KUVEMPU UNIVERSITY

Department of Studies and Research in Biotechnology and Bioinformatics

CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus for M. Sc. Biotechnology

(Approved in P.G BOS-Biotechnology Meeting- January 2019)

FIRST SEMESTER

Paper Code	Paper Title	Credits	Theory / Practical Marks		Total Marks
			I. A	Exam	
HARD CORE PAPERS –THEORY					
1.1	Chemistry of Biomolecules and Cellular Metabolism	4	25	75	100
1.2	Genetics and Molecular Biology	4	25	75	100
1.3	Microbiology	4	25	75	100
1.4	Cell Biology and Bioinformatics	4	25	75	100
PRACTICAL PAPERS					
1.1.1	Chemistry of Biomolecules and Cellular Metabolism	2	--	50	50
1.2.2	Genetics and Molecular Biology	2	--	50	50
1.3.3	Microbiology	2	--	50	50
1.3.3	Cell Biology and Bioinformatics	2	--	50	50
Total		24			600

SECOND SEMESTER

Paper Code	Paper Title	Credits	Theory / Practical Marks		Total Marks
			I. A	Exam	
HARD CORE PAPERS –THEORY					
2.1	Recombinant DNA Technology	4	25	75	100
2.2	Immunotechnology	4	25	75	100
SOFT CORE PAPERS –THEORY					
2.3.1	Enzymology	3	25	75	100
2.3.2	Genomics and Proteomics				
ELECTIVE PAPERS –THEORY					
2.4.1	Fermentation Technology	2	10	40	50
2.4.2	Basic Bioinformatics				
PRACTICAL PAPERS					
2.1.1	Recombinant DNA Technology	2	--	50	50
2.2.1	Immunotechnology	2	--	50	50
2.3.1.1	Enzymology	2	--	50	50
2.3.2.1	Genomics and Proteomics				
Total		19	--	--	500

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THIRD SEMESTER

Paper Code	Paper Title	Credits	Theory / Practical Marks		Total Marks
			I . A	Exam	
HARD CORE PAPERS -THEORY					
3.1	Agricultural Biotechnology	4	25	75	100
3.2	Animal Biotechnology	4	25	75	100
SOFT CORE PAPERS -THEORY					
3.3.1	Environmental Biotechnology	3	25	75	100
3.3.2	Pharmacological Biotechnology				
ELECTIVE PAPERS –THEORY					
3.4.1	Plant Tissue Culture Technology	2	10	40	50
3.4.2	Healthcare Biotechnology				
PRACTICAL PAPERS					
3.1.1	Agricultural Biotechnology	2	--	50	50
3.2.1	Animal Biotechnology	2	--	50	50
3.3.1.1	Environmental Biotechnology	2	--	50	50
3.3.2.1	Pharmacological Biotechnology				
Total		19	--	--	500

FOURTH SEMESTER

Paper Code	Paper Title	Credits	Theory / Practical Marks		Total Marks
			I . A	Exam	
HARD CORE PAPERS –THEORY					
4.1	Bioprocess Technology	4	25	75	100
4.2	Medical Biotechnology	4	25	75	100
4.3	Research Methodology	4	25	75	100
PRACTICAL PAPERS					
4.1.1	Bioprocess Technology	2	--	50	50
4.2.1	Medical Biotechnology	2	--	50	50
4.3.1	Research Methodology	2	--	50	50
PROJECT WORK					
4.4	Project Work	4	125 Dissertation	25 Viva	150
Total		22	--	--	600
Grand Total		84	--	--	2200

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Kuvempu University
Department of Chemistry
M.Sc. Chemistry Syllabus – 2019-2020 (CBCS Scheme)
M.Sc. Course Pattern and Scheme of Examination under CBCS approved by PG-BOS in Chemistry held on 25-01-2019

Course Pattern:

