

**Karnatak University, Dharwad**



NAAC Accredited with  
"A" Grade-2014

**Syllabus and Structure  
For  
B.Sc. Botany  
(I-VI SEMESTER)**

**UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)**



**With Effect from 2020-21 onwards**

**SEMESTER III**  
**CORE COURSE BOTANY –PAPER III**  
**PLANT ANATOMY AND EMBRYOLOGY**  
**(Credits: Theory-4, Practicals-2)**  
**THEORY**

	<b>Lectures: 60</b>
<b>Unit 1: Meristematic and permanent tissues</b> Root and shoot apical meristems; Simple and complex tissues.	<b>(8 Hours)</b>
<b>Unit 2: Organs</b> Structure of dicot and monocot root stem and leaf.	<b>(4 Hours)</b>
<b>Unit 3: Secondary Growth</b> Vascular cambium – structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood).	<b>(8 Hours)</b>
<b>Unit 4: Adaptive and protective systems</b> Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes.	<b>(8 Hours)</b>
<b>Unit 5: Structural organization of flower</b> Structure and development of anther and pollen; Structure and development of ovule, types of ovules; Types of embryo sacs, organization and ultra structure of mature embryo sac.	<b>(8 Hours)</b>
<b>Unit 6: Pollination and fertilization</b> Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms.	<b>(8 Hours)</b>
<b>Unit 7: Embryo and endosperm</b> Endosperm types, structure and functions; Dicot and monocot embryo; Embryo-endosperm relationship.	<b>(8 Hours)</b>
<b>Unit 8: Apomixis and polyembryony</b> Definition, types and practical applications.	<b>(8 Hours)</b>

**SEMESTER IV**  
**CORE COURSE BOTANY –PAPER IV**  
**PLANT PHYSIOLOGY, METABOLISM AND PHYTOCHEMISTRY**  
(Credits: Theory-4, Practicals-2)  
**THEORY**

**Lectures: 60**

- Unit 1: Plant-water relations** (8 Hours)  
Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.
- Unit 2: Mineral nutrition** (6 Hours)  
Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps.
- Unit 3: Translocation in phloem** (6 Hours)  
Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading.
- Unit 4: Photosynthesis** (12 Hours)  
Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C<sub>3</sub>, C<sub>4</sub> and CAM pathways of carbon fixation; Photorespiration.
- Unit 5: Respiration** (6 Hours)  
Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway.
- Unit 6: Enzymes** (4 Hours)  
Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition.
- Unit 7: Plant growth regulators** (6 Hours)  
Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene.
- Unit 8: Plant response to light and temperature** (6 Hours)

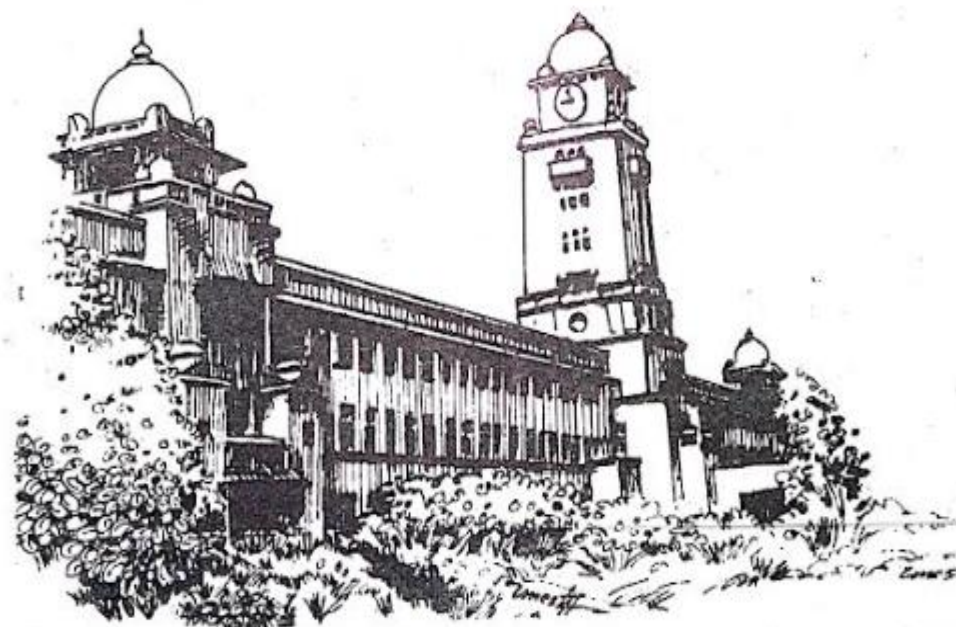
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NAAC Accredited with  
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**B.Sc. Programme**  
**Syllabus for**  
**CHEMISTRY (OPTIONAL)**

AS DISCIPLINE SPECIFIC COURSE (DSC)  
and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)



Effective from 2020-21

**Discipline Specific Course (DSC) under CBCS**

**B.Sc. Semester - III**

**CHEMISTRY: CHT: C**

**Credits: I. Theory : 04 Theory class 4hrs /wk. Total theory: 60 Lectures  
80 marks for Sem end Examination(3 hrs) & 20 marks IA**  
**II. Practical : 02 Practical: 4 hrs./wk. Total Practical: 52 hrs.  
40 marks for Sem end Examination(3 hrs) & 10 marks IA**  
**Total Credits : 06 Total Theory marks 100 and Practical marks 50**

**Chemical Energetics:** First Law of Thermodynamics. Enthalpy, concept of standard state, standard enthalpy, Types of enthalpies: formation, combustion, neutralization, integral and differential enthalpies of solution and dilution, lattice enthalpy(numerical problems). Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature - Kirchhoff's equation. **(08 Lectures)**

**Chemical Equilibrium:** Limitations of first law of thermodynamics, concept of entropy, Second law of thermodynamics, Free energy, free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between  $\Delta G$  and  $\Delta G^\circ$ , Le Chatelier's principle. Relationships between  $K_p$ ,  $K_c$  and  $K_x$  for reactions involving ideal gases(numerical problems). Third Law of thermodynamics and calculation of absolute entropies of substances. **(08 Lectures)**

**Ionic Equilibria:** Strong, moderate and weak electrolytes with examples, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts - applications of solubility product principle(numerical problems). **(10 Lectures)**

**Distribution law:** Nernst distribution law and its derivation. Limitations of law. Modification of distribution law for change in molecular state(association and dissociation). Application in solvent extraction- simple and multiple extractions. Derivation for multiple extraction(numerical problems). **(4 Lectures)**

**Carboxylic acids and their derivatives:** Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Carboxylic acids (aliphatic and aromatic):*Preparation:* Acidic and Alkaline hydrolysis of esters. *Reactions:* Hell - Vohlard - Zelinsky Reaction.

**Carboxylic acid derivatives (aliphatic) (Up to 5 carbons) :** *Preparation:* Acid chlorides, Anhydrides, Esters and Amides from acids and their interconversion. *Reactions:* Comparative study of acylation of acyl derivatives. Reformatsky Reaction, Perkin condensation. **(6 Lectures)**

**Amines and Diazonium Salts:** Amines (Aliphatic and Aromatic): (Up to 5 carbons) *Preparation:* from alkyl halides, Gabriel's Phthalimide synthesis, Hofmann Bromamide reaction. *Reactions:* Hofmann vs. Saytzeff elimination, Carbylamine test, Hinsberg test, with  $\text{HNO}_2$ , Schotten - Baumann Reaction. Electrophilic substitution (case aniline): nitration, bromination, sulphonation.

**Diazonium salts:** *Preparation:* from aromatic amines. *Reactions:* conversion to benzene, phenol, dyes. **(6 Lectures)**

**Heterocyclic Compounds:** Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan, Pyrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine, Structural elucidation of Indole,

**Discipline Specific Course (DSC) under CBCS**

**B.Sc. Semester - IV**

**CHEMISTRY: CHT: D**

<b>Credits: I. Theory</b>	<b>: 04</b>	<b>Theory class 4hrs /wk. Total theory: 60 Lectures</b>
		<b>80 marks for Sem end Examination(3 hrs) &amp; 20 marks IA</b>
<b>II. Practical</b>	<b>: 02</b>	<b>Practical: 4 hrs./wk. Total Practical: 52 hrs.</b>
		<b>40 marks for Sem end Examination(3 hrs) &amp; 10 marks IA</b>
<b>Total Credits</b>	<b>: 06</b>	<b>Total Theory marks 100 and Practical marks 50</b>

**Chemistry of *s* and *p* Block Elements:**

Diagonal relationship and anomalous behaviour of first member in *s* block elements. Complex formation tendency of *s* and *p* block elements. Structure, bonding, preparation, and uses of boron nitrides, borohydrides (diborane), carboranes, silicates, oxides and oxoacids of nitrogen, peroxy acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens. Bonding in  $XeF_2$ ,  $XeF_4$  and  $XeO_3$ .

**(10 Lectures)**

**Chemistry of *d* and *f* Block Elements:**

**Transition Elements:** General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, ability to form complexes. Stability of various oxidation states. Chemistry of Ti, V, Cr, Mn, Fe and Co in various oxidation states (excluding their metallurgy)

**Lanthanides and Actinides:** Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). Preparation of Trans-uranic elements.

**(10 Lectures)**

**Coordination Chemistry-I:** Werner's theory, IUPAC system of nomenclature, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr, Fe, Co, Ni and Cu (coordination numbers 4 and 6). Drawbacks of VBT.

**(5 Lectures)**

**Nuclear Chemistry:** Nuclear particles (positron, neutrino, mesons, pions and quarks), nuclear instability, Nuclear reactions  $[(\alpha, n), (n, \alpha), (\alpha, p), (p, \alpha), (p, n), \& (n, p)]$ , nuclear fission, nuclear reactor and types of nuclear reactors in India, applications of radioisotopes in tracer technique, and carbon dating (numerical, problems).

**(05Hours)**

**Solutions:** Thermodynamics of ideal solutions: Ideal solutions and Raoult's law, deviations from Raoult's law - non-ideal solutions. Vapour pressure-composition and temperature-composition curves of ideal and non-ideal solutions. Distillation of solutions. Lever rule. Azeotropes. Partial miscibility of liquids: Critical solution temperature; effect of impurity on partial miscibility of liquids. Immiscibility of liquids- Principle of steam distillation.

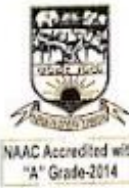
**(6 Lectures)**

**Phase Equilibrium:** Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation. Derivation of Clausius - Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water and sulphur) and two component systems involving eutectics, congruent and incongruent melting points (lead-silver,  $FeCl_3-H_2O$  and Na-K only).

**(8 Lectures)**

**Conductance:** Ionic conductance, ohms law, conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Conductivity cell, measurement of conductance of ionic solution and its applications in : a) determination of degree of ionization of weak electrolyte b) solubility and solubility products of sparingly soluble salts c) ionic product of water d) hydrolysis constant of a salt and e) conductometric titrations of acid- base (numerical problems).

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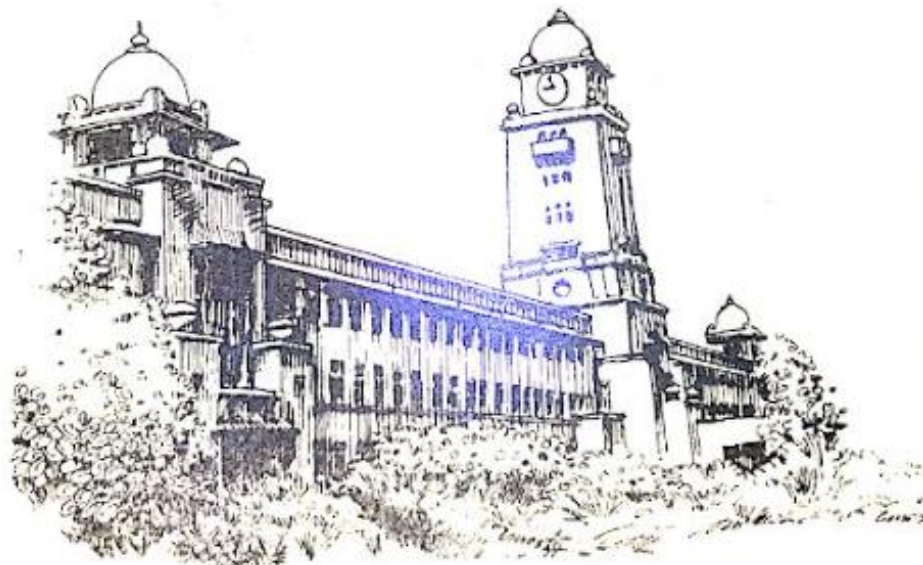


**B.Sc. Programme**

**Regulations & Syllabus for**

**BACHELOR OF COMPUTER SCIENCE (B.Sc. (CS))**

AS DISCIPLINE SPECIFIC COURSE (DSC)  
GENERIC ELECTIVE (GE) and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)



