi Text : कहानीकुंज (कहानीसंकलन) वाणीप्रकाशन, नईदिल्ली-28	Hours	4
Formative Assessment Marks :40 Summative Assessment Marks :60 Duration of ESA :64 hrs.				
Learning Outcomes	1. कहानीकेपठनपाठनमेंरुचिउत्पन्नहोगी। 2. आधुनिकहिंदीकहानीकेविकासक्रमसेपरिचितहोंगे। 3. भाषायीशुद्धताकेप्रतिरुचिनिर्माणहोगी। 4. लेखनकौशलप्राप्तकरसकेंगे। 5. हिंदीभाषाकामहत्वतथाविविधरुपजानसकेंगे।			
Unit No.	Course Content		Suggested Pedagogy	Hours L/P/L
Unit I	कहानीकुंजकहानीसंकलनकीकहानियाँक्र.1,2,3		1. कक्षाव्याख्यान 2. संवादएवंबहस 3. सामूहिकचर्चा 4.रचनात्मकअभिव्यक्ति	16
Unit II	कहानीकुंजकहानीसंकलनकीकहानियाँक्र.4,5,6			16
Unit III	कहानीकुंजकहानीसंकलनकीकहानियाँक्र.7,8,9			16
Unit IV	हिंदीभाषाकेविविधरुप			16
Recommended Leaning Resources				
Print Resources	कहानीकुंज (कहानीसंकलन), संपादक :डॉ. पूर्णिमाआर. वाणीप्रकाशन, नईदिल्ली -28			
Digital Resources	https://hi.wikipedia.org/wiki/हिन्दी_कहानी https://youtu.be/CeC1o4YWKW8 https://www.youtube.com/watch?v=jF8nZwh_Hp8 https://www.youtube.com/watch?v=1dDP1c0k7KI https://www.youtube.com/watch?v=IzQKCapnazs https://www.youtube.com/watch?v=v-tPCGurjv8			

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

Subject : Sanskrit Course Code :126COM01LANAEC04T Title: Sanskrit Poetry, Grammar and Comprehension

Semester	AbilityEnhancementcompulsorycourse(L+T)	Marks	Credits
I	a. Introductionto ClassicalSanskrit Poetry b. SelectedPortionofaSanskritPoeticcomposition **Valmiki Ramayana,BalakandaSarga-I**	45	3
	a. SimpleSanskrit Sentenceformation b. Swarasandhi c. ComprehensioninSanskrit	15	
	ContinuousEvaluation: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 CourseCode:126COM01LACAEC05T

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

Title of the Subject/ Discipline : MARATHI				
Year	1	Course Code : **AECC-1, L-2 : MARATHI (B.Com.)**	Credits	3
Sem.	I	Course Title : Discipline : **वाङ्मयप्रकार : कथा + जाहिरात मसुदालेखन (Wangmayaprakar : Katha+Jahiratmasuda lekhan)** **Text- 'सांजवारा' -** *भीमराव गस्ती*, राशी प्रकाशन, बेळगाव (निवडक कथा - *नातं, शाळा, पराजीत, चोरी देवाची, कोंबडा, बेवारस, राजगोळीच्या जमीनदाराला धडा, मस, सांजवारा*)	Total Hours	64

Formative Assessment Marks : 40	Summative Assessment Marks : 60	Duration of ESA: 4 Hrs.

Learning Outcomes	
	1. To understand the basics of short story as a one of popular literary form in Marathi literature 2. To understand and to get the dos eternal life of values. 3. To develop the literary taste and ability to appreciate literature 4. To develop advertisement writing skills in preparing materials for media. 5. To understand nature a functions of Advertisement writing and to get the jobs in media.

Unit No.	Course Content/ अभ्यासघटक	Suggested Pedagogy अध्यापनशास्त्र	Hours U/P/L
I	मराठी कथा : स्वरूप आणि भीमराव गस्ती	1.Lecture Method 2. Assignment 3. Individual and group presentation 4. Virtual mode 5.PPT Presentation 6.Class Seminar 7.Topic Discussion 8.Visit to Media/Study Tour	12
II	*'सांजवारा'* मधील व्यक्तिरेखा		13
III	*'सांजवारा'* ची वाङ्मयीन विशेष		13
IV	जाहिरात : स्वरूप आणि प्रकार		13
V	जाहिरात मसुदालेखन आणि व्यावसायिक संधी		13

Recommended Learning Resources	
Print Resources	1. मराठीतील कथारूपे - रा. ग. जाधव, स्नेहवर्धन प्रकाशन, पुणे 2. कथा : संकल्पना आणि समीक्षा - सुधा जोशी, मौज प्रकाशन, मुंबई 3. व्यावहारिक मराठी - डॉ. लीला गावीलकर आणि डॉ. जयश्री पाटणकर, स्नेहवर्धन प्रकाशन, पुणे 4. उपयोजित मराठी - डॉ. संजय लांडगे, दिलीपराज प्रकाशन, पुणे 5. व्यावहारिक मराठी - ल. र. नासिराबादकर, फडके प्रकाशन, कोल्हापूर
Digital Resources	http://marathi.pratilipi.com 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 Course code : 126COM01LANAEC06T

Title of the subject/discipline: URDU				
Year	I	Corse Code: **AECC -1 –L-2-Urdu (B.Com)** Corse Title: Discipline:ڈرامہ اور مختصر کہانیاں (Drama aur mukhtasar kahaniyan) **Text: Azkar-e-Adab *by* Prof Hussain Basha Kaladgi published by Educatioal Book House Aligarh**	Credit	03
Sem.	I		Total Hours	64
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA: 4 Hrs.	
Outcomes:		1. Read and learn old and new Masnvi. 2. Know about famous Urdu Novelist and Novels. 3. Read and learn the old poems of Urdu Literature.		