Semester	Theory code	Hrs/Week	Credits	Practicals code	Hrs/Week	Credits	Total Credits per Semester
I	**Hard core**						
	ChHC-1.1	4	4	ChHCL-1.1	4	2	
	ChHC-1.2	4	4	ChHCL-1.2	4	2	
	ChHC-1.3	4	4	ChHCL-1.3	4	2	
	ChHC-1.4	4	4				22
II	**Hard core**						
	ChHC-2.1	4	4	ChHCL-2.1	4	2	
	ChHC-2.2	4	4	ChHCL-2.2	4	2	
	ChHC-2.3	4	4	ChHCL-2.3	4	2	
	ChHC-2.4	4	4				
	Elective						
	ChEL-2.1	2	2				24
III	**Soft core**						
	ChSC-3.1	4	4	ChSCL-3.1	4	2	
	ChSC-3.2	4	4	ChSCL-3.2	4	2	
	ChSC-3.3	4	4	ChSCL-3.3	4	2	
	ChSC-3.4	4	4				
	Elective						
	ChEL-3.1	2	2				24
IV	**Soft core**						
	ChSC-4.1	4	4	-	-	-	
	ChSC-4.2	4	4	-	-	-	
	ChSC-4.3	4	4	-	-	-	
	ChSC-4.4	4	4				
	Project Work						
	ChPR-4.1	8	4				20
Total Credits : I - IV SEMESTER (90) + Soft Skills (03) = 93							

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I

Theory and Practicals (M.Sc. in Chemistry - CBCS):

ChHC-1.1: Analytical Chemistry-I
ChHC-1.2: Inorganic Chemistry-I
ChHC-1.3: Organic Chemistry-I
ChHC-1.4: Physical Chemistry-I

ChHCL-1.1: Inorganic Chemistry Practicals-I
ChHCL-1.2: Organic Chemistry Practicals-I
ChHCL-1.3: Physical Chemistry Practicals-I

ChHC-2.1: Analytical Chemistry-II
ChHC-2.2: Inorganic Chemistry-II
ChHC-2.3: Organic Chemistry-II
ChHC-2.4: Physical Chemistry-II
ChEL-2.1: Chemistry Elective-I

ChHCL-2.1: Inorganic Chemistry Practicals-II
ChHCL-2.2: Organic Chemistry Practicals-II
ChHCL-2.3: Physical Chemistry Practicals-II

ChSC-3.1: Analytical Chemistry-III
ChSC-3.2: Inorganic Chemistry-III
ChSC-3.3: Organic Chemistry-III
ChSC-3.4: Physical Chemistry-III
ChEL-3.1: Chemistry Elective-II

ChSCL-3.1: Inorganic Chemistry Practicals-III
ChSCL-3.2: Organic Chemistry Practicals-III
ChSCL-3.3: Physical Chemistry Practicals-III

ChSC-4.1: Analytical Chemistry-IV
ChSC-4.2: Inorganic Chemistry-IV
ChSC-4.3: Organic Chemistry-IV
ChSC-4.4: Physical Chemistry-IV
ChPR-4.1: Project Work

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PG-Ic

KUVEMPU UNIVERSITY

Department of PG Studies in Industrial Chemistry

Shankaraghatta

New CBCS Scheme Course Pattern w.e.f.

Sem	Theory Code	Max Marks 100		Credits Hrs/ Week	Credits Points	Practical Code	Max Marks 50	Credits Hrs/ Week	Credits Points	Total Credits per semester
		Theory 75	+ IA + 25							
I	IC.HC: 1.01	75	25	4	4	IC.HC : 1.05	40+10	4	2	22
	IC.HC: 1.02	75	25	4	4	IC.HC : 1.06	40+10	4	2	
	IC.HC: 1.03	75	25	4	4	IC.HC : 1.07	40+10	4	2	
	IC.HC: 1.04	75	25	4	4					
II	IC:HC: 2.01	75	25	4	4	IC:HC: 2.05	40+10	4	2	24
	IC:HC: 2.02	75	25	4	4	IC:HC: 2.06	40+10	4	2	
	IC:HC: 2.03	75	25	4	4	IC:HC: 2.07	40+10	4	2	
	IC:HC: 2.04	75	25	4	4					
	Elective	40	10	2	2					
III	IC:HC: 3.01	75	25	4	4	IC.HC : 3.04	40+10	4	2	24
	IC:HC: 3.21	75	25	4	4	IC.HC : 3.05	40+10	4	2	
	IC:SC: 3.03	75	25	4	4	IC.HC : 3.06	40+10	4	2	
	IC:SC: 3.04	75	25	4	4					
	Elective	40	10	2	2					
IV	IC HC: 4.01	75	25	4	4	IC HC: 4.04	40+10	4	2	20
	IC SC: 4.02	75	25	4	4	IC HC: 4.05	40+10	4	2	
	IC SC: 4.03	75	25	4	4	Project	75+25	4	4	
										90
	Personality Development Programme								2	
	Communication Skills								2	
	Computer Skills								2	06
										96