Effect from 2020-21 and onwards

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**SEMESTER - III**

Course	Paper Code	Paper Title Theory/Practical	Credits	No. of Hrs/ Week Theory/ Practical	Total Hours	Duration of Exam in Hrs Theory/ Practical	Internal Assessment Marks Theory/ Practical	Marks for Final Exam Theory/ Practical	Total Marks
AECC	B.Sc.(CS)-3.1	English - 3	3	3	45	3	20	80	100
AECC	B.Sc.(CS)-3.2	MIL - 3	3	3	45	3	20	80	100
DSC	B.Sc.(CS)-3.3	Data Structures using C	4 + 0	4	48	3	20	80	100
DSC	B.Sc.(CS)-3.4	Microprocessor 8085	4 + 0	4	48	3	20	80	100
DSC	B.Sc.(CS)-3.5	Fundamentals of Digital Electronics	3 + 1	4	48	3	20	80	100
DSC	B.Sc.(CS)-3.6	Data Communications	3 + 1	4	48	3	20	80	100
DSC	B.Sc.(CS)-3.7	Data Structures Lab	2	4	48	3	10	40	50
DSC	B.Sc.(CS)-3.8	Microprocessor Lab	2	4	48	3	10	40	50
<b>Total</b>			26	30			140	560	700

**SEMESTER - IV**

Course	Paper Code	Paper Title Theory/Practical	Credits	No. of Hrs/ Week Theory/ Practical	Total Hours	Duration of Exam in Hrs Theory/ Practical	Internal Assessment Marks Theory/ Practical	Marks for Final Exam Theory/ Practical	Total Marks
AECC	B.Sc.(CS)-4.1	English - 4	3	3	45	3	20	80	100
AECC	B.Sc.(CS)-4.2	MIL - 4	3	3	45	3	20	80	100
DSC	B.Sc.(CS)-4.3	Data Base Management System	4 + 0	4	48	3	20	80	100
DSC	B.Sc.(CS)-4.4	JAVA Programming	4 + 0	4	48	3	20	80	100
DSC	B.Sc.(CS)-4.5	Operation Research	3 + 1	4	48	3	20	80	100
DSC	B.Sc.(CS)-4.6	Software Engineering	3 + 1	4	48	3	20	80	100
DSC	B.Sc.(CS)-4.7	DBMS LAB	2	4	48	3	10	40	50
DSC	B.Sc.(CS)-4.8	Java LAB	2	4	48	3	10	40	50
<b>Total</b>			26	30			140	560	700



**Karnatak University, Dharwad**



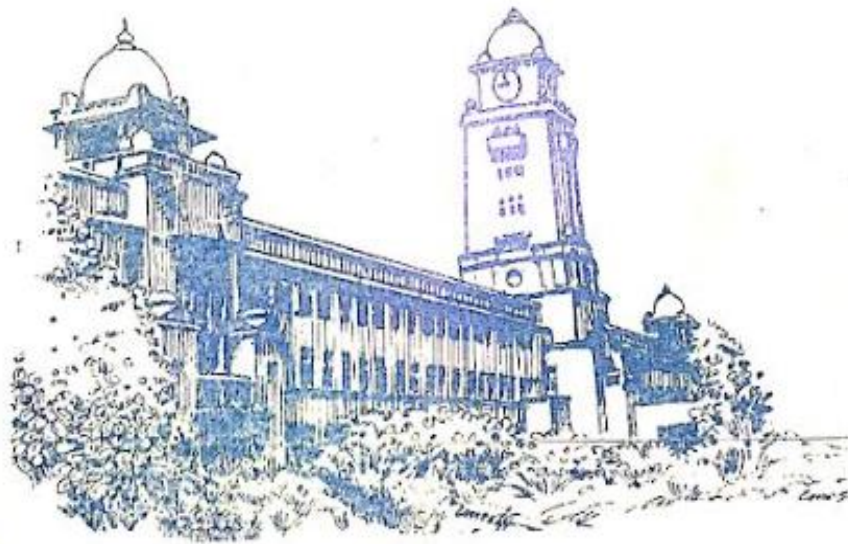
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**B.A. Programme**

**Syllabus for**

**CRIMINOLOGY AND FORENSIC SCIENCE**

AS DISCIPLINE SPECIFIC COURSE (DSC)  
and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)



Effect from 2020-21

**III - Semester: B.Sc Degree programme in Forensic Science and Criminology**  
**DSC – CRIMINAL JUSTICE AND POLICE SCIENCE: FSC-**  
**Th: C**

Marks: IA – 20, Main exam - 80 Total Marks - 100  
Exam Duration: 03 Hrs - Teaching Hours - 04 Hrs/week Credits – 04  
Total number of teaching hours - 60

*Objectives: This paper is designed with objectives of acquainting the students with:*

- d. The Law and principles of Criminal Law.*
- e. Various offences, the punishment and procedure for the offences as mentioned in the Indian Penal Code. Criminal Procedure and Evidence Act*
- f. The Police as an important agency of the Criminal Justice System.*
- d. The powers and duties of Police*
- e. The procedure of investigation and Preventive measures*

**UNIT I: INTRODUCTION**

**12 hours**

- g) Judicial system in India, Importance and reforms in the justice administration.
- h) Meaning, objective and wings of Criminal justice system.
- i) Evolution of Police Administration.
- j) Prosecution organization and its relation with police.
- k) Organizational set up of police in State, Central and special units of police
- l) Salient features of Karnataka Police Act and Police Manual.

**UNIT II: CRIMINAL CODES**

**12 hours**

- g) **General explanation** - man, woman, movable property, dishonesty, fraudulently counterfeit, document, offence, life, death and good faith.
- h) **General exception** – Sec 76,82,83,84,85,87,96,97,103,106 of IPC.
- i) **Indian Penal Code**
  - iii. Offences against persons – Sec 121A, 299, 300, 302, 304A, 304B, 307, 309, 319, 320, 324, 326, 351, 354, 359, 362. Sec 375 & 377 and their amendments.
  - iv. Offences against property Sec – 378, 383, 390, 391, 405, 415, 420, 441, 463, 489A, 497, 499, 503, 511.
- j) **Criminal Procedure Code** -Functionaries under the code: police, prosecutors, defense counsel and prison authorities. Sec 61-69 summons, Sec 70-72 warrant, Sec 154 FIR, Sec 173 Charge sheet , Expert Witness (291 -93 ) and Sec 437 provision of bail.
- k) **Indian Evidence Act** – Evidence and rules of relevancy in brief, Expert witness and Cross examination and re-examination of witnesses. Sect 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, 138, 141.
- l) **Constitution of India** –Preamble and Fundamental Rights Article 20, 21, 22.

**UNIT III: SOCIAL LEGISLATIONS**

**12 hours**

- d) Social legislation – its historical perspective
- e) Narcotic Drugs and Psychotropic Substances Act, Prevention of Food

**IV - Semester: B.Sc Degree programme in Forensic Science and Criminology**  
**DSC – DECTYLOSCOPY AND DNA FINGER PRINTING:**  
**FSC-Th: D**

Marks: IA – 20, Main exam - 80 Total Marks - 100  
Exam Duration: 03 Hrs - Teaching Hours - 04 Hrs/week Credits – 04  
Total number of teaching hours - 60

*Objectives: This paper is designed with objectives of acquainting the students with:*

- a. The history and fundamental principles of fingerprinting.*
- b. Application of Fingerprints as the most infallible means of identification.*
- c. The physical and chemical techniques of developing fingerprints on crime scene evidence.*
- d. The significance of foot and tyre prints.*
- e. The forensic significance of DNA typing.*
- f. The importance of short tandem repeats and restriction fragment length polymorphism in DNA technique.*

**UNIT I: BASICS OF FINGERPRINTING** **12 hours**

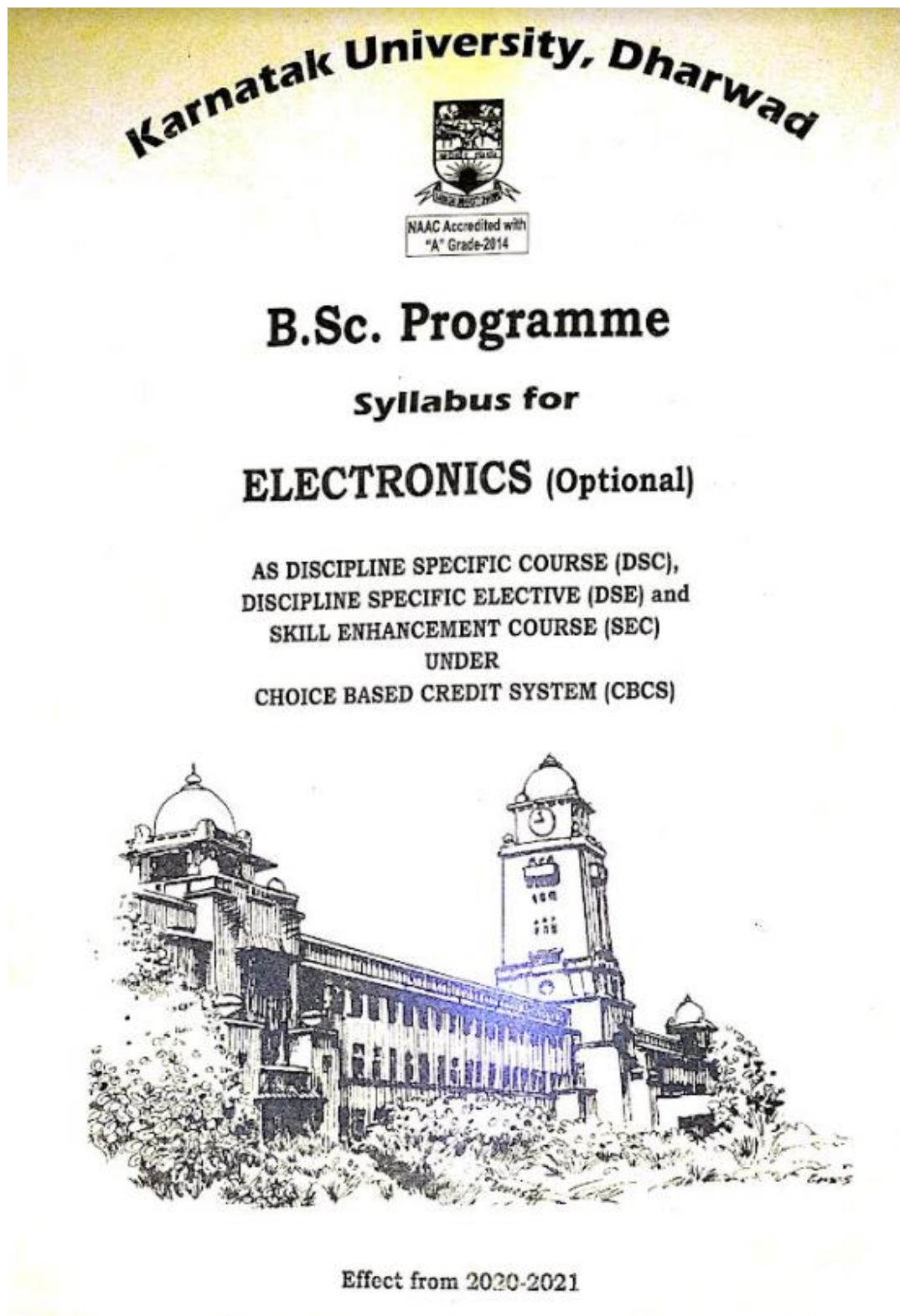
- a. History and development of finger prints as an identification science
- b. Central and State finger print bureau.
- c. Formation of ridges.
- d. Fundamental principles and characteristics of fingerprinting.

**UNIT II: COMPARISON AND CLASSIFICATIONS** **12 hours**

- a. Recording of finger prints, Taking of finger prints from living and dead persons (Plain and rolled prints).
- b. Identification and Comparison of finger prints.
- c. Henry's primary and secondary classification; Battley's single digit classification.
- d. Significance of poroscopy and edgeoscopy.

**UNIT III: LATENT FINGERPRINTS** **12 hours**

- a. Developing Latent fingerprints detection by physical techniques - Grey, Graphite and Anthracene powder.
- b. Mechanism of detection of fingerprints by different Chemical techniques: Ninhydrin and its analogue silver nitrate, fuming method - Iodine, Vacuum Metal Deposition (VMD) Method.
- c. Automated Fingerprint Identification System (AFIS) and application of light sources in fingerprint detection.
- d. Preserving and lifting of fingerprints, Photography of fingerprints, digital transmission, application of laser technologies, Biological methods of development of latent prints on skin.