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 (Dastan)	i) Lecture method, ii) Assignments, iii) Individual and Group Presentations and activities iv) Virtual Mode v) Power Point Presentation	12
Unit II	Tere Ishq ki Inteha Dil Main Kisi ko rah Kiye Donaun Jahan teri Muhabat Main		13
Unit III	Shuaye Ummid Muflasi Share say Khitab Nagma Hasrat		13
Unit IV	Husn Magarcha Hungama Kamal Dhundenge agar mulk mulk Banjara Nama		13
Unit V	Interview ki Ahmiyat wa Technic Urdu Akhbar main Cartoon Nigari		13

Recommended Learning Resources	
Print Resources	1. Azkar-e-Adab, Prof Hussain Basha A Kaladgi, Dr Syed Aleemulla Hussaini, Dr Abdurrahim A Mulla 2. Ayena-e-Sahafat, Dr. Syed Aleemullah Hussaini, Dr. S. M. Khatib
Digital Resources	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 : 126COM01LANAEC07T**

		Titleof thesubject/Discipline:ARABIC		
Year	I		Credit	30
Sem.	I	Corse Code:**AECC-1-ARABIC(B.Com)** CorseTitle:Discipline:(ثرنالمقدي،العرشالدجديال)AnNasrul Qadeem,Ashsherul Jadeed) Text:	Total Hours	64

FormativeAssessmentMarks:40	SummativeAssessmentMarks:60	DurationofESA:4Hrs

Outcomes :	1. BriefKnowledgeaboutArabicLanguage 2. BriefKnowledgeabout ArabicLiterature 3. Learn and Grasp the Essence of Arabic poetry,prose, Stories,Short Stories andNovels. 4. CommunicationinArabicLanguage 5. DevelopmentofTranslationSkills

UnitNo.	CourseContent	SuggestedPedagogy	Hours U/P/L
IUnit		i) Lecture method, ii) Assignments,iii)Individual andGroup Presentationsandactivities iv) Virtual Mode v) Power Point Presentation	12
IIUnit			30
IIIUnit			30
IVUnit			30
VUnit			30
RecommendedLearningResources			

Print Resources	في°ًْ4رساوذهندخذاسنابخبختسفد1-° سنرتنيسنريتا2- ًْ°اتسرسْ،ساوذهنيا4سير4رسي3- اسيرْ،ساوذهسنتوانلوننتسراياي خلسنياخ4ْ، نْ،سن،خروّ°وراجاخخي)سن،سءساولل(سنا4اسندخنا5-
Digital Resources	1. http://www.almaany.com 2. http://naseemalsham.com 3. http://m.marefa.org

Skill EnhancementCourse-1-DigitalFluency

NameoftheProgram:BachelorofScience (B.Sc.) **CourseCode:126COM01XXXSEC01T DIGITALFLUENCY**		
CourseCredits	No.ofHoursperWeek	TotalNo.ofTeachingHours
2Credits	**1+0+2**	**45Hrs**
Pedagogy: Classroomslecture,Casestudies,Groupdiscussion,Seminar& field worketc.,		
CourseOutcomes:Onsuccessfulcompletionofthecourse,theStudentswill beableto 1. To perform and get knowledge about applications, virtual learning and internet fundamentals. 2. Develop holisticallybylearning essentialskills such as effective communication, problem-solving, design thinking, and teamwork.		
I	**Introduction to Computer and Emerging Technology:** An Overview of Computer, Block Diagram of Computer, Evolution and Generations ofComputers, Software and its types, Operating Systems, types of operatingsystems, major functions of the operating systems. Introduction to emerging technologies and its applications- Artificial Intelligence, IoT,Cloud Computing, Machine learning, Big Data.	
II	**OfficeAutomationToolsandGoogleApps:** **Office automation tools:** MS-Word, MS-Excel and MS-Power point,creating an email-ID,workingwithe-mail,addressingwithccandbcc,**WorkingwithGoogle Apps**: Google forms: Creating and analysis of response, Google Docs – creating Google Docs and posting, Google Sheets- Creating and Editing, Google Drive-uploading and sharing of files and folders, working with Google Meet.	
III	**E-learning,E-commerceandSecurityAspects**: **E-learning** -Introduction to e-learning platforms such as Swayamand MOOC. **E-Commence:**BasicWebCommerceConcept,**E-paymentmethods:E-c**ashPayment System, Credit Payment System, Types of Electronic Payment Systems: CreditCard•DebitCard•SmartCard•E-Money•ElectronicFundTransfer (EFT). **Cyber Security:** Threats and Prevention, Viruses and its types, Antivirus, HTTP vs HTTPS, Firewall, Cookies, Hackers and Crackers.	
	LaboratoryActivities(Performthefollowingassignments): • Identifying the configuration and version of a computer system(PC), laptop, and a mobile phone. • ObservingfilesonOSbooting • Finding the background and foreground processes on Task manager. • Translating Kannada word into English in Google embedded with AI. • Use Google assistant on any android smartphone to dictate commands and tolaunch apps • Downloadingyoure-aadhar. • Creating resumeinWordprocessor. • Creatingpower point presentation for your college introduction andapplytransitions and animations. • CreateyourmarksheetinMicrosoftExcel. • Simplecomputationusingspread sheet. • Createanemail-IDandsendingandforwarding. • Attachingfilesanddownloadingfilesinemail. • CreatingaGoogleformandsendittoTenusers.	