1st Semester

Theory papers
IC.HC: 1.01 Analytical & Separation Techniques
IC HC: 1.02 Inorganic Chemistry-I
IC HC: 1.03 Organic Chemistry I
IC HC: 1.04 Physical Chemistry-I

Practical
IC.HC: 1.05 Inorganic Chemistry
IC HC: 1.06 Organic Chemistry
IC HC: 1.07 Physical Chemistry

2nd Semester

Theory papers
IC: HC: 2.01: Spectroscopic Techniques
IC HC: 2.02: Inorganic Chemistry – II
IC HC: 2.03: Organic Chemistry-II
IC HC: 2.04: Physical Chemistry - II
Elective

Practical
IC.HC: 2.05 Inorganic Chemistry
IC HC: 2.06 Organic Chemistry
IC HC: 2.07 Physical Chemistry

3rd Semester

Theory papers
IC HC: 3.01: Chemical process principles
IC HC: 3.02: Advanced Organic and Medicinal chemistry
IC SC: 3.03: Polymer Chemistry and Technology
IC SC: 3.04: Pollution monitoring and control
Elective

Practical
IC.HC: 3.05 Preparation, Separation and Estimation
IC HC: 3.06 Technical Analysis-I
IC HC: 3.07 Technical Analysis-II

4th Semester

Theory papers
IC HC: 4.01: Unit Operations
IC SC: 4.02: Organo Metallic and Bioinorganic Chemistry
IC SC: 4.03: Advanced Analytical Techniques

Practical
IC HC: 4.04: Commercial Analysis
IC HC: 4.05: Experiments in Polymer Chemistry
IC HC: 4.06: Project work and Viva-voice

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Physics – PG

Hardcore PHYH 1.1: Mathematical Physics-I (3 Credits)

Unit-I

Vectors and Tensors: Concept of Gradient, Divergence and Curl; Vector Identities; Orthogonal Curvilinear Co-ordinates. Metric in Orthogonal Curvilinear Co-ordinates; Gradient, Divergence, Curl and Laplacian in orthogonal curvilinear coordinates; Line, surface and volume integrals of vectors; Gauss's, Green's and Stoke's theorems (without proof) and their applications
Definition of Tensors; Tensor Algebra, Examples of tensors in Physics

(10 hours)

Unit II

Special Functions: Solution of Helmholtz and Laplace equation using variable separation method; Series solution method for obtaining Bessel, Legendre, Hermite and Laguerre polynomials; Generating functions, Recurrence relations and Orthogonality properties for Bessel, Legendre, Hermite and Laguerre polynomials; Spherical Bessel functions, Associated Legendre polynomials and Spherical harmonics (brief reference only);

(12 hours)

Unit III

Integral Transforms: Fourier Transforms; Sine and Cosine Transforms; Inverse Fourier Transforms; Convolution Theorem; Parseval's theorem; Laplace Transforms; Convolution theorem; Inverse Laplace Transforms; Solution of Differential equations using Laplace Transforms.
Sturm-Liovelle Theory; Self-adjoint operators; Dirac Delta Function and its Properties;

(8 hours)

Unit IV

Complex Analysis: Analytic Functions: Cauchy-Riemann conditions; Cauchy Integral Theorem; Cauchy Integral Formula; Singularities; Taylor and Laurent expansion; Definite Integrals using Calculus of Residues.

(10 hours)

Unit V

Calculus of Variations: Variation of a system with one independent and one dependent variable; Euler's equation, Variation of a system with one independent and many dependent variables; Constraints; Lagrange multipliers, Variation subject to constraints.