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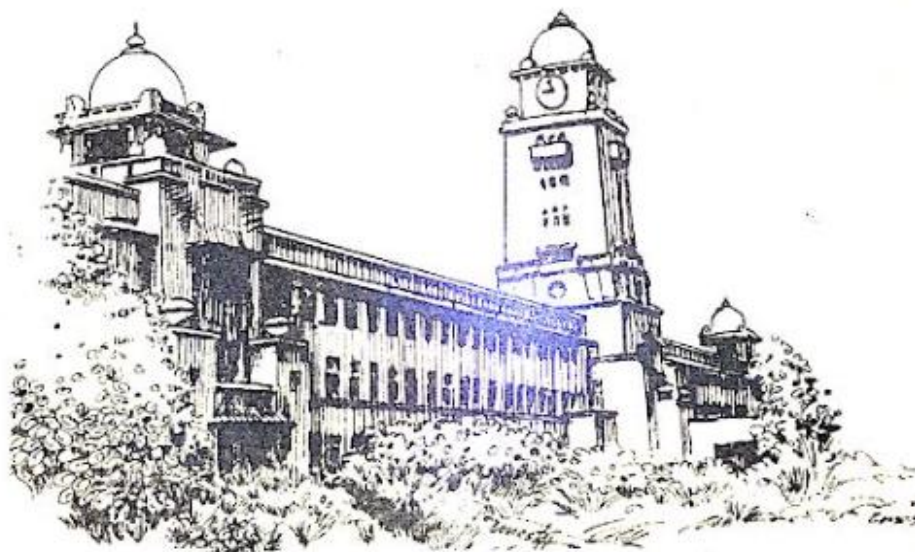
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## **B.Sc. Programme**

**Syllabus for**

### **ELECTRONICS (Optional)**

**AS DISCIPLINE SPECIFIC COURSE (DSC),  
DISCIPLINE SPECIFIC ELECTIVE (DSE) and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)**



**Effect from 2020-2021**

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**Discipline Specific Course(DSC), Discipline Specific Elective and Skill Enhancement Course Topics under CBCS in Electronics**

Sem	Type	Course
1	DSC ELET:101	BASIC ELECTRONICS
	DSC ELEP:102	PRACTICALS 1
2	DSC ELET:201	LINEAR AND DIGITAL INTEGRATED CIRCUITS
	DSC ELEP:202	PRACTICALS 2
3	DSC ELET:301	COMMUNICATION ELECTRONICS
	DSC ELEP:302	PRACTICALS 3
4	DSC ELET:401	PHOTONICS AND MICROCONTROLLER
	DSC ELEP:402	PRACTICALS 4
5	DSE ELET:501A OR ELET:501B	C-Programming, VLSI and Embedded System (Elective)  OR Sensors,C-Programming and Embedded System (Elective2)
	DSE ELEP:502A OR ELEP:502B	PRACTICALS 5
	SEC-1 ELEP:503	EMBEDDED SYSTEMS EXPERIMENTS USING MICROCONTROLLER/ARDUINO PRACTICALS 6
	SEC-2 ELEP:504	PCB DESIGN AND SIMULATION EXPERIMENTS PRACTICALS 7
6	DSE ELET:601A OR ELET:601B	Power Electronics and DSP (Elective 1) OR Power Electronics VLSI,VHDL and Python (Elective 2)
	DSE ELEP:602A OR ELEP:602B	PRACTICALS 8
	SEC-1 ELEP:603	PC HARDWARE AND BASIC NETWORKING CONCEPTS PRACTICALS 9
	SEC-2 ELEP:604	PROJECT WORK PRACTICALS 10

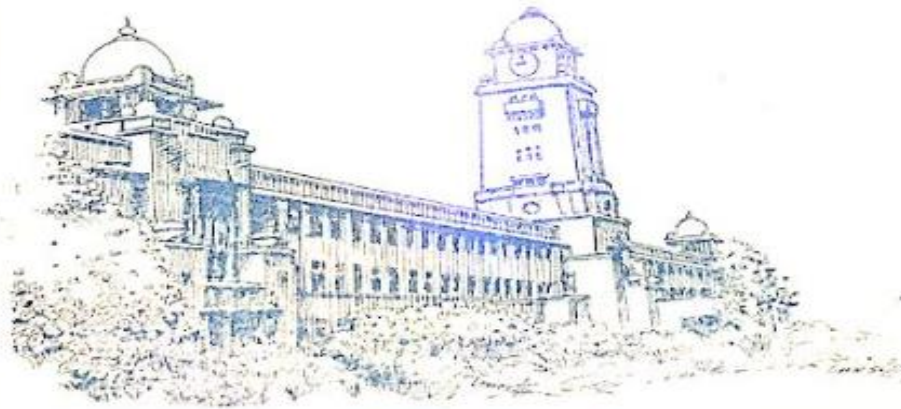
**KARNATAK UNIVERSITY, DHARWAD**



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**SYLLABUS FOR  
B.Sc. GEOLOGY (GENERAL)**

**VI- SEMESTER COURSE  
UNDER CHOICE BASED CREDIT SYSTEM (CBCS)**



**2020-21 Onwards**

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

Karnatak University, Dharwad  
CBCS syllabus for Under Graduate Programme in Geology (opt.) as **DISCIPLINE SPECIFIC COURSE (DSC)**  
Effective from 2020-21

Semester	Course Code	Name Of The Course	Theory/ Practical	Instruction Hrs/Week	Total Period	Duration Of Exam	Marks Obtained		Total Marks	Credits
							Internal (CA)	External (ESE)		
I	(DSC) GLG-SCT-(A)-116	General Geology and Structural Geology	Theory	04	60	03 Hrs	20	80	100	04
	(DSC) GLG-SCP-(A)-116	General Geology and Structural Geology	Practical	04	52	03 Hrs	10	40	50	02
II	(DSC) GLG-SCT-(B)-226	Crystallography and Mineralogy	Theory	04	60	03 Hrs	20	80	100	04
	(DSC) GLG-SCP-(B)-226	Crystallography and Mineralogy	Practical	04	52	03 Hrs	10	40	50	02
III	(DSC) GLG-SCT-(C)-336	Petrology	Theory	04	60	03 Hrs	20	80	100	04
	(DSC) GLG-SCP-(C)-336	Petrology	Practical	04	52	03 Hrs	10	40	50	02
IV	(DSC) GLG-SCT-(D)-446	Stratigraphy and Palaeontology	Theory	04	60	03 Hrs	20	80	100	04
	(DSC) GLG-SCP-(D)-446	Stratigraphy and Palaeontology	Practical	04	52	03 Hrs	10	40	50	02
V	(DSE) *GLG-DET-516- (E)-P-I/P-II	P-I-Economic Geology and Hydrogeology P-II- Geology of Karnataka	Theory	04 / 04	60 / 60	03 Hrs	20	80	100	04
	(DSE) GLG-DEP-516- (E)-P-I/P-II	P-I-Economic Geology and Hydrogeology P-II	Practical	04	52	03 Hrs	10	40	50	02
VI	(DSE) *GLG-DET-626- (F)P-I / P-II	P-I-Elements of Applied Geology P-II- Dissertation/ Project Work	Theory/ Self Study	04 / 04	60 / 60	03 Hrs	20	80	100	04
	(DSE) GLG-DEP-626- (F)P-I/P-II	P-I-Elements of Applied Geology P-II- Dissertation/ Project Work	Practical	04	54	03 Hrs	10	40	50	02
Total	*Candidate shall choose either Paper-I or P-II but not both in DSE Theory			48 Hrs	672/120		180	720	900	36

**Karnatak University, Dharwad**



**B.A. Programme**  
**Syllabus for**  
**GEOGRAPHY (OPTIONAL)**

AS DISCIPLINE SPECIFIC COURSE (DSC)  
and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)



Effect from 2020-2021



1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**Karnatak University, Dharwad**  
**CBCS syllabus for Under Graduate Programme in Geography (opt.) as**  
**DISCIPLINE SPECIFIC COURSE (DSC)**  
 Effective from 2020-21

Sem Ester	Theory/ Practical	Subject Code	Instruction hour per week	Total Syllabus Hrs/ Sem	Duration of Exam.	Internal Assessment Marks	Sem final Exam. Marks	Total Marks	Credits
I	Theory	DSC (GYT: A)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (GYPr: A)	04 hrs	52	03 hrs	10	40	50	02
II	Theory	DSC (GYT: B)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (GYPr: B)	04 hrs	52	03 hrs	10	40	50	02
III	Theory	DSC (GYT: C)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (GYPr: C)	04 hrs	52	03 hrs	10	40	50	02
IV	Theory	DSC (GYT: D)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (GYPr: D)	04 hrs	52	03 hrs	10	40	50	02
V	*Theory P-I /P- II	DSE (GYT: E-I GYT: E-II)	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE (GYPr: E)	04 hrs	52	03 hrs	10	40	50	02
VI	*Theory P-I /P- II	DSE (GYT: F-I GYT: F-II)	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE (GYPr: F)	04 hrs	52	03 hrs	10	40	50	02
Total			48 hrs	672/120		180	720	900	36

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**Particulars of the Semester wise Theory and Practical Papers and Paper Code of B.A. Course.**

Semester	Paper Code	Title of the Paper	Course
I	GY T A	Physical Geography	DSC
	GY Pr. A	Scale and Maps	DSC
II	GY T B	Human Geography	DSC
	GY Pr. B	Interpretation of Indian Daily Weather Maps	DSC
III	GY T C	Regional Geography of Karnataka	DSC
	GY Pr. C	Interpretation of Topographical Maps	DSC
IV	GY T D	Environmental Geography	DSC
	GY Pr. D	Map Projections	DSC
V	GY T E-I	Regional Geography of India	DSE
	GY T E-II	Geography of Settlements	DSE
	GY Pr. E	Basic Statistics	DSE
	GY T E-III	Elements of Physical Geography	GE-I
	GY T E-IV	Regional Planning & Development	SEC-I
VI	GY T F-I	Economic Geography of the World	DSE
	GY T F-II	Population Geography	DSE
	GY Pr. F-I	Field Based Project report	DSE
	GY T F-III	Physical Geography of India	GE-II
	GY T F-IV	Basics of Remote Sensing	SEC-II

Note: All the DSC Courses are compulsory. Each DSE shall have at least two papers and student shall choose any one paper from each DSE and Practical is compulsory.

SEC Theory/Practical is compulsory of these two semesters.

The Practical batch is to be in accordance with University Norms.

**Karnatak University, Dharwad**



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# **B.Sc. Programme**

**Syllabus for**

## **GENETICS (OPT.)**

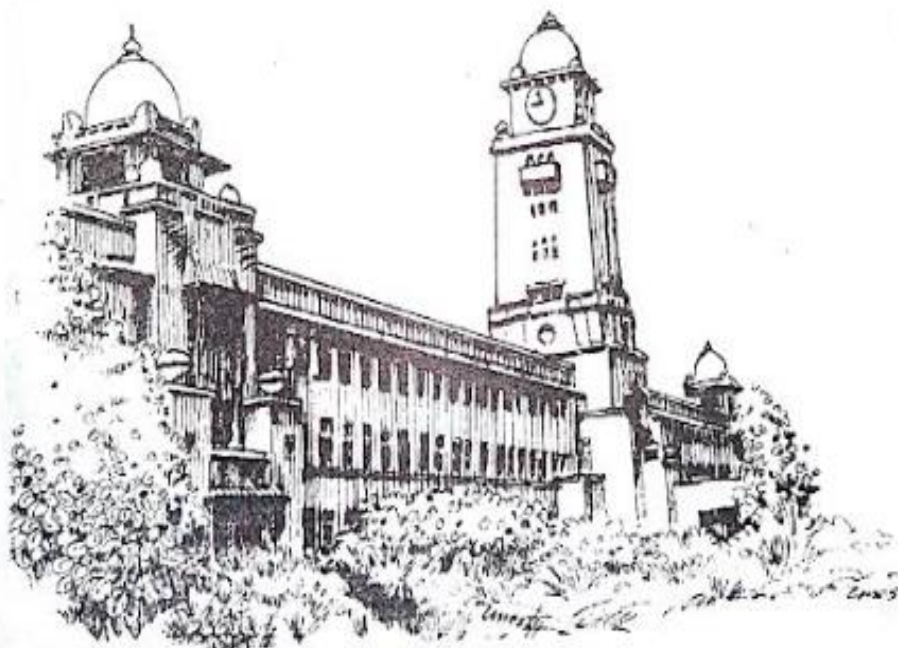
**AS DISCIPLINE SPECIFIC COURSE (DSC)**

**and**

**SKILL ENHANCEMENT COURSE (SEC)**

**UNDER**

**CHOICE BASED CREDIT SYSTEM (CBCS)**



**Effect from 2020-2021**

**Discipline Specific Course (DSC)  
Discipline Specific Elective (DSE)  
Skill Enhancement Course (SEC)**

**Topics under CBCS in GENETICS.**

<b>Sem</b>	<b>Paper Code</b>	<b>Course</b>
1	DSC GENT:101	<b>CYTOGENETICS</b>
	DSC GENP:102	<b>Practical 1</b>
2	DSC GENT:201	<b>MENDELIAN GENETICS</b>
	DSC GENP:202	<b>Practical 2</b>
3	DSC GENT:301	<b>MOLECULAR BIOLOGY</b>
	DSC GENP:302	<b>Practical 3</b>
4	DSC GENT:401	<b>MOLECULAR GENETICS</b>
	DSC GENP:402	<b>Practical 4</b>
5	DSE GENT:501A OR GENT:501B	<b>GENERAL GENETICS OR BIostatISTICS AND BIOINFORMATICS</b>
	DSE GENP:502 (Based on 501A+501B)	<b>Practical 5 (Common for both DSE GENT: 501A and 501B)</b>
	SEC GENP:503	<b>Practical 6 CELL BIOLOGY TECHNIQUES</b>
6	DSE GENT:601A OR GENT:601B	<b>ADVANCED GENETICS OR GENETIC ENGINEERING</b>
	DSE GENP:602 (Based on 601A+601B)	<b>Practical 7 (Common for both DSE GENT: 601A and 601B)</b>
	SEC GENP:603	<b>Practical 8 APPLIED GENETICS</b>