	• Schedulingavirtualmeetand invitepeoplestojointhe Googlemeet. • Creating a hotspot froma 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 railwayreservation 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. • Demonstrateunsecured(HTTP)andsecured(HTTPS)websites.	

TextBooks:

1. Fundamentalsofcomputers- V.Rajaraman-Prentice-HallofIndia.
2. ComputerFundamentals-P.K.SinhaPublisher:BPBPublications.

ReferenceLinks:

- Digital 101 Course offered by Future Skill Prime Platform https://learn.futureskillsprime.in/
- OperatingSystems: https://ftms.edu.my/v2/wpcontent/uploads/2019/02/csca0101_ch06.pdf
- NineDotsinGoogle.com
- GmailCreatinglinks: https://clubrunner.blob.core.windows.net/00000000961/en-ca/files/homepage/how-to-create a-gmail-account/HowtoCreateaGmailAccount.pdf
- GoogleForms:https://pdst.ie/sites/default/files/Google%20Drive_1.pdf
- Google Meet: https://edvance.hawaii.hawaii.edu/wp-content/uploads/Google-Meet Tutorial-Getting-Started-and-Recording-a-Lecture.pdf
- Swayam:https://www.aicte-india.org/bureaus/swayam
- SecurityAspects-https://ncert.nic.in/textbook/pdf/lecs112.pdf
- E-Commence: http://www.aagasc.edu.in/cs/msccs/ECommerce%20Unit%201.pdf• E-payment methods: http://www.dspmuranchi.ac.in/pdf/Blog/e%20business%20UnitIII,%20%202020.pdf

PhysicalEducation-Yoga/HealthandWellness(VBC1/VBC2)	
CourseCredits 02	TotalContactHours 30
InternalAssessmentMarks:15	SemesterEndExaminationMarks:35
PhysicalEducation-Yoga–Course Code	**126COM01XXXVBC01B**
HealthandWellness-CourseCode	**126COM01XXXVBC02T**

CommonSyllabusforallUG Programmes

Semester-I

SkillEnhancementCourses(VBC-1)

TitleoftheCourse:

Course Code	Theory/ Practical	Credits	No. Of Teaching Hours/Week	TotalNo. Of TeachingHours	Duration of Examin hrs	Internal AssessmentMarks	Semester End Exam Marks	Total Marks
126COM01XXXVBC01B	Physical Educationand Yoga	**1**	**2**	**28**	**-**	**25**	**-**	**25**
126COM01XXXVBC02T	Health and Wellness	**1**	**2**	**14+14**	**-**	**25**	**-**	**25**

ContentofPracticalCourse	`28Hrs
Unit1:-PhysicalEducation • General&Specificwarmupexercises • RecreationGamesandFitness • 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.) **Unit2:-Yoga** • ShitalikarnaVyayama • Suryanamaskara(Compulsory) • BasicSetofYogaAsanas • BasicSetof Pranayama&Meditation	**28**

FormativeAssessment	
K2Assessmenttype	**WeightageinMarks**
Practicals	InternalAssessment-25
Total	25Marks

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).PhysicalFitness. NewDelhi:FriendsPublication.
3. Nagendra,H.R.&Nagarathna,R.(2002).Samagra Yoga Chikitse. Bengaluru: SwamiVivekanandaYogaPrakasana.
4. Kumar,Ajith.(1984)YogaPravesha.Bengaluru:RashtrothannaPrakashana.
5. D.MJyoti,YogaandPhysicalActivities(2015)lulu.com3101,Hillsborough,NC27609,UnitedStates

Semester-I

SkillEnhancementCourses(VBC-2)

TitleoftheCourse:**HealthandWellness**

ContentofCourse (1+0+1)	**14+14 Hrs**
Unit1:-Introduction 1. Meaning,DefinitionanddimensionsofHealth and Wellness. 2. FactorsaffectingFitnessandWellness 3. RoleofFitnessinmaintainingHealthandWellness 4. ImportanceofHealthEducationandWellness **Unit2:-MethodstoMaintainHealthandWellness** 1. RoleofPhysical ActivitiesandRecreationalGamesfor Health and Wellness 2. Roleof Yoga asanasand Meditationin maintaining Health and Wellness 3NutritionforHealth&Wellness **Unit3:-Anxiety,StressandAging** 1. MeaningofAnxiety,Stressand Aging 2. Types andCausesofStress 3. StressreliefthroughExerciseandYoga	**28**