(8 hours)

Reference Books:

1. G. Arfken and H.J.Weber, Mathematical Methods for Physicists, Academic Press,5th ed. (2000)
2. M.L.Boas, Mathematical Methods in the Physical Sciences, 2nd edition, Wiley (1983)
3. P.K. Chattopadhyaya, Mathematical Physics, Wiley Eastern (1990)
4. S. Hassani, Mathematical Physics, Springer (1998)
5. I.N. Sneddon, Special Functions of Mathematical Physics and Chemistry, Longman (1980)
6. L.A. Pipes and I.R. Harwell, Applied Mathematics for Physicists and Engineers, McGraw-Hill (1971)
7. C.R. Wylie and L.C. Barrett, Advanced Engineering Mathematics, 5th edition, Wiley Eastern, McGraw-Hill (1982)
8. J. Mathews, R.L. Walker, Mathematical Methods of Physics, 2nd ed.Addison-Wesley(1971)
9. Mathematical Methods for Physics and Engineering: K.F.Riley, M.P.Hobson and S.J.Bence, Cambridge University Press, Cambridge (1998)
10. M.R. Spiegel in Schaum's Outline Series, McGraw-Hill (1964) a)Vector Analysis, b) Complex Variables c) Laplace Transforms d) Differential Equations e) Matrices.

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Softcore PHYS 4.3.2: Nuclear Physics III (04 Credits)

Unit I

Nuclear Fission and Fusion:

Fission processes,Spontaneous fission,Emission cross section,Nature of the fragments,Bohr-Wheeler theory of nuclear fission,statistical model of fission, photo fission, photo nuclear reactions, condition for fusion, magnetic confinement.

(10 Hours)

Unit Neutron Physics: Radioactive neutron sources, mono energetic neutron sources, accelerator based neutron sources, interaction of neutrons with matter, elastic and inelastic collisions, resonance neutrons, foil activation, neutron detection and spectrometry, neutron flux measurements, targets for production of neutrons, collimation and shielding, fast neutron dosimetry.

(15 Hours)

Unit III & IV

Reactor Physics: Slowing down of neutrons, moderators, condition for controlled chain reaction in a homogeneous reactors , effect of reflector critical size

Criticality Condition: Four factor formula:Neutron transport equation, Diffusion theory of neutrons,one group critical equations.The Fermi age diffusion method and multi group diffusion theory.

Homogeneous reactor systems: Infinite multiplication factor- calculation of critical size, Heterogeneous reactor systems. Calculation of thermal utilisation. Calculation of optimum lattice. Fast reactors, Breeder reactors, Multi-group equations. Evaluation of buckling, Core composition and critical mass.

(25 Hours)

Unit V

Nuclear Fuels: The fuel cycle, production of reactor fuels: Sources of Uranium, production of Uranium and its compounds: Thorium and Plutonium. Properties of Fuel Materials: Uranium and its compounds, Plutonium and Thorium Fuel Materials.

(14 Hours)

Textbooks:

1. **P M Zweifel,** Reactor Physics, McGraw Hill(1973)
2. **W M Stacey,** Nuclear Reactor Physics, Wiley(2001)
3. **J J Duderstadt and L J Hamilton**, Nuclear Reactor Analysis, Wiley (1976)
4. **J R Lamarsh and A J Baratta**, Introduction to Nuclear Engineering,3rd ed,Prentice Hall(2001)
5. **J R Lamarsh,** Introduction to Nuclear Reactor Theory, Amer.Nuc.Soc(2002)
6. **S N Ghoshal**, Nuclear Physics, 3rd ed, S Chand(2003)
7. **G Bell, S Glasstone,** Nuclear Reactor Theory, Robert E. Krieger Publishing(1985)
8. **S Glasstone and M C Edlund,** The Elements of Nuclear Reactor Theory, Reinhold(1952)

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Softcore Lab PHYSP 4.4.1: Condensed Matter Physics Lab II (2credits)
Softcore Lab PHYSP 4.4.2: Nuclear Physics Lab II (2credits)
PHY 4.5: Project work