**Karnatak University, Dharwad**



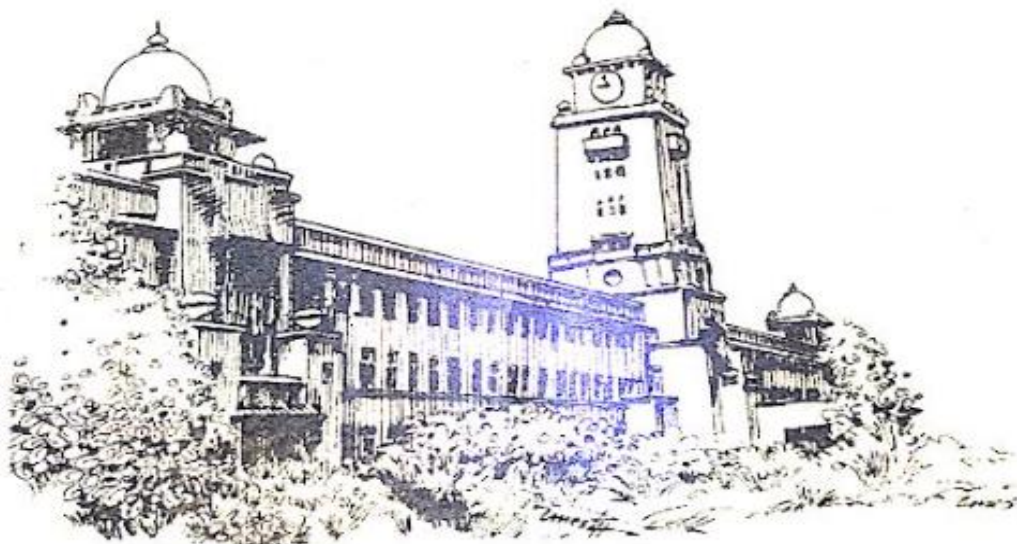
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**B.Sc. PROGRAMME (General)**

UNDER

CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus for the Subject  
**Industrial Fish and Fisheries (IF)**



With Effect from 2020-21

**Karnatak University, Dharwad**  
**B. Sc. (General) CBCS syllabus for Under Graduate Programme**  
**Subject :- Industrial Fish and Fisheries**  
**Effective from 2020-21**

Sem ester	Theory/ Practical	Subject Code	Instruct hrs/wk	Syllabus hrs/ Sem	Duration of Exam.	Internal Assessment Marks	Sem final Exam. Marks	Total Marks	Credits
I	Theory	DSC (IF-Th: A)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (IF-Pr: A)	04 hrs	52	03 hrs	10	40	50	02
II	Theory	DSC (IF-Th: B)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (IF-Pr: B)	04 hrs	52	03 hrs	10	40	50	02
III	Theory	DSC (IF-Th: C)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (IF-Pr: C)	04 hrs	52	03 hrs	10	40	50	02
IV	Theory	DSC (IF-Th: D)	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (IF-Pr: D)	04 hrs	52	03 hrs	10	40	50	02
V	*Theory P-I /P- II	DSE (IF-Th P-I E IF-Th: P-II E)	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE (IF-Pr: E)	04 hrs	52	03 hrs	10	40	50	02
VI	*Theory P-I /P- II	DSE (IF-Th P-I F IF-Th: P-II F)	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE (IF-Pr: F)	04 hrs	52	03 hrs	10	40	50	02
<b>Total</b>						<b>180</b>	<b>720</b>	<b>900</b>	<b>36</b>

\*Candidate shall choose either paper -I or P-II but not both in DSE theory.

**SKILL ENHANCEMENT COURSE (SEC) for Industrial Fish and Fisheries opted as DSC**

Sem ester	Theory	Subject Code	Instructi on hour per week	Total Syllabus Hrs/ Sem	Duration of Exam.	Internal Assessment Marks	Sem final Exam. Marks	Total Marks	Credits
V	Theory	(SEC-IF- 1E)	02 hrs	30	1.5 hrs	10	40	50	02
V	Theory	(SEC-IF- 2E)	02 hrs	30	1.5 hrs	10	40	50	02
VI	Theory	(SEC-IF- 1F)	02 hrs	30	1.5 hrs	10	40	50	02
VI	Theory	(SEC-IF- 2E)	02 hrs	30	1.5 hrs	10	40	50	02
<b>Total</b>			<b>08 hrs</b>	<b>120</b>		<b>40</b>	<b>160</b>	<b>200</b>	<b>08</b>

### B.Sc. Semester - III

**DSC -INDUSTRIAL FISH AND FISHERIES: IF-Th: C**  
**Credits: I. Theory : 04** Theory class 4hrs /wk. Total theory: 60 Lectures  
 80 marks for Sem end Examination (3 hrs) & 20 marks IA  
**II. Practical : 02** Practical: 4 hrs./wk. Total Practical: 52 hrs.  
 40 marks for Sem end Examination (3 hrs) & 10 marks IA  
**Total Credits : 06** Total Theory marks 100 and Practical marks 50

#### Syllabus:

#### Capture Fisheries

**CAPTURE FISHERIES;** Importance of capture fisheries of the World. Present yield and estimate of potential fisheries. International fisheries commissions. The Inland capture fisheries resource of world and India. Riverine fisheries. Fisheries of major and minor carps, catfishes and other groups. Problems and managements. 10 hrs

Coldwater fisheries resources; Fisheries of trout, Mahaseer and other coldwater fish species. Development and management. 10 hrs

Lacustrine fisheries sources, potentials and problems of development and management. 5 hrs

Estuarine fisheries resource; fishes of clupeoids, prawns, molluscs, mullets and other important groups. Fisheries of brackishwater lakes and backwaters. 10 hrs

**Capture fishers fisheries of marine;** Marine fisheries resources of India. Pelagic fisheries; Fisheries of Oil sardines, Lesser sardines, Anchovies, Clupeoids, Mackerels, Ribbon fisheries, Tunas, Seer fish, Carangids and Cephalopods. 10 hrs

**Mid water and demersal fisheries;** Fisheries of elasmobranches, Bombay duck, Catfishes, Silver bellies, Sclaenids, Pomfrets, Threadfins, Perches, Flatfish, Prawns, Lobsters, Crabs, Mussels, Oysters and Clams and their economic importance. Fishing regulatory and Laws. 15 hrs

#### INDUSTRIAL FISH AND FISHERIES LAB: IF-Pr: C

#### Syllabus and distribution of marks in the practical Examination

##### III SEMESTER PRACTICAL

4 hrs/ week

1. Freshwater fish gears and crafts. (03 Practicals)
2. Marine water gears and crafts. (03 Practicals)
3. Length and weight relationship in fishes. (03 Practicals)
4. Population structure and Length frequency data in fishes. (02 Practicals)
5. Compulsory Field Visit to marine fish landing centre, beach etc., (Carries 10 marks for Field Report)

#### SCHEME OF PRACTICAL EXAMINATION

- |   |          |
|---|----------|
| 1. Length and weight relationship in fishes                           | 10 marks |
| 2. Population structure and frequency data                            | 05 marks |
| 3. Identification of gears and crafts 5X2                             | 10 marks |
| 4. Field visit Report and Viva (7+3)<br>(Compulsory study tour visit) | 10 marks |
| 5. Journals   | 05 marks |

.....  
**Total 40 marks**

### **B.Sc. Semester - IV**

#### **DSC- INDUSTRIAL FISH AND FISHERIES: IF-Th: D**

<b>Credits: I. Theory : 04</b>	<b>Theory class 4hrs /wk. Total theory: 60 Lectures</b>
	<b>80 marks for Sem end Examination(3 hrs) &amp; 20 marks IA</b>
<b>II. Practical : 02</b>	<b>Practical: 4 hrs./wk. Total Practical: 52 hrs.</b>
	<b>40 marks for Sem end Examination(3 hrs) &amp; 10 marks IA</b>
<b>Total Credits : 06</b>	<b>Total Theory marks 100 and Practical marks 50</b>

#### **Syllabus**

##### **FISHERIES TECHNOLOGY:**

Principles and importance of fish preservation – Sun drying, Salt curing, Pickling, Smoking, Chilling, Frying and Canning.

Processing and preservation of fish products and byproducts. Paste products, Minced meat, Fish Protein Concentrate, Fish meal, Shark liver oil, Fish body oil, Liquid fish (fish ensilage), Shark fins and fin rays, Fish skin leather, Ambergris, Fish cake, Fish salads, Fish wafers, Fish soup powder, Fish hydrolysate, Fish Sauce, Fish glue, Isinglass, Chitin and Chitosan, Pearl essence, béche-de-mer. **25 hrs**

Sea weeds – Edible, Industrial and Pharmaceutical products and their uses. **05 hrs**  
Handling, preservation and transportation of fresh fish, freezing preservation of fish, modern techniques employed in fish preservations **05 hrs**

Sanitation in processing and quality control of fresh and processed fish and fisheries products. **05 hrs**

**Fish catching methods;** Indigenous fishing gears of India. Recent development in fishing gears in India. Indigenous fishing crafts of India. Mechanization of Indian fishing crafts, fishing vessels. Electronics in fishing industry. Sea fishing methods. **10 hrs**

**Pearl producing molluscs;** Freshwater and marine pearl producing molluscs. Pearl formation. Pearl production states in India. **05 hrs**

**Fisherman Co-operative Societies;** Roll of co-operative in fishery economy. Organization of fisherman Co-operative society. Roll of Co-operative Societies in fish production and marketing. Fisheries extension. **05 hrs**

#### **INDUSTRIAL FISH AND FISHERIES LAB: IF-Pr: D**

##### **Syllabus and distribution of marks in the practical Examination**

##### **IV SEMESTER PRACTICALS**

**4Hrs/week**

1. Study of By-products and their economic importance. (Fish wafers, Soup powder, Fish Ensilage, Isinglass, fish pickle, Shark fin and fin rays, fish body oil, Chitin and Chitosan, Fish sauce, Fish cake, FPC) etc., (07 Practicals)
2. Preparation of Chitosan from prawn shells
3. Extraction of fish body oil and liver oil (02 Practicals)
4. Fish Food formulation and pellet preparation
5. Compulsory visit to cold storages, Fisheries Institutes and processing plants and fish landing centre and submission of study tour reports.



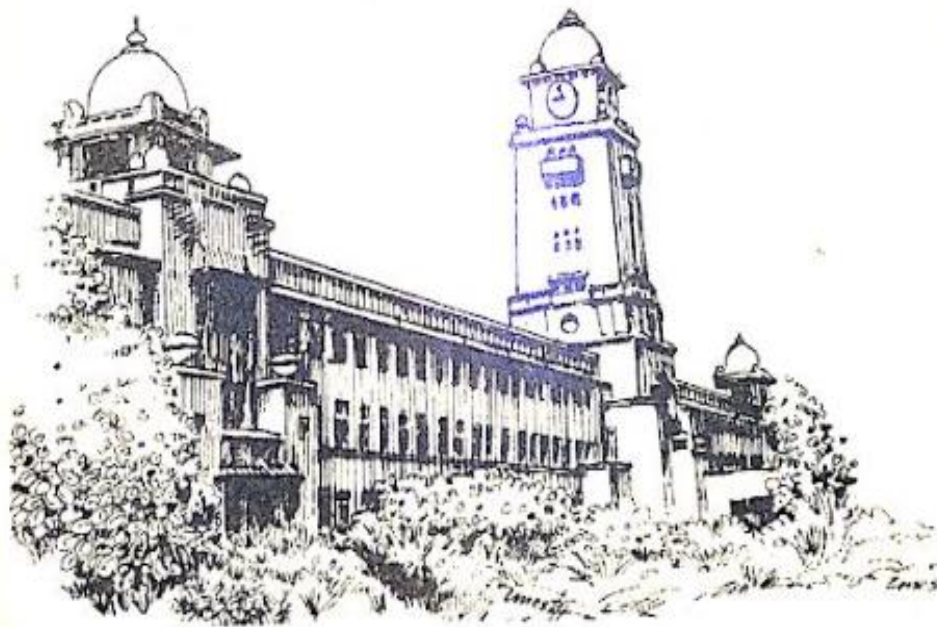
**Karnatak University, Dharwad**



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**B.Sc. Degree Course  
Proposed Syllabus for  
MATHEMATICS**

**UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)**



**With effect from 2020-21 and onwards**

## Karnatak University, Dharwad

### B. Sc. Mathematics Syllabus under Choice Based Credit System(CBCS)

Karnatak University is proposed to introduced to Choice Based Credit System(CBCS) for B. Sc. Programme from the academic year 2020-21. Proposed syllabus has been prepared as per the guidelines. The Board of Studies in Mathematics has prepared this syllabus.