FormativeAssessment

Assessment type	**WeightageinMarks**
TheoryandPractical	InternalAssessment 25 Marks
Total	25Marks

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

References

i. AAPHERD“HealthrelatedPhysicalFitnessTest Manual.”1980Publishedby Association drive Reston Virginia
ii. Bucher.C.A(1979)foundationofPhysicalEducation(5th editionMissouriCVMosbyCo.)
iii. Puri.k.ChandraS.S (2005)“HealthandPhysicalEducation”NewDelhi:SurjeetPublication
iv. ThomasDFaheyandothers.Fitandwell:6thEditionNewYork:McGrawHillPublishers,2005
v. DixitSuresh(2006)SwasthyaShikshasportsPublicationsDelhi.
vi. UppalAK&GautamGP(2008)HealthandPhysicalEducation.FriendsPublicationNewDelhi
vii. Pinto John and Roshan Kumar (2021) “Introductionto PhysicalEducation”,Louis Publication. Mangalor
viii. ShantiKY(1987)“TheScienceofYogicBreathier”(Pranayama)DBBombay
ix. ZieglerEF(2007)“AnIntroductiontoSportsandPhysicalEducation”PhilosophyDelh
x. PintoJohnandRamachandraK(2021)KannadaVersion“DahikaSikshanadaParichaya” Louispublications. Mangalore

SEMESTER–II

Detailsof AECCLanguage-IVOfferedby Various StreamthattheScienceStudentscanopt any oneamongthefollowing Subjects

Sl. No.	Department/ Subject	Category	CourseCode	Title
1	Kannada(L3)	ACCE-II	126BSC02LANAEC09T	Kannada
2	Functional Kannada(L3)	ACCE-II	126BSC02LANAEC10T	FunctionalKannada
3	English(L4)	AECC-II	126BSC02LANAEC11T	GenericEnglish–II
4	Hindi(L4)	AECC-II	126COM02LANAEC12T	CollectionofPoems+Translation
5	Sanskrit(L4)	AECC-II	126COM02LANAEC13T	SanskritProseLiterature,Grammarand Translation
6	Marathi(L4)	AECC-II	126COM02LANAEC14T	Wangmayaprakar:Atmacharitra +Patrakarita
7	Urdu (L4)	AECC-II	126COM02LANAEC15T	SahafataurMukhtasar
8	Arabic(L4)	AECC-II	126COM02LANAEC16T	AnNasruiJadeedAshaherulJadeed

Note:CourseCode:126BSC02LANAEC09T,CourseTitle:Kannada(L3)forsemesterIIwill beupdatedlater.

DetailsofAEC-1,VBC-3,VBC-4SubjectsstudiedbyScienceStudentsinSemester-I

Sl.No.	Category	CourseCode	Title
1	AEC 1	126COM01XXXAEC01T	**EnvironmentalStudies**
2	VBC 3	126COM02XXXVBC03B	Yoga/ Sports
3	VBC 4	126COM02XXXVBC04B	NCC/NSS/R&R(S&G)/Cultural

SEMESTER–II **CourseCode:126BSC02LANAEC10T**

ಶಾಸ್ತ್ರೀಯ ಕನ್ನಡ ಭಾಷಾ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ

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

ಕನ್ನಡ ಭಾಷಾ ವಿಷಯದ ಪಠ್ಯಕ್ರಮ ಹಾಗೂ ಆಂತರಿಕ ಮತ್ತು ಥಿಯರಿ ಪರೀಕ್ಷಾ ವಿಧಾನವು ಮೊದಲ ವರ್ಷಕ್ಕಾಗಿ ಅಂದರೆ **2021–22**ನೇ 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 (ಸೆಮಿಸ್ಟರ್‌ನ 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 17^{th} – 19^{th} 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 / workетс.

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
1st 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 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.)

ಎರಡನೆಯ ಸೆಮಿಸ್ಟರ್

ಭಾಗ–1

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

ಭಾಗ–2

1. ಕನ್ನಡ ಭಾಷೆ
2. ಸಂಸ್ಕೃತಿ
3. ಸಾಹಿತ್ಯ
4. ಜನಪದ ಸಾಹಿತ್ಯ
5. ಜ್ಞಾನಪೀಠ ಪುರಸ್ಕೃತ 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)syllabusforBachelorofScience(Basic/Hons)Programme/BachelorofComputerApplications (Basic/Hons.) Applications.