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UG BOS – **BIOTECHNOLOGY**

①

Scheme for the Six Semesters (Three Years), B.Sc., Course in Biotechnology

	Theory Paper	Theory			Practical	Grand Total
		Marks	IA	Total	Marks	
I Sem	**Paper 1.1:** Cell Biology and Genetics	50	10	60	40	100
II Sem	**Paper 2.1:** Biochemistry, Metabolism and Biotechniques	50	10	60	60	100
III Sem	**Paper 3.1:** Molecular Biology, Biostatistics and Bioinformatics	50	10	60	40	100
IV Sem	**Paper 4.1:** Genetic Engineering, Bioethics and Biosafety	50	10	60	60	100
V Sem	**Paper 5.1:** Microbial Biotechnology and Bioprocess Engineering	50	10	60	40	100
	Paper 5.2: Immunology and Medical Biotechnology	50	10	60	60	100
VI Sem	**Paper 6.1:** Plant and Agricultural Biotechnology	50	10	60	40	100
	Paper 6.2: Animal Biotechnology	50	10	60	60	100
Total						**800**

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Practical VIII
(PROJECT)

21

Max.Marks:40

Each student will be allotted a PROJECT title to which, the student has to carryout review and analysis of literature pertaining to the topic under the guidance of a faculty of the Department. Studentshave to carry out a research project on chosen topic.

Each student has to submit the PROJECT REPORT in triplicate after thorough corrections and plagiarism check under their respective guides duly signed by the guide and Head of the Department.

The scheme of distribution of marks for Dissertation is as follows

- Project Report Submission = 25 Marks
- Presentation = 10 Marks
- Viva = 05 Marks

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KUVEMPU UNIVERSITY

CURRICULUM IN ZOOLOGY FOR B.Sc. (UG)

B.Sc. DEGREE SEMESTER SYLLABUS (Effective from 2018-19 onwards)

		Theory			Practical		
Year	Sem	Paper	Tit le	Teaching Hrs	Paper	Title	Teaching Hrs
I	1	1	Diversity and Functional Anatomy of Non-Chordates	60 hrs	1	Diversity and Functional Anatomy of Non-Chordates	15 x3 = 45hrs
	2	2	Diversity and Functional Anatomy of Chordates	60 hrs	2	Diversity and Functional Anatomy of Chordates	15 x3 = 45hrs
II	3	3	Ecology, Ethology and Biodiversity	60 hrs	3	Ecology, Ethology and Biodiversity	15 x3 = 45hrs
	4	4	Animal Physiology, Biochemistry and Biostatistics	60 hrs	4	Animal Physiology, Biochemistry and Biostatistics	15 x3 = 45hrs
III	5	5.1	Cell Biology, Microbiology and Immunology	45 hrs	5	Cell Biology, Microbiology and Immunology	15 x3 = 45hrs
		5.2	Applied Zoology, Histology and Bio-techniques	45 hrs	6	Applied Zoology, Histology and Bio-techniques	15 x3 = 45hrs
	6	6.1	Genetics, Molecular Biology and Evolution	45 hrs	7	Genetics, Molecular Biology and Evolution	15 x3 = 45hrs
		6.2	Developmental Biology and Animal Biotechnology	45 hrs	8	Developmental Biology and Animal Biotechnology	15 x3 = 45hrs

Teaching hours: I & II year 4 hours theory and 3 hrs Practical / week. III year 3+3=6 hrs theory and 3+3=6 hours Practical / week.

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B.SC. ZOOLOGY SEMESTER V – PRACTICAL PAPER- 5.2

PROJECT WORK

Batches consisting of 4 -6 students each are formed. They are given a suitable project work by the Zoology faculty in-charge of the batch. Each batch should conduct survey/observations/experiments and submit the report on the project under the guidance of Zoology faculty. The project work should concentrate on the problems /animals of surrounding area pertaining to zoology. Each batch should work as a team with suitable coordination among them. A copy of project report must be submitted to the department.

PRACTICAL PAPER 5.2-SCHEME OF PRACTICAL EXAMINATION

Project work and report

Time: 3 hrs. Max. marks : 40

Q I Project submission:

Title and Objectives (about 100 words) should be mentioned clearly in answer book …. 20 marks

Q II Seminar / Presentation 15 marks

Q III Viva voce / Discussion 5 marks

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UG - BSc
C.S.