#### B. Sc. Mathematics Programme Course Matrix for Semester I-IV Discipline Specific Course(DSC)

Sem	Title of the Course	Type of instruction & hours per week/course $4=(3L+1T)$	Credits	Hours of Exam(SEE) Per Course /Sem.	Max. Marks For LA per Course/Sem.	Max. Marks For SEE per Course/Sem.	Max. Marks per Course/Sem.
I	BMDSC Paper 1.1 Differential Calculus-I	4	3	3	15	60	150
	BMDSC Paper 1.2 Algebra	4	3	3	15	60	
II	BMDSC Paper 2.1 Differential Calculus-II	4	3	3	15	60	150
	BMDSC Paper 2.2 Integral Calculus And Geometry	4	3	3	15	60	
III	BMDSC Paper 3.1 Number Theory and Group Theory	4	3	3	15	60	150
	BMDSC Paper 3.2 Analysis and Trigonometry	4	3	3	15	60	
IV	BMDSC Paper 4.1 Sequences and Series	4	3	3	15	60	150
	BMDSC Paper 4.2 Vector Calculus and Differential Equations	4	3	3	15	60	

SEE : Semester end exam

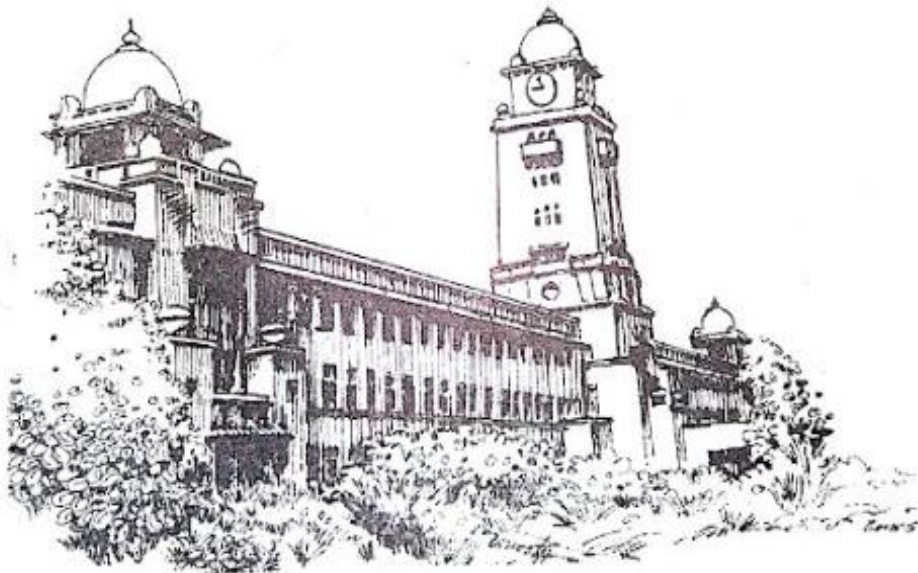
**Karnatak University, Dharwad**



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**Syllabus and Structure**  
**For**  
**B.Sc. MICROBIOLOGY**

**UNDER**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**



With Effect from 2020-2021 onwards

**B.Sc. Microbiology**  
**Proposed Semester-wise distribution of the course structure**

**Effective from 2020-21**

Sl. No.	Code No.	Type of the Paper	Title of the Paper	Credit Pattern in L:T:P	Credit Value	Hours /Week L:T:P
<b>Semester – I</b>						
1	MB-1.1	DSC	Microbiology and Microbiological Techniques	4:0:2	6	4:0:4
<b>Semester – II</b>						
1	MB-2.1	DSC	Microbial Physiology and Genetics	4:0:2	6	4:0:4
<b>Semester – III</b>						
1	MB-3.1	DSC	Molecular Biology and Genetic Engineering	4:0:2	6	4:0:4
<b>Semester – IV</b>						
1	MB-4.1	DSC	Environmental and Agricultural Microbiology	4:0:2	6	4:0:4
<b>Semester – V</b>						
<b>Any one of following</b>						
1	MB-5.1	DSE 1.1	Food and Industrial Microbiology	4:0:2	6	4:0:4
2	MB-5.2	DSE 1.2	Microbial Biotechnology and Bioinformatics	4:0:2	6	4:0:4
<b>Any one of following</b>						
1	SEC-1.1	Discipline specialization	Microbial Quality Control in Food and Industries	2:0:0	2	2:0:0
2	SEC-1.2	Discipline specialization	Microbiological analysis of air and water	2:0:0	2	2:0:0
<b>Semester – VI</b>						
<b>Any one of following</b>						
1	MB-6.1	DSE 1.1	Immunology and Medical Microbiology	4:0:2	6	4:0:4
2	MB-6.2	DSE 1.2	Advances in Microbiology and Biostatistics	4:0:2	6	4:0:4
<b>Any one of following</b>						
1	SEC-2.1	Discipline specialization	Microbial diagnosis in Health Clinics	2:0:0	2	2:0:0
2	SEC-2.2	Discipline specialization	Microbial Infections and Treatment	2:0:0	2	2:0:0

- DISCIPLINE SPECIFIC COURSE- DSC
- DISCIPLINE SPECIFIC ELECTIVE-DSE
- SKILL ENHANCEMENT COURSE –SEC
- L-Lecture T-Tutorial P-Practical

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

Discipline Specific Course(DSC), Discipline Specific Elective and Skill Enhancement Course Topics under CBCS in Physics.

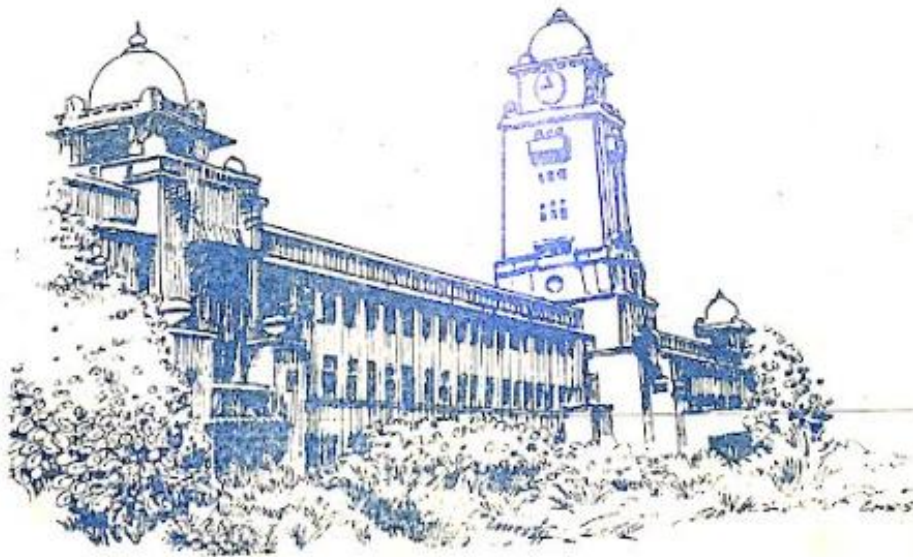
Se m	Type	Course
1	DSC PHYT:101	<b>Mechanics and properties of Matter</b> Newtonian Mechanics, Classical Mechanics, Special Theory of Relativity, Gravitation and Elasticity
	DSC PHYP:102	<b>Practicals 1</b>
2	DSC PHYT:201	<b>Thermal Physics and Fluid Mechanics</b> Thermodynamics, Kinetic theory of gases, Statistical Physics, Radiation, Astrophysics, Surface Tension and Viscosity
	DSC PHYP:202	<b>Practicals 2</b>
3	DSC PHYT:301	<b>Electrostatics and Electricity</b> Dielectrics, Transients, Alternating Current, Electrical instruments and measurements, Electromagnetic induction and Thermoelectricity
	DSC PHYP:302	<b>Practicals 3</b>
4	DSC PHYT:401	<b>Electromagnetic theory and Optics</b> Electromagnetic theory, Geometrical optics, Interference, Diffraction and Polarisation
	DSC PHYP:402	<b>Practicals 4</b>
5	DSE PHYT:501A OR PHYT:501B	<b>Modern Physics-I</b> Quantum Mechanics, Spectroscopy and Nuclear Physics OR <b>Modern Physics-II</b>
	DSE PHYP:502	<b>Practicals 5</b>
	SEC-1E PHYP:503	<b>Basic instrumentation skills-I</b> <b>Practicals 6</b>
	SEC-2E PHYP:504	<b>Basic instrumentation skills-II</b> <b>Practicals 7</b>
6	DSE PHYT:601A OR PHYT:601B	<b>Solid State Physics and Electronics-I</b> Crystal structure, Specific heats, Semiconductors, Magnetic Materials, Superconductivity, BJT, FET, IC's, Digital electronics and Communication. OR <b>Solid State Physics and Electronics-II</b>
	DSE PHYP:602	<b>Practicals 8</b>
	SEC-1F PHYP:603	<b>Applied Physics-I</b> <b>Practicals 9</b>
	SEC-2F PHYP:604	<b>Applied Physics-II</b> <b>Practicals 10</b>

**Karnatak University, Dharwad**



**B.Sc. Programme**  
**Syllabus for**  
**STATISTICS (OPTIONAL)**

AS DISCIPLINE SPECIFIC COURSE (DSC)  
DISCIPLINE SPECIFIC ELECTIVE (GE) and  
SKILL ENHANCEMENT COURSE (SEC)  
UNDER  
CHOICE BASED CREDIT SYSTEM (CBCS)



Effect from 2020-2021

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

Karnatak University, Dharwad

CBCS syllabus for Under Graduate Programme in Statistics (opt.) as **DISCIPLINE SPECIFIC COURSE (DSC)**

Effective from 2020-21

Part A Structure: DSC

Sem ester	Theory/ Practical	Subject Code	Title of the Paper	Instruction hour per week	Total Syllabus Hrs/Sem	Duration of Exam.	Internal Assessment Marks	Sem final Exam. Marks	Total Marks	Credits
I	Theory	DSC (STT: A)	Descriptive Statistics and Elements of Probability	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (STPr: A)	Practicals based on theory using Excel and R-programming	04 hrs	52	03 hrs	10	40	50	02
II	Theory	DSC (STT: B)	Mathematical Expectation, Theoretical Distributions and Order Statistics	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (STPr: B)	Practicals based on theory using R-programming	04 hrs	52	03 hrs	10	40	50	02
III	Theory	DSC (STT: C)	Theory of Sampling and Estimation	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (STPr: C)	Practicals based on theory using R-programming	04 hrs	52	03 hrs	10	40	50	02
IV	Theory	DSC (STT: D)	Exact Sampling Distributions and Testing of Statistical Hypothesis	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC (STPr: D)	Practicals based on theory using R-programming	04 hrs	52	03 hrs	10	40	50	02
Total of DSC				32 hrs	448		120	480	600	24

**KARNATAK UNIVERSITY, DHARWAD**



*CBCS SYLLABUS*

*For*

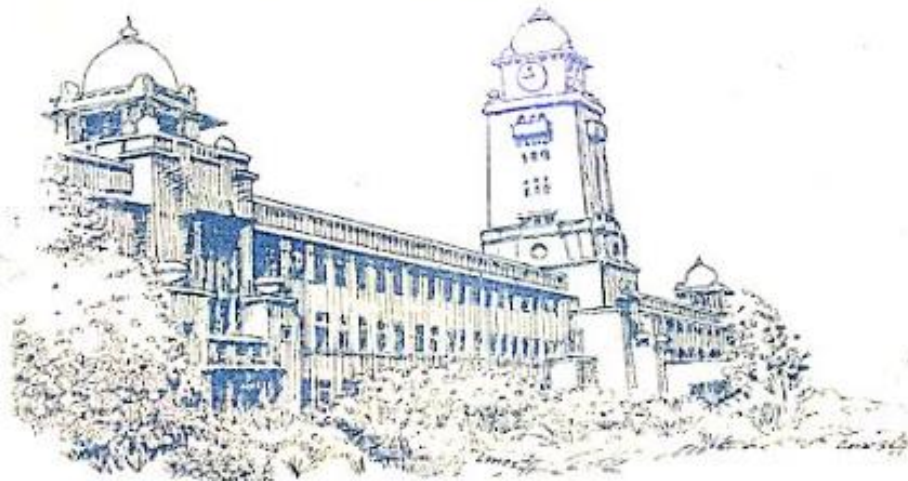
***BACHELOR OF SCIENCE***

**ZOOLOGY**

**(I to IV Semesters)**

**FROM**

**2020-21 & ONWARDS**





### III SEMESTER

#### PAPER DSCZOOT 3.1: HISTOLOGY, EVOLUTION, PALEONTOLOGY AND BIostatISTICS

Credits:04

Total Teaching Hours: 60hrs

I	<b>HISTOLOGY</b>	20 hrs
	Study of histological structure and functions of the following mammalian organs	
	a. Tongue	
	b. Stomach	
	c. Intestine	
	d. Testis	
	e. Ovary	
	f. Liver	
	g. Islets of Langerhans	
	h. Thyroid	
	i. Kidney	
	j. Adrenal	
II	<b>EVOLUTION</b>	18 hrs
	Origin of earth, origin of life, theories of organic evolution. Lamarckism, <i>Darwin Wallace</i> Theory of natural selection Evidences in favor of evolution.	
	Neo-Darwinism (synthetic theory of evolution, gene mutation, gene flow, genetic drift, <i>Hardy Weinberg</i> equilibrium) concept of species Speciation, allopatric and sympatric species	
III	<b>PALEONTOLOGY</b>	15 hrs
	Geological time scales, fossils and fossilization. Radiometric dating – detection of age of fossils. Indian fossil sites. Mesozoic reptiles. Connecting links, living fossils, origin and evolution of man, Evolution of horse.	
IV	<b>BIostatISTICS</b>	07 hrs
	Use of statistics in life sciences, data collection, observations and variables, sampling and sampling methods, representation, tabular and graphical representations; frequency tables, line graphs, bar graphs, histograms, frequency polygon and curve and pie charts; measure of central tendency; mean; median and mode. Measures of dispersion; range, standard deviation; Standard error	