Year	2021	**CourseCode:**126BSC02LANAEC11T	**Credits**	3
Sem.	II	**CourseTitle:English–II**	**Hours**	4
CoursePre-requisites,ifany		NA		
FormativeAssessmentMarks:40		SummativeAssessmentMarks:60		
Course Outcomes	Atthe endofthe coursethestudent shouldbeableto: 1. AcquiretheLSRW(Listening,Speaking,Reading,andWriting)skills. 2. Learntoappreciateliterarytexts. 3. Obtaintheknowledgeofliterarydevicesandgenres. 4. Acquiretheskillsofcreativitytoexpressone's experiences. 5. Knowhowtousedigitallearningtools. 6. Beawareof theirsocial responsibilities. 7. Developcriticalthinkingskills. 8. Developgendersensitivity 9. Increasereadingspeed,analyticalskillsanddeveloppresentationskills. 10. Becomeemployablewithrequisiteprofessionalskills,ethicsandvalues			
UnitNo.	**CourseContent**		**SuggestedPedagogy**	**60Hours**
UnitI	1ZeroBudgetNaturalFarmingbyShibu 2. MilkaSingh: TheFlyingSikh –SoniaSanwalka 3. OnSayingPlease-A.G.Gardinar		Lectures Tutorials GroupDiscussion	15 hrs
Unit II	1. APrayerforMyDaughter–W.B. Yeats 2. StillIRise-MayaAngelou 3. HowdidyouDie?-Edmund VanceCooke		Lectures Tutorials GroupDiscussion	9hrs
UnitIII	1. ReadingpassagetogiveaTitle 2. Reading for Vocabulary building – synonyms, homonyms, homophones,suffixes,prefixes,collocations,oftenconfusedwords.		Lectures Tutorials GroupDiscussion	16hrs

	3. ReadingpassagesonSpecificfieldsforVocabularybuilding. 4. Barriersforeffectivelistening1hrChapter 5. TypesofListening 6. Techniquestoimprovelisteningskills. 7. ListeningActivities-listeningtopre-recordedaudios &movies	Role Play	
Unit IV	1. ReportedSpeech 2. Dialoguewriting 3. VerbalCommunicationandNon-verbalcommunication 4. Summarizing 5. SpeechWriting 6. EssayWriting 7. TranslationKannadaintoEnglishandEnglishintoKannada 8. Short Paragraphs based on themes with a message on nation, freedom fighters,andachievers.15shortparagraphswith5–6sentencesasmodel paragraphs. (a) Paragraph Translations from Kannada to English (b) Paragraph Translations from English to Kannada	Lectures Tutorials Group Discussion	20hrs
RecommendedLearningResources			
Print Resources	1. VijayFNagannawarandS.B.Biradared.NewHorizon,TextbookprescribedforB.A.andBSW Programme under CBCS, Rani Channamma University, Belagavi, 2021. 2. VijayFNagannawarand S.B.BiradaredEnglishStars,TextbookprescribedforBComandBBA Programme under CBCS, Rani Channamma University, Belagavi, 2021. 3. Dr.S.B.BiradarandProf.VijayFNagannawared.EnglishGems,TextbookprescribedforB.Sc.andBCA Programme under CBCS, Rani Channamma University, Belagavi, 2021. 4. QuirkRandolph,SidneyGreenbaum,GeoffreyLeech &JanSvartvik.AComprehensiveGrammarofthe English Language General Grammar. Longman. 5. Herring,Peter.CompleteEnglishGrammarRules.CreatespaceIndependentPub,California,2016. 6. JainCharul,PradyumnasinhRaj&YunusKarbharj.EnglishSkillsforAcademicPurposes.Macmillan Education. London, 2017 7. GeoffreyLeechandSvartik.CommunicativeGrammarofEnglish,Pearson 8. GeoffreyLeech.EnglishGrammarforToday,Palgrave 9. PrasadP.TheFunctional AspectsofCommunicativeSkills. 10. LeenaSen.CommunicationSkills,PrincetonHall5.VandanaSingh.TheWrittenWord,OUP		

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

QuestionPaperPattern

I.	10objectivequestions5fromUnitIand5fromUnitII	10x01=10
II.	1essaytypequestionoutof 2from UnitI	01x10=10
III.	01essaytypequestionoutof2fromUnitII	01x10=10
IV.	02questionsoutof4:fromUnitIII	02x05=10
V.	04LanguageActivityoutof6:fromUnitIV	04x05=20
Total		**60**

SEMESTER–IIAbilityEnhancementCompulsoryLanguageCourses(L4)for–BScSubject:Hindi Course code : 126COM02LANAEC12T Paper Title :Colllection of poems and +Translation

Syllabus of B.Sc. Ability Enhancement compulsory Course AECC

Title of the Subject/Discipline : A2 साहित्यिकविधा : कवितासंकलन+अनुवादकौशल				
Year	1	Course Code : AECC-2-HINDI (B.Sc.)	Credits	3
Sem.	2	Course Title/Discipline : Collection of Poems+Translation Text : काव्यकुसुम (कवितासंकलन) सुमित्रप्रकाशन, प्रयागराज-211001	Hours	4
Formative Assessment Marks :40 Summative Assessment Marks :60 Duration of ESA :64 hrs.				
Learning Outcomes	1. कवितापढ़करस्वयंकवितारचनेकीक्षमताप्राप्तकरेंगे। 2. आधुनिकहिंदीकविताकीपरिपूर्णजानकारीप्राप्तकरेंगे। 3. अनुवादकरनेमेंसक्षमहोंगे। 4. सूक्ष्मभावोंकीअभिव्यक्तिमेंसक्षमहोंगे			