SIXTH SEMESTER BSc

Computer Science -VIII

BSC-6.2 SOFTWARE ENGINEERING AND COMPUTER NETWORKS

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Software Engineering: **10 hrs**

IEEE definition of Software and Software Engineering, Software Problems, Software engineering challenges, Software quality attributes, phases in software development (Phased Development process), Definition of Software process, Components of software process, desired characteristics of software process, Software development process models- waterfall model, prototype model and spiral model .

Unit 2- Software design: **09 hrs**

Definition of SRS, need for SRS, Characteristics of SRS, Structure of SRS, design objectives ,design principles, module level concepts – coupling and cohesion.

Unit 3- Coding and testing : **09 hrs**

Definition of Coding, Programming principles and guidelines, top down and bottom-up Approaches, definition of testing, testing fundamentals, levels of testing, Difference between black box testing and white box testing.

Unit 4-Introduction to Computer networks Network Hardware: **10 hrs**

Definition of computer network, Goals of computer network, Types of Networks based on transmission technology - Broadcast, point- to -point, Types of Networks based on size & scale - LAN, WAN, MAN, Protocol hierarchies (Network software), Network topologies – Bus, Mesh, Ring, tree and star.

Unit 5- Network Software, Reference models and Transmission Media: **10 hrs**

Reference models - OSI / ISO model, TCP / IP model, ARPANET,Transmission Media - twisted pair, coaxial cable, fiber optics cable, Internet and its applications, Wireless media - Bluetooth, Wi-Fi, internet and its applications

References:

1. An integrated approach to Software Engineering: PankajJalote.
2. Software Engineering a practitioners approach: Roger Pressman.
3. Computer Networks:5th Edition, Andrew S Tanenbaum.

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QUESTION PAPER PATTERN FOR B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: PROJECT LAB

PROJECT LAB EXAM SCHEME

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The Project work should be either an individual lone or a group of not more than five members.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The examiner will evaluate the project work as follows:

- Project Report - 10 Marks
- Project Demo - 10 Marks
- Viva-Voce - 20 Marks

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'BCA'

NEW SYLLABUS FOR BCA (EFFECT FROM 2019-20)

Semester	Paper	No of Hours (Theory)	No of Hours (Practical)	IA	External
I	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Computational Mathematics - 1	4	-	20	80
	Computer Fundamentals	4	-	20	80
	Introduction to Information Technology	4	-	20	80
	Programming Fundamentals & C-Programming	4	-	20	80
	Excel & C Lab	-	3	20	80
	TOTAL			**140**	**560**
II	English	4	-	20	80
	Kannada/Hindi/ Sanskrit/ Urdu	4	-	20	80
	Computational Mathematics - 2	4	-	20	80
	C & Linear Data Structures	4	-	20	80
	Database Management System – I	4	-	20	80
	Digital Fundamentals	4	-	20	80
	DS & Advanced Excel Lab	-	3	20	80
	TOTAL			**140**	**560**
III	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Non Linear Data Structures using C++	4	-	20	80
	Database Management System – II	4	-	20	80
	System Software	4	-	20	80
	DS Lab Using C++	-	3	20	80
	SQL Using MYSQL	-	3	20	80
	TOTAL			**140**	**560**
IV	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Java	4	-	20	80
	PL/ SQL and Data Warehousing	4	-	20	80
	Software Engineering	4	-	20	80
	Java Lab	-	3	20	80
	PL/ SQL & DW Lab	-	3	20	80
	TOTAL			**140**	**560**
V	Advanced programming in java	4	-	20	80
	Web Programming	4	-	20	80
	Operating System	4	-	20	80
	Data Communication	4	-	20	80
	Computer Networks	4	-	20	80
	Advanced java Lab	-	3	20	80
	Web Programming Lab	-	3	20	80
	TOTAL			**140**	**560**
VI	Unix Operating System	4	-	20	80
	. Net Programming	4	-	20	80
	Elective - 1 Digital Image Processing / Cloud Computing	4	-	20	80
	Elective – 2 Computer Graphics/ Operation Research	4	-	20	80
	Unix & Net Lab	-	3	20	80
	Project Lab	-	3	20	80
	TOTAL			**120**	**480**

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