**IV SEMESTER  
PAPER DSCZOOT 4.1: BIOCHEMISTRY AND PHYSIOLOGY**

**Credits: 04**

**Hours: 60 hrs**

**Total Teaching**

<b>I</b>	<b>CARBOHYDRATES, PROTEINS and LIPIDS</b> Definition, classification and biological significance.	<b>09 hrs</b>
<b>II</b>	<b>ENZYMES</b> Classification of enzymes – IUB system, mechanism of enzyme action, enzyme substrate complex, specificity of enzymes, reversibility of enzyme action, enzyme inhibitors, a brief account of coenzymes, cofactors and ions, clinical importance of enzymes	<b>06 hrs</b>
<b>III</b>	<b>NUCLEIC ACIDS</b> Nucleotides, nucleosides, nitrogen bases, structure of nucleic acid (DNA & t-RNA).	<b>03hrs</b>
<b>IV</b>	<b>VITAMINS</b> Fat soluble vitamins (A, D, E and K) water soluble vitamins (B-complex and C) functions and deficiency symptoms	<b>04hrs</b>
<b>V</b>	<b>BIOENERGETICS</b> Concept of bioenergetics, energy yielding pathways, glycolysis, bioenergetics of glycolysis, the Krebs's cycle, bioenergetics of Krebs's cycle, the electron transportsystem, phosphorylation	<b>04 hrs</b>
<b>VI</b>	<b>DIGESTION</b> Mechanical digestion, chemical digestion, assimilation and absorption of proteins, carbohydrates and lipids. Hormonal regulation of enzyme secretion	<b>03 hrs</b>
<b>VII</b>	<b>RESPIRATION</b> External and internal respiration. Respiratory pigments, hemoglobin, hemocyanin and hemerythrin. Physiology of respiration, exchange of gases, transport of oxygen, oxygen dissociation curves, Bohr Effect, transport of carbon dioxide, chloride shift, respiratory quotient	<b>03 hrs</b>
<b>VIII</b>	<b>CIRCULATION</b> Types of circulation, structure, functions and regulation of human heart, blood pressure, Composition of human blood, Neurogenic and myogenic hearts	<b>03 hrs</b>
<b>IX</b>	<b>NITROGEN EXCRETION</b> Nitrogen excretion in aquatic terrestrial and aerial animals; ammonotelism, ureotelism and uricotelism with examples; ornithine cycle, physiology of urine formation in man	<b>04 hrs</b>
<b>X</b>	<b>MUSCLE CONTRACTION</b> Principal types of muscles, ultra-structure of striated muscles, role of myosin, actin, tropomyosin, troponin and actinin; Mechanism of muscle contraction and relaxation, the sliding filament theory, Chemical changes during muscle contraction, Neuromuscular junction	<b>05 hrs</b>

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

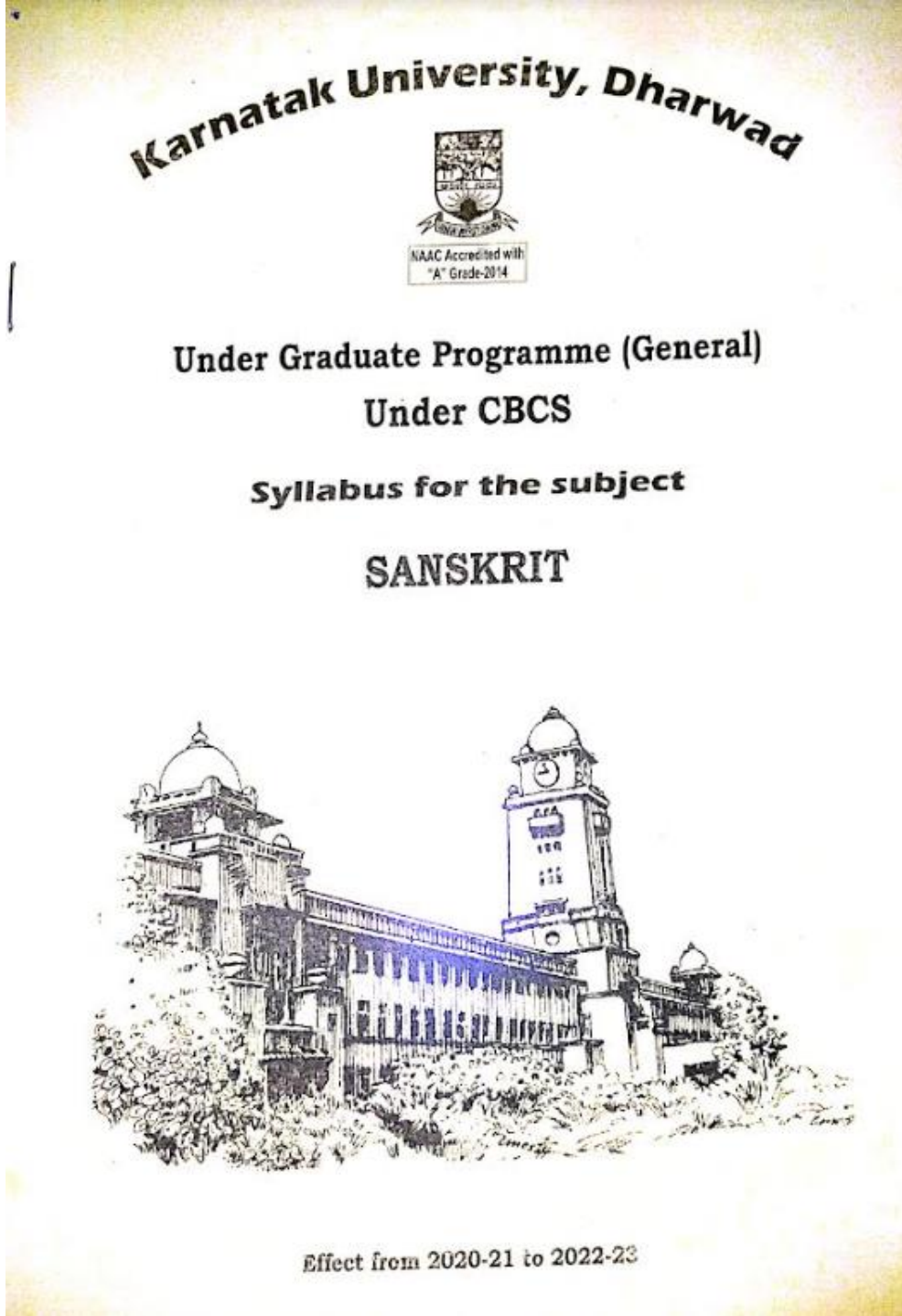
Karnatak University, Dharwad  
Four Years Under Graduate Program in Computer Applications for BCA (Hons.)  
Effective from 2021-22

**SEMESTER -III**

Course	Paper Code	Paper Title Theory/Practical	Credits	No. of Hrs/ Week Theory/ Practical	Total Hours	Duration of Exam in Hrs Theory/ Practical	Internal Assessment Marks Theory/ Practical	Marks for Final Exam Theory/ Practical	Total Marks
AECC	BCA-3.1	English – 3	3	3	45	3	20	80	100
AECC	BCA-3.2	MIL – 3	3	3	45	3	20	80	100
DSC	BCA-3.3	Data Structures using C	4 + 0	4	48	3	20	80	100
DSC	BCA-3.4	OOP with C++	4 + 0	4	48	3	20	80	100
DSC	BCA-3.5	Introduction to Operating System	3 + 1	4	48	3	20	80	100
DSC	BCA-3.6	Data Communications	3 + 1	4	48	3	20	80	100
DSC	BCA-3.7	Data Structures LAB	2	4	48	3	10	40	50
DSC	BCA-3.8	CPP LAB	2	4	48	3	10	40	50
		<b>Total</b>	<b>26</b>	<b>30</b>			<b>140</b>	<b>560</b>	<b>700</b>

**SEMESTER -IV**

Course	Paper Code	Paper Title Theory/Practical	Credits	No. of Hrs/ Week Theory/ Practical	Total Hours	Duration of Exam in Hrs Theory/ Practical	Internal Assessment Marks Theory/ Practical	Marks for Final Exam Theory/ Practical	Total Marks
AECC	BCA-4.1	English - 4	3	3	45	3	20	80	100
AECC	BCA-4.2	MIL – 4	3	3	45	3	20	80	100
DSC	BCA-4.3	Data Base Management System	4 + 0	4	48	3	20	80	100
DSC	BCA-4.4	Programming in JAVA	4 + 0	4	48	3	20	80	100
DSC	BCA-4.5	Software Engineering	3 + 1	4	48	3	20	80	100
DSC	BCA-4.6	System Programming	3 + 1	4	48	3	20	80	100
DSC	BCA-4.7	DBMS LAB	2	4	48	3	10	40	50
DSC	BCA-4.8	JAVA LAB	2	4	48	3	10	40	50
		<b>Total</b>	<b>26</b>	<b>30</b>			<b>140</b>	<b>560</b>	<b>700</b>



**KARNATAK UNIVERSITY, DHARWAD**  
**Syllabus for BA/ B.Music/BFA/BSW/BVA/BSc Hotel Management/ MTTM**  
**Fourth Semester SANSKRIT MIL-D under AECC**  
80 marks paper for 3 hrs duration and 20 marks for Internal Assessment  
Teaching: 3 hrs Theory per week  
45 hrs Syllabus for 3 Credits  
**Title: Khandakavyam-II**

**The course and skill outcome:**

1. In this course students will learn about the famous Sanskrit poet "Kalidasa's Meghadoota (Uttaramegha)". Students also learn creative writing skills in "Meghapratisandeha" written by Mandikal Ramashastri, the modern writer. - 40 Marks
- I. उत्तरमेघ (Verses from 63 to 120) - 30 Marks
- II. मेघप्रतिसन्देशः I:
- III. Grammar (Svara Sandhis and Samasas; Tatpurusha & Dvandva) - 10 Marks

**Suggested Reading:**

1. मेघदूतम् of Kalidasa,- Prasaraanga, Karnatak University, Dharwad.  
मेघदूतम् of Kalidasa- Ed. Dr. C.S. Naikar, Medha Publishers, Dharwad
2. मेघप्रतिसन्देशः I: of Prof. Mandikal Ramashastri, Ed. Prof. Shailaja Bhat, Ankola.
3. संस्कृतव्याकरणसुरभिः- Dr. V.B. Joshi Mahati Prakashana, Dharwad-08
4. उत्तरमेघदूतम् - Dr.C.S. Naikar, Medha Publishers, Dharwad-07

**Question Paper Pattern:**

1. Objective type questions from उत्तरमेघ & मेघप्रतिसन्देशः I: (Any 10 out of 12) - 10x1=10
2. a. Translation and Explanation of verses from उत्तरमेघ (Any 2 out of 4) - 2x5=10  
b. Translation & Explanation of verses from मेघप्रतिसन्देशः I: (Any 2 out of 4) - 2x5=10
3. Explain with reference to context  
a. from उत्तरमेघ (Any 2 out of 4) - 2x5=10  
b. from मेघप्रतिसन्देशः I: (Any 2 out of 4) - 2x5=10  
(Any 2 out of 4)
4. Short notes  
a) From उत्तरमेघ (with internal choice) - 10  
b) From मेघप्रतिसन्देशः I: (with internal choice)
5. Essay type question  
a) On उत्तरमेघ (with internal choice) - 10  
b) On मेघप्रतिसन्देशः I: (with internal choice)
6. Grammar - 10

**KARNATAK UNIVERSITY, DHARWAD**  
**Syllabus for BA/ B.Music/BFA/BSW/BVA/BSc Hotel Management/ MTTM**  
**Third Semester SANSKRIT MIL-C under AECC**  
80 marks paper for 3 hrs duration and 20 marks for Internal Assessment  
Teaching: 3 hrs Theory per week  
45 hrs Syllabus for 3 Credits  
**Title: Khandakavyam-I**

**The course and skill outcome:**

- I. In this course students will learn about the famous Sanskrit poet 'Kalidasa's Meghadoota (Poorvamegha). Students also learn selected Khandakavyas and their authors briefly.
  - I. पूर्वमेघः (Verses from 1 to 62) - 50 Marks
  - II. Brief History of Khandakavya - 20 MarksThe following Khandakavyas are to be studied:
  1. कालिदासः-मेघदूतम्, ऋतुसंहारम्
  2. जयदेवः-गीतगोविन्दम्
  3. भर्तृहरिः-तकत्रयम्
  4. अमरकविः-अमरुतकम्
  5. जगन्नाथ पण्डित-भामिनि विलासः
  6. नीलकण्ठदीक्षितः-कलिविडम्बनम्
- III. Grammar (कदन्त and तद्धितः) - 10 Marks

**Suggested Reading:**

1. मेघदूतम् of Kalidasa, I. Prasaranga, Karnatak University, Dharwad.
2. मेघदूतम् of Kalidasa- Ed. Dr. C.S. Naikar, Medha Publishers, Dharwad
3. संस्कृतव्याकरणसुरभिः- Dr. V.B. Joshi Mahati Prakashana, Dharwad-08
4. कदन्त तद्धितः - Dr.C.S. Naikar, Medha Publishers, Dharwad-07

**Question Paper Pattern:**

1. Objective type questions from पूर्वमेघ & History of खण्डकव्य (Any 10 out of 12) - 10x1=10
2. Translation and Explanation of verses from पूर्वमेघ (Any 3 out of 5) - 3x7=21
3. Explain the Key-sentences (Any 3 out of 5) - 3x4=12
4. Short notes Questions from पूर्वमेघ (Any 2 out of 4) - 2x6=12
5. a. Questions demanding descriptive answers on History of Khandakavya (Any 1 out of 2) - 8  
b. Shortnotes on History of Khandakavya (Any 1 out of 2) - 7
6. Grammar (Kridants and Taddhitas) - 10

**Karnatak University, Dharwad**



**B.A. Programme (General)  
Under CBCS UG**

**Syllabus for the subject**

**MARATHI**



**Effect from 2020-2021 to 2022-23**

**KARNATAK UNIVERSITY, DHARWAD**

**Syllabus for B.Sc./B.C.A**

**III Sem MIL Marathi under AECC**

**Title: Short Essays**

**80 marks paper for 3 hours duration and 20 marks for Internal Assessment.**

**Teaching Hours: 2 theory + 1 Tutorial (per Week) (3 Credit)**

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**Course and Skill Outcome**

1. To introduce ideological writing from Marathi.
2. Its contribution in reformation of society
3. To study and analyze the progressive thoughts based on the text.