Unit No.	Course Content	Suggested Pedagogy	Hours L/P/L
Unit I	काव्यकुसुमकाव्यसंकलनकीकविताएँक्र.1,2,3,4	1. कक्षाव्याख्यान 2. कवितापाठ 3. अनुवादका व्यावहारिकप्रयोग 4. सामूहिकचर्चा	16
Unit II	काव्यकुसुमकाव्यसंकलनकीकविताएँक्र.5,6,7,8		16
Unit III	काव्यकुसुमकाव्यसंकलनकीकविताएँक्र.9,10,11,12		16
Unit IV	अनुवादअभ्यास		16

Recommended Leaning Resources	
Print Resources	1. काव्यकुसुम (कवितासंकलन), सुमित्रप्रकाशन, प्रयागराज-211001 2. आधुनिकहिंदीकविता :डॉ. हरदयाल, आर्यप्रकाशनमंडल 3. आधुनिकहिंदीकविता : कमलाप्रसाद, वाणीप्रकाशन
Digital Resources	https://kavishala.in/@kavishala-labs/adhunika-hindi-kavita-ka-itihasa-kavishala-labs

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

Subject : SANSKRIT Coursecode:126COM02LANAEC13TTitle:SanskritProseLiterature,GrammarandTranslation

Semester	AbilityEnhancement compulsorycourse(L+T)	Marks	Credits
II	a.IntroductiontoSamskrutaGadyaKavya b.SelectedPortion ofaSanskritProsecomposition **VethalaPanchavimshathi(Selectedstories)**	45	3
	a.Correctionoferrors b.TigantaPrakaranam–LatLakara,LangLakara,LotLakara,VidhilingLakara,Lrut Lakara. c. Translationfrom SanskrittoKannada/English	15	
	ContinuousEvaluation:Attendance,Assignment,InternalTest,CreativeWriting,Conversation in Sanskrit	40	
	Total	100	3

Booksforstudy&Reference:

1. VethalaPanchavimshathi: PublishedbyChowkambaVidyabhavan.
2. HistoryofSanskritLiteraturebyM.R.Kale.
3. SamkrutaSahityadaItihasa(Kannada)S.RamachandraShastri-Prasaranga,BangaloreUniversityPublications.
4. BhashaShastraMattuSamskrutaSahityaCharitre(kannada)editedbyDr.K.Krishnamurthy,VidwanRanganatha Sharma and vidwan H.K. Siddagangaiah.
5. HistoryofSanskritLiterature-S.Rangachar
6. HistoryofClassicalSanskritLiterature-M. Krishnamachariyar
7. SamskrutaSahityaSameekshe(Kannada)Dr.M.ShivakumaraSwamy
8. HigherSanskritGrammar-M.R.Kale.

SEMESTER–IIAbilityEnhancementCompulsoryLanguageCourses(L4)for-BSc/BCA

Subject:Marathi Coursecode:126COM02LANAEC14TCourseTitle:Wangmayaprakar:Atmacharitra+Patrakarita

Title of the Subject/ Discipline : MARATHI				
Year	1	Course Code : **AECC-2,L-2 : MARATHI (B.Com.)**Course Title : Discipline : **वाङ्मयप्रकार : आत्मचरित्र + पत्रकारिता (Wangmayaprakar : Atmacharitra + Patrakarita)** **Text -** *'मी वनवासी' - सिंधुताई सपकाळ,* रिया पब्लिकेशन्स, कोल्हापूर	Credits	3
Sem	II		Total Hours	64
Formative Assessment Marks : 40		Summative Assessment Marks : 60	Duration of ESA: 4 Hrs.	

Learning Outcomes	1. To understand the development of personalities 2. To understand the way of structuring personality 3. To understand an account of a life and achievements 4. To learn from this autobiography how to work for downtroden peoples 5. To understand the life experiences and goals of the author 6. To provides opportunity for seeing patterns in one's life

Unit No.	Course Content/ अभ्यासघटक	Suggested Pedagogy अध्यापनशास्त्र	Hours L/P/L
I	मराठीतील आत्मचरित्रे : स्वरूप व वाटचाल	1.Lecture Method 2. Assignment 3. Individual and group presentation 4. Virtual mode 5.PPT Presentation 6.Class Seminar 7.Topic Discussion 8.Visit to orphanage & old age home- Study Tour	12
II	*'मी वनवासी'* मधील जीवन संघर्ष		13
III	*'मी वनवासी'* ची वाङ्मयीन वैशिष्ट्ये		13
IV	मराठी भाषा आणि पत्रकारिता		13
V	बातमीलेखनाचे स्वरूप आणि व्यावसायिक संधी		13

Recommended Learning Resources

Print Resources	1. चरित्र - आत्मचरित्र - अ. म. जोशी, स्नेहवर्धन प्रकाशन, पुणे 2. मराठीतील आत्मचरित्रात्मक लेखन - उषा हस्तक, स्नेहवर्धन प्रकाशन, पुणे 3. अविस्मरणीय चरित्रे - आत्मचरित्रे - नारायण भोसले, अथर्व प्रकाशन, जळगाव 4. वृत्तपत्र विद्या - प्रसन्नकुमार आकलूजकर, श्रीविद्या प्रकाशन, पुणे 5. उपयोजित मराठी - डॉ. संजय लांडगे, दिलीपराज प्रकाशन, पुणे
Digital Resources	http://vishwakosh.marathi.gov.in http://marathivishwakosh.org http://marathi.pratilipi.com http//:mr.vikaspedia.in http://www.maayboli.com http://esahity.com www.bbc.com

SEMESTER–IIAbilityEnhancement CompulsoryLanguageCourses(L4)for-BSc/BCASubject:Urdu

Course code : 126COM02LANAEC15TCourse Title : Sahafat aur Mukhtasar

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

Title of the subject/discipline: URDU				
Year	I	Corse Code: **AECC -2, L-2-Urdu (B.Com)**	Credit	03
Sem.	II	Corse Title: Discipline: صحافت اور مختصر کہانیاں(Sahafat aur mukhtasar kahaniyan) **Text: Ayena-e-Sahafat - Dr S M Khatib** **published by Educatioal Book House Aligarh**	Total Hours	64
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA: 4 Hrs.	
Outcomes:		1. Brief Knowledge about Urdu Language 2. Brief Knowledge about Urdu Literature 3. Development of Urdu Reading & Writing Skills		

Unit No.	Course Content	Suggested Pedagogy	Hours L/P/L
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) Lecture method, ii) Assignments, iii) Individual and Group Presentations and activities iv) Virtual Mode v) Power Point Presentation	12
Unit II	Sar main Souda bhi Nahin Mujhe Chhedane ko Saqi Dayar-e-Noor Main Tera Shaku		13
Unit III	Aye Sharif Insanu Samp Dahli Marhoom Raste Ki Mantaque		13
Unit IV	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 Resources	
Print Resources	1. Azkar-e-Adab, Prof Hussain Basha A Kaladgi, Dr Syed Aleemulla Hussaini, Dr Abdurrahim A Mulla 2. Ayena-e-Sahafat, Dr. Aleemullah Hussaini, Dr. S. M. Khatib
Digital Resources	1. http://www.urdubazar.com 2. http://www.rekhta.org 3. http://kitabghar.com

SEMESTER–IIAbilityEnhancementCompulsoryLanguageCourses(L 4)for-BSc/BCA

Subject:Arabic Coursecode:126COM02LANAEC16TCourseTitle:AnNasruiJadeedAshaherul Jadeed

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

Year	I	**Title of the subject/Discipline: ARABIC**	Credit	03
Sem.	II	Corse Code: **AECC-2- ARABIC (B.Com)** Corse Title: Discipline: النثر الجديد، الشعر الجديد (An Nasrul Jadeed, Ashsherul Jadeed) **Text:** نفحة الأدب لوحيد الزمان كيراتوي، ندوة العلماء، لكنؤ	Total Hours	64
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA: 4 Hrs	
Learning Outcomes	1. Brief Knowledge about Arabic Language 2. Get knowledge about History of Arabic Literature, its meanings and importance of the major Arabic Dialects. 3. Development of Arabic Reading & Writing Skills 4. Communication in Arabic Language 5. Development of Translation Skills			
Unit No.	**Course Content**	**Suggested Pedagogy**	**Hours U/P/L**	
Unit I	جزاء سنمار سينة مثلها، العابد والكلب الناصح، الأسد والثعلب، الصديق المخلص، الأخلاق المذمومة، العاملة الأمينة	i) Lecture method, ii) Assignments, iii) Presentations and activities iv) Virtual Mode v) Power Point Presentation	12	
Unit II	سورة الحجرات، سورة الجمعة		13	
Unit III	نشيد الكشافة، الضاحية، التحية المكتبية، الأستاذ والوالد، النجم، القمر		13	
Unit IV	العصر الجاهلي (الفصل الثالث والرابع)		13	
Unit V	التذكير والتأنيث، التركيب التوصيفي، وحدة وجمع، الجملة الفعلية		13	
Recommended Learning Resources				
Print Resources	1- نفحة الأدب لوحيد الزمان كيراتوي 2- مختارات الأدب لزيدان بدران 3- القرآن الكريم 4- تاريخ الأدب العربي للأستاذ أحمد حسن الزيات 5- النحو الواضح (الجزء الأول) لعلي الجارم ومصطفى أمين			
Digital Resources	1. http://www.almaany.com 2. http://naseemalsham.com 3. http://m.marefa.org			

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

Coursecode:126COM01XXXAEC01T CourseTitle:ENVIRONMENTAL STUDIES

NameoftheProgram:BachelorofScience(B.Sc) **CourseCode:126COM01XXXAEC01TNameoftheCourse:2.Environmental Studies**		
Course Credits	No.ofHoursperWeek	TotalNo.ofTeachingHours+Field work
2Credits	**2+0+0**	**45 Hrs**
Pedagogy: Classroomslecture,Casestudies,Groupdiscussion,Seminar& fieldworketc.,		