**I Maruti Chitampalli's-Ranavataa .**

**Question Paper Pattern**

1. Short answer type questions on prescribed text - 10x3=30  
(10 out of 12)
2. Six descriptive type questions on prescribed text. - 6 x5=30  
(6 out of 8)
3. Four short note type questions on prescribed text. - 4 x5=20  
(4 out of 6)



**KARNATAK UNIVERSITY, DHARWAD**

Syllabus for B.Sc./B.C.A

IV Sem MIL Marathi under AECC

**Title: Poetry**

**80 marks paper for 3 hours duration and 20 marks for Internal Assessment.**

**Teaching Hours: 2 theory + 1 Tutorial (per Week) (3 Credit)**

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**Course and Skill Outcome**

1. To analyze the approaches in rural and feministic writings from Marathi.

**I Bahinabai Choudhari's-Bahinabaichi Ganee – Suchitra Prakashan, Mumbai**

**Question Paper Pattern**

1. Short answer type questions on prescribed text - 10x3=30  
(10 out of 12)
2. Six descriptive type questions on prescribed text. - 6 x5=30  
(6 out of 8)
3. Four short note type questions on prescribed text. - 4x5=20  
(4 out of 6)

**Karnatak University, Dharwad**

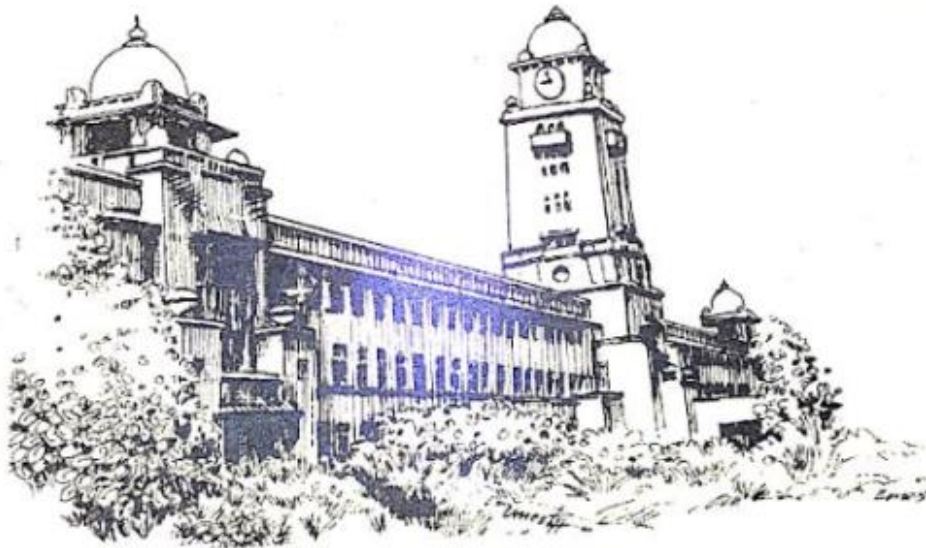


NAAC Accredited with  
"A" Grade-2014

**Under Graduate Programme (General)  
Under CBCS**

**Syllabus for the subject**

**FRENCH**



**Effect from 2020-2021 to 2022-23**

**KARNATAK UNIVERSITY, DHARWAD**

Syllabus for B.A. /B.Sc. /B.P.A/B.Sc. (Fc. Sc) /B.S.W/ B.Com/ B.B.M / B.C.S /  
B.C.A / B.T.H., B. Music/BFA/BVA Sem IV MEL-4 French under AECC

80 marks paper for 3 hours duration and 20 marks for Internal Assessment

Teaching: 3 Hours per week. Syllabus for 3 Credits

Title of the course: Français Fondamental Niveau-4/French Language Basics-level 4

**Course and Skill Outcome:**

1. To equip the learners to take on with the "vie quotidienne" type conversations and discussions in French language with spontaneity, fluency and rigour.

I. Verbal Tense: Subjunctive, Past Perfect, Gerund, Conditional (Present and Past);

II. Passive forms (in the verbal tenses studied);

III. Reported Speech;

IV. Indefinite pronouns (*personne, rien, aucun/le, chaque*);

V. Vocabulary: Structures of "jeux de rôles" in various contexts-task based ; *politexse* ;

VI. Structures for indicating a necessity (*Il faut que... / Il est indispensable que..., etc.*);

VII. Structures of comparison (*supériorité, infériorité and égalité, l'usage de 'autant'*).

**Question Paper Pattern**

	Marks
1.50% of the questions are multiple choice of one mark each.	40x1=40
2.10 out of 12 questions for 2 mark each.	10x2=20
2.2 out of 3 questions for 5 mark each.	02x5=10
4. One out of 2 questions for 10 marks.	01x10=10

**Internal Assessment 20** [08 marks for Dictation, 06 marks for reading & 06 marks for conversation]

**KARNATAK UNIVERSITY, DHARWAD**

**Syllabus for B.A. /B.Sc. /B.P.A/B.Sc. (Fc. Sc) /B.S.W/ B.Com/ B.B.M / B.C.S / B.C.A / B.T.H., B. Music/BFA/BVA Sem III MEL-3 French under AECC**  
80 marks paper for 3 hours duration and 20 marks for Internal Assessment  
Teaching: 3 Hours per week. Syllabus for 3 Credits

**Title of the course: Français Fondamental Niveau-3/French Language Basics-level 3**

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**Course and Skill Outcome:**

I. To facilitate honing of the skills acquired by the learners and to further enrich their communicability with fluency and confident expression in French.

**I.** Verbal Tenses: Present, Past compound, Imperfect and (honing of the skills acquired); **II.** Agreement of past participle (*être* and *avoir*); Agreement of past participle (gender and number), Agreement of past participle with direct object;

**III.** Reported Speech (present tense);

**IV.** Pronouns: Relative pronouns (*qui, que* and *à qui*);

**V.** Vocabulary: Structures for defining something (*c'est* + infinitive, etc.);

**VI.** Temporal expressions

**Question Paper Pattern for 80 marks**

1.50% of the questions are multiple choice of one mark each.

2.10 out of 12 questions for 2 mark each.

2.2 out of 3 questions for 5 mark each.

4. One out of 2 questions for 10 marks.

**Marks**

40x1=40

10x2=20

02x5=10

01x10=10

**Internal Assessment 20** [08 marks for Dictation, 06 marks for reading & 06 marks for conversation]



## ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ

ಜಿ.ಎ. ಪದವಿ ತರಗತಿಗಳ CBCS ಪಠ್ಯದ ವಿವರ

೨೦೨೦-೨೧, ೨೨, ೨೩ ಹಾಗೂ ಅನಂತರದ ಅವಧಿಗಾಗಿ



1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ  
ಬಿ.ಎಸ್ಸಿ ಪದವಿ ಪಠ್ಯಕ್ರಮಗಳ CBCS ಪಠ್ಯದ ವಿವರ  
೨೦೨೦-೨೧,೨೨,೨೩ ಹಾಗೂ ಅನಂತರದ ಅವಧಿಗಾಗಿ.

ಅ.ಸಂ	ಸೆಮಿಸ್ಟರ್	ಪಠ್ಯದ ಹೆಸರು	ಕ್ರೆಡಿಟ್ಸ್	ವಿ.ವಿ ಅಂಕಗಳು	ಆಂತರಿಕ ಅಂಕಗಳು	ಒಟ್ಟು
೦೧	೧ನೇ ಸೆಮಿಸ್ಟರ್	AECC ಅ. ವಿಜ್ಞಾನ ಸಂವಹನ ಬ. ಆಧುನಿಕ ಕನ್ನಡ ಕಾವ್ಯ	೩+೦+೦=೦೩	೪೦ ೪೦	೨೦	೧೦೦
೦೨	೨ನೇ ಸೆಮಿಸ್ಟರ್	AECC. ಅ. ಪರಿಸರ ಸಾಹಿತ್ಯ ಬ. ಕಾದಂಬರಿ	೩+೦+೦=೦೩	೪೦ ೪೦	೨೦	೧೦೦
೦೩	೩ನೇ ಸೆಮಿಸ್ಟರ್	AECC ಅ. ಕೃಷಿ ಸಾಹಿತ್ಯ ಬ. ನಾಟಕ	೩+೦+೦=೦೩	೪೦ ೪೦	೨೦	೧೦೦
೦೪	೪ನೇ ಸೆಮಿಸ್ಟರ್	AECC. ಅ. ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಬ. ಆತ್ಮಕತೆ	೩+೦+೦=೦೩	೪೦ ೪೦	೨೦	೧೦೦

**Karnatak University, Dharwad**



MAAC Accredited with  
"A" Grade-2014

**Under Graduate Programme (General)  
Under CBCS UG**

**Syllabus for the subject**

**ENGLISH**



**Effect from 2020-2021 to 2022-23**







**Karnatak  University**  
**Dharwad**  
**Department of Physics**

**Syllabus based on Choice Based Credit System (CBCS)**  
**(2018 Scheme)**  
**for**  
**M. Sc.Course in PHYSICS**

*With effect from the year 2018 for the I & II Semesters and from  
the year 2019 for III & IV Semesters Onwards*

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1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

members.

M.Sc. Course in Physics  
Choice Based Credit System (CBCS)  
(2018 Scheme)  
**Teaching and Evaluation Scheme**

| Sem. No.                  | Course code | Title of the Paper                                                                  | Credits | Teaching Hrs/week | Duration of Exam. in hours for Theory/ Practical | Maximum Marks      |    |       |
|---------------------------|-------------|-------------------------------------------------------------------------------------|---------|-------------------|--------------------------------------------------|--------------------|----|-------|
|                           |             |                                                                                     |         |                   |                                                  | Semester -End Exam | IA | Total |
| <b>Compulsory Courses</b> |             |                                                                                     |         |                   |                                                  |                    |    |       |
| <b>I</b>                  | PH CT1.1    | Mathematical Methods in Physical Sciences                                           | 4       | 4                 | 3                                                | 75                 | 25 | 100   |
|                           | PH CT1.2    | Classical Mechanics                                                                 | 4       | 4                 | 3                                                | 75                 | 25 | 100   |
|                           | PH CT1.3    | Electronics (General)                                                               | 4       | 4                 | 3                                                | 75                 | 25 | 100   |
|                           | PH CT1.4    | Condensed Matter Physics (General)                                                  | 4       | 4                 | 3                                                | 75                 | 25 | 100   |
|                           | PH CP1.5    | <b>Practical- I</b><br>Electronics and Condensed Matter Physics (General)           | 4       | 4                 | 4                                                | 75                 | 25 | 100   |
|                           | PH CP1.6    | <b>Practical- II</b><br>Atomic & Molecular and Nuclear & Particle Physics (General) | 4       | 4                 | 4                                                | 75                 | 25 | 100   |

|                           |          |                                                |   |   |   |    |    |     |
|---------------------------|----------|------------------------------------------------|---|---|---|----|----|-----|
| <b>Compulsory Courses</b> |          |                                                |   |   |   |    |    |     |
| <b>II</b>                 | PH CT2.1 | Quantum Mechanics-I                            | 4 | 4 | 3 | 75 | 25 | 100 |
|                           | PH CT2.2 | Atomic & Molecular Physics (General)           | 4 | 4 | 3 | 75 | 25 | 100 |
|                           | PH CT2.3 | Nuclear & Particle Physics (General)           | 4 | 4 | 3 | 75 | 25 | 100 |
|                           | PH ET2.4 | <b>Open Elective Course:</b><br>Modern Physics | 4 | 4 | 3 | 75 | 25 | 100 |