Module	Syllabus	Teaching Hours
I	**IntroductiontoEnvironmentalStudies:**Multidisciplinarynatureofenvironmentalstudies.Scope and importance; Concept of sustainability and sustainable development. **Ecosystems:** What is an ecosystem?Structureandfunctionofecosystem;Energyflowinanecosystem:foodchains,foodwebs and ecological succession. Case studies of the followingecosystems: a) Forestecosystem b) Grasslandecosystem c) Desertecosystem Aquaticecosystems(ponds,streams,lakes,rivers,oceans,estuaries) **NaturalResources:RenewableandNon-RenewableResources** Landresourcesandland-usechange;Landdegradation,soilerosionanddesertification. **Deforestation:**Causesandimpactsduetomining,dambuildingonenvironment,forests,biodiversity and tribal populations. **Water:**Useandover-exploitationofsurfaceandgroundwater,floods,droughts,conflictsoverwater (International & Inter-state). **Energy resources:** Renewable and non-renewable energysources, use of alternate energysources, growing energy needs, case studies.	15
II	**BiodiversityandConservation:**Levelsofbiologicaldiversity:Genetic,speciesandecosystem diversity;Biogeographyzonesof India;Biodiversitypatternsandglobalbiodiversityhotspots. Indiaasamega-biodiversitynation;Endangeredandendemicspeciesof India.	12

	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. Solidwastemanagement,Controlmeasuresofurbanandindustrialwaste. Pollutioncasestudies.	
III	**EnvironmentalPoliciesandPractices:**Climatechange,globalwarming,ozonelayerdepletion,acid rain and impacts on human communities and agriculture. Environment Laws:EnvironmentProtectionAct; Air(Prevention &Control ofPollution)Act;Water (Prevention and Control of Pollution) Act; Wildlife (Protection) Act; Forest Conservation Act. Internationalagreements:MontrealandKyotoprotocolsandConventiononBiological Diversity(CBD). Naturereserves,tribalpopulationsandrights,andhumanwildlifeconflictsinIndiancontext. **HumanCommunitiesandtheEnvironment** Humanpopulationgrowth:Impactsonenvironment,humanhealthandwelfare. Resettlement and rehabilitation of project affected persons; case studies. Disaster management: Floods, Earthquake, Cyclones and Landslides. Environmentalmovements:Chipko,Silentvalley,BishnoisofRajasthan. Environmentalethics:RoleofIndianandotherreligionsandculturesinenvironmentalconservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi). Fieldwork(5hours)	18

Reference

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

Carson,R.(2002).*SilentSpring*.HoughtonMifflinHarcourt.

ClimateChange:ScienceandPolitics.(2021).*CentreScienceandEnvironment*,NewDelhi.
Gadgil, M.,&Guha,R.(1993).*ThisFissuredLand:AnEcologicalHistoryofIndia*.Univ.ofCaliforniaPress. Gleeson, B. and

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

Groom, MarthaJ., GaryK.Meffe, and CarlRonald Carroll.(2006).*Principlesof Conservation Biology*.Sunderland: Sinauer Associates.

Nandini,N., Sunitha N.,& SucharitaTandon.(2019). *Atextbook onEnvironmentalStudies(AECC)*.Sapna BookHouse, 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).Env*ironmentalandPollutionScience*.AcademicPress.

RajitSenguptaandKiranPandey.(2021).*StateofIndia'sEnvironment2021:InFigures*.CentreScienceandEnvironment.

Singh,J.S.,Singh,S.P.andGupta,S.R.(2014).*Ecology,EnvironmentalScienceandConservation*.S.ChandPublishing,New Delhi.

Sodhi,N.S.,Gibson,L. &Raven,P.H.(Eds).(2013).Conser*vationBiology:VoicesfromtheTropics*.JohnWiley&Sons. Wilson, E. O.

(2006). *The Creation: An appeal to save life on Earth*. New York: Norton.

WorldCommissiononEnvironmentandDevelopment.(1987).*OurCommonFuture*.OxfordUniversityPress.

SEMESTER–II :ValueBasedCourse-3for-BSc/BCACoursecode:126COM02XXXVBC03B
CourseTitle:PHYSICALEDUCATION&SPORTS

Semester-II

SkillEnhancementCourses(SEC-I1)

TitleoftheCourse:

PHYSICALEDUCATION&SPORTS

CourseCode	Practical	Credits	No. Of Teaching Hours/Week	TotalNo. Of Teaching Hours	Duration of Exam in hrs	Internal Assessment Marks	SemesterEnd Exam Marks	Total Marks
126COM02XXXVBC03B	Physical Educationand Sports	**1**	**2**	**28**	**-**	**25**	**-**	**25**
Total		**1**	**2**	**28**	**-**	**25**	**-**	**25**

ContentofPracticalCourse	`28Hrs

Unit1:-PhysicalEducation&Sports	
• Conditioningexercises • Aerobics&Calisthenics • OneMajorGameandOneIndigenousGame(BasicSkills) • One Track/Field Event • IntramuralCompetitions	**28**

FormativeAssessment	
Assessmenttype	**WeightageinMarks**
Practicals	InternalAssessmentMarks-25
Total	25 Marks

Pedagogy:ThecourseshallbetaughtthroughLecture,Practicals,Interactive,Sessions,Materials, Assignments, Seminars, Intramural & Extramural.

References:1.Muller,J.P.(2000).Health, ExerciseandFitness.Delhi: Sports.

2. IAAFManual

3. Vanaik.A(2005)PlayFieldManual,FriendsPublicationNewDelhi

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

5. SteveOldenburg(2015)CompleteConditioningforVolleyball,HumanKinestics.

Note:SkillsofSportsandGames(GameSpecificbooks)maybereferred