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

|            |                                |                                                                                                                                              |   |   |   |    |    |     |
|------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|----|-----|
|            | PH CP2.5                       | <b>Practical-III</b><br>Electronics and<br>Condensed Matter<br>Physics (General)                                                             | 4 | 4 | 4 | 75 | 25 | 100 |
|            | PH CP2.6                       | <b>Practical-IV</b><br>Atomic & Molecular<br>and Nuclear & Particle<br>Physics (General)                                                     | 4 | 4 | 4 | 75 | 25 | 100 |
|            | <b>Compulsory Course:</b>      |                                                                                                                                              |   |   |   |    |    |     |
|            | PH CT3.1                       | Quantum Mechanics-II                                                                                                                         | 4 | 4 | 3 | 75 | 25 | 100 |
|            | <b>Specialization Courses:</b> |                                                                                                                                              |   |   |   |    |    |     |
| <b>III</b> | PH ST3.2                       | Electronics-I/<br>Condensed Matter<br>Physics-I/ Atomic &<br>Molecular Physics-I/<br>Nuclear & Particle<br>Physics-I                         | 4 | 4 | 3 | 75 | 25 | 100 |
|            | PH ST3.3                       | Electronics-II/<br>Condensed Matter<br>Physics-II/ Atomic &<br>Molecular Physics-II/<br>Nuclear & Particle<br>Physics-II                     | 4 | 4 | 3 | 75 | 25 | 100 |
|            | PH ET3.4                       | <b>Open Elective<br/>Course:</b><br>a. Instrumental<br>Methods<br>Or<br>b. Physics of<br>Nanomaterials                                       | 4 | 4 | 3 | 75 | 25 | 100 |
|            | PH SP3.5                       | <b>Practical</b><br>Electronics-I/<br>Condensed Matter<br>Physics-I/ Atomic &<br>Molecular Physics-I/<br>Nuclear & Particle<br>Physics-I     | 4 | 4 | 4 | 75 | 25 | 100 |
|            | PH SP3.6                       | <b>Practical</b><br>Electronics-II/<br>Condensed Matter<br>Physics-II/ Atomic &<br>Molecular Physics-II/<br>Nuclear & Particle<br>Physics-II | 4 | 4 | 4 | 75 | 25 | 100 |
|            |                                | <b>Compulsory Courses:</b>                                                                                                                   |   |   |   |    |    |     |
| <b>IV</b>  | PH CT4.1                       | Classical<br>Electrodynamics                                                                                                                 | 4 | 4 | 3 | 75 | 25 | 100 |

|  |                                |                                                                                                                                                  |   |   |   |                                                  |    |     |
|--|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|--------------------------------------------------|----|-----|
|  | PH CT4.2                       | Statistical and<br>Thermal Physics                                                                                                               | 4 | 4 | 3 | 75                                               | 25 | 100 |
|  | <b>Specialization Courses:</b> |                                                                                                                                                  |   |   |   |                                                  |    |     |
|  | PH ST4.3                       | Electronics-III/<br>Condensed Matter<br>Physics-III/ Atomic &<br>Molecular Physics-III/<br>Nuclear & Particle<br>Physics-III                     | 4 | 4 | 3 | 75                                               | 25 | 100 |
|  | PH ST4.4                       | Electronics-IV/<br>Condensed Matter<br>Physics-IV/ Atomic &<br>Molecular Physics-IV/<br>Nuclear & Particle<br>Physics-IV                         | 4 | 4 | 3 | 75                                               | 25 | 100 |
|  | PH SP4.5                       | <b>Practical</b><br>Electronics-III/<br>Condensed Matter<br>Physics-III/ Atomic &<br>Molecular Physics-III/<br>Nuclear & Particle<br>Physics-III | 4 | 4 | 4 | 75                                               | 25 | 100 |
|  | PHSPJ4.6                       | <b>Project:</b><br>Electronics/<br>Condensed Matter<br>Physics/ Atomic &<br>Molecular Physics/<br>Nuclear & Particle<br>Physics                  | 6 | 6 | 4 | 75<br>(Disserta-<br>tion) +<br>50(Viva-<br>voce) | 25 | 150 |

# KARNATAK UNIVERSITY



**M. Sc. Chemistry**

**Choice Based Credit System**

**(CBCS)**

***Revised Syllabus***

**(w.e.f. 2019-20)**

# 1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**KARNATAK UNIVERSITY, DHARWAD**  
**M.Sc. DEGREE PROGRAMME IN CHEMISTRY**  
**(With effect from 2019-20)**

**(CBCS)**

Course Structure and Scheme of Examination:

**FIRST SEMESTER**

| Description of Papers                           | Credits | No. of Hrs/ week Theory/ Practical | Duration of exam. in Hrs Theory/ Practical | Internal Assessment Marks Theory/ Practical | Marks at the exams. | Total Marks |
|-------------------------------------------------|---------|------------------------------------|--------------------------------------------|---------------------------------------------|---------------------|-------------|
| <b>A. Core Subjects</b>                         |         |                                    |                                            |                                             |                     |             |
| CHGT-1.1: Inorganic Chemistry-I                 | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| CHGT-1.2: Organic Chemistry-I                   | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| CHGT-1.3: Physical Chemistry- I                 | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| CHGT-1.4: Analytical Chemistry                  | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| <b>B. Practical</b>                             |         |                                    |                                            |                                             |                     |             |
| CHG(Pr)-1.5: Lab Course in Inorganic Chemistry  | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| CHG(Pr)-1.6: Lab Course in Organic Chemistry    | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| CHG(Pr)-1.7: Lab Course in Physical Chemistry   | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| CHG(Pr)-1.8: Lab Course in Analytical Chemistry | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| Total                                           | 24      | 32                                 | 28                                         | 140                                         | 460                 | 600         |

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**SECOND SEMESTER**

| Description of Papers                           | Credits | No. of Hrs/ week Theory/ Practical | Duration of exam. in Hrs Theory/ Practical | Internal Assessment Marks Theory/ Practical | Marks at the exams. | Total Marks |
|-------------------------------------------------|---------|------------------------------------|--------------------------------------------|---------------------------------------------|---------------------|-------------|
| <b>A. Core Subjects</b>                         |         |                                    |                                            |                                             |                     |             |
| CHGT-2.1: Inorganic Chemistry-II                | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| CHGT-2.2: Organic Chemistry-II                  | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| CHGT-2.3: Physical Chemistry-II                 | 4       | 4                                  | 3                                          | 25                                          | 75                  | 100         |
| <b>B. Elective</b>                              |         |                                    |                                            |                                             |                     |             |
| CHET-2.1: Applied Inorganic Chemistry           |         |                                    |                                            |                                             |                     |             |
| <b>C. Practical</b>                             |         |                                    |                                            |                                             |                     |             |
| CHG(Pr) -2.4: Lab Course in Inorganic Chemistry | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| CHG(Pr) -2.5: Lab Course in Organic Chemistry   | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| CHG(Pr) -2.6: Lab Course in Physical Chemistry  | 2       | 4                                  | 4                                          | 10                                          | 40                  | 50          |
| Total                                           | 22      | 28                                 | 24                                         | 130                                         | 420                 | 550         |

**KARNATAK UNIVERSITY, DHARWAD**



NAAC Accredited with  
"A" Grade-2014

**P.G. Department of Studies in Mathematics**

**Regulations and Syllabus**

**for**

**MATHEMATICS**

**(I to IV Semesters)**

**Under Choice Based Credit System**



**With effect from 2013-14**



## THIRD SEMESTER

| Description of Papers                                                               | Credits | No. of Hrs/<br>week<br>Theory/<br>Practical | Duration<br>of exam.<br>in Hrs<br>Theory/<br>Practical | Internal<br>Assessm<br>ent<br>Marks<br>Theory/<br>Practical | Marks<br>at the<br>exams. | Total<br>Marks |
|-------------------------------------------------------------------------------------|---------|---------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|---------------------------|----------------|
| <b>A. Core Subjects</b>                                                             |         |                                             |                                                        |                                                             |                           |                |
| <b>Inorganic Chemistry</b>                                                          |         |                                             |                                                        |                                                             |                           |                |
| CHGT-3.1: Inorganic Chemistry                                                       | 4       | 4                                           | 3                                                      | 25                                                          | 75                        | 100            |
| CHGT-3.2: Organic Chemistry                                                         | 4       | 4                                           | 3                                                      | 25                                                          | 75                        | 100            |
| CHGT-3.3: Physical Chemistry                                                        | 4       | 4                                           | 3                                                      | 25                                                          | 75                        | 100            |
| <b>B. Elective</b>                                                                  |         |                                             |                                                        |                                                             |                           |                |
| CHEOT-3.1: Applied Organic Chemistry<br>OR<br>CHEPT-3.1: Applied Physical Chemistry |         |                                             |                                                        |                                                             |                           |                |
| <b>C. Practical</b>                                                                 |         |                                             |                                                        |                                                             |                           |                |
| CHG(Pr)-3.4: Lab Course in Inorganic Chemistry                                      | 2       | 4                                           | 4                                                      | 10                                                          | 40                        | 50             |
| CHG(Pr)-3.5: Lab Course in Organic Chemistry                                        | 2       | 4                                           | 4                                                      | 10                                                          | 40                        | 50             |
| CHG(Pr)-3.6: Lab Course in Physical Chemistry                                       | 2       | 4                                           | 4                                                      | 10                                                          | 40                        | 50             |
| Total                                                                               | 22      | 28                                          | 24                                                     | 130                                                         | 420                       | 550            |

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

| Sl. No.                                       | Paper & Title                                                                                                                                                                                          | Credits   | No. of Hrs/ week Theory/ Practical | Duration of exam in Hrs Theory/ Practical | Internal Assessment Marks Theory/ Practical | Marks at the Exams | Total Marks |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------|-------------------------------------------|---------------------------------------------|--------------------|-------------|
| <b>III Semester (w.e.f. 2012-13)</b>          |                                                                                                                                                                                                        |           |                                    |                                           |                                             |                    |             |
| 3.1                                           | Measure Theory                                                                                                                                                                                         | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 3.2                                           | Complex Analysis-II                                                                                                                                                                                    | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 3.3                                           | Topology-II                                                                                                                                                                                            | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 3.4                                           | Differential Geometry-I                                                                                                                                                                                | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 3.5                                           | Numerical Methods                                                                                                                                                                                      | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 3.6                                           | Programming Lab-II                                                                                                                                                                                     | 2         | 4                                  | 3                                         | 15                                          | 35                 | 50          |
| 3.7                                           | Discrete Mathematical Structures                                                                                                                                                                       | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| OEC3                                          |                                                                                                                                                                                                        |           |                                    |                                           |                                             |                    |             |
| <b>Total of III Semester</b>                  |                                                                                                                                                                                                        | <b>22</b> |                                    |                                           |                                             |                    | <b>550</b>  |
| <b>IV Semester (w.e.f. 2012-13)</b>           |                                                                                                                                                                                                        |           |                                    |                                           |                                             |                    |             |
| 4.1                                           | Functional Analysis                                                                                                                                                                                    | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 4.2                                           | 4.2CT(a) Fuzzy Topology OR<br>4.2CT(b) Dimension Theory OR<br>4.2CT(c) Relativity OR<br>4.2CT(d) Ring Theory OR<br>4.2CT(e) Galois Theory OR<br>4.2CT(f) Number Theory                                 | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 4.3                                           | 4.3CT(a) Graph Theory OR<br>4.3CT(b) Differentiable Manifolds OR<br>4.3CT(c) Nevanlinna Theory OR<br>4.3CT(d) Geometric Function Theory OR<br>4.3CT(e) Group Theory OR<br>4.3CT(f) Commutative Algebra | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 4.4                                           | Differential Equations-III                                                                                                                                                                             | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 4.5                                           | Differential Geometry-II                                                                                                                                                                               | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 4.6                                           | Integral Transforms and Integral Equations                                                                                                                                                             | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 4.7                                           | Programming Lab - III                                                                                                                                                                                  | 2         | 4                                  | 3                                         | 15                                          | 35                 | 50          |
| 4.8                                           | <b>Project Work</b>                                                                                                                                                                                    | <b>4</b>  | <b>4</b>                           |                                           | <b>25 (Viva)</b>                            | <b>75</b>          | <b>100</b>  |
| CPW                                           |                                                                                                                                                                                                        |           |                                    |                                           |                                             |                    |             |
| <b>Total of IV Semester</b>                   |                                                                                                                                                                                                        | <b>24</b> |                                    |                                           |                                             |                    | <b>600</b>  |
| <b>Grand total of all semesters (I to IV)</b> |                                                                                                                                                                                                        | <b>90</b> |                                    |                                           |                                             |                    | <b>2250</b> |

**Note:** CT - Compulsory Theory  
 CP - Compulsory Practical  
 CPW - Compulsory Project Work  
 OEC - Open Elective Course (for other Department Students)

1.2.1.1 - Number of Programmes in which CBCS/ Elective course system implemented

**KARNATAK UNIVERSITY, DHARWAD**  
**Department of Mathematics**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**(w.e.f. 2011-12)**  
**Course Structure and Scheme of Examination**

| Sl. No.                             | Paper & Title                  | Credits   | No. of Hrs/ week Theory/ Practical | Duration of exam in Hrs Theory/ Practical | Internal Assessment Marks Theory/ Practical | Marks at the Exams | Total Marks |
|-------------------------------------|--------------------------------|-----------|------------------------------------|-------------------------------------------|---------------------------------------------|--------------------|-------------|
| <b>I Semester (w.e.f. 2011-12)</b>  |                                |           |                                    |                                           |                                             |                    |             |
| 1.1 CT                              | Algebra-I                      | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 1.2 CT                              | Real Analysis                  | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 1.3 CT                              | Topology-I                     | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 1.4 CT                              | Differential Equations-I       | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 1.5 CT                              | Discrete Mathematics           | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 1.6 CT                              | Computer Programming           | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| <b>1.7 CT</b>                       | <b>Operations Research</b>     | <b>4</b>  | <b>4</b>                           | <b>3</b>                                  | <b>25</b>                                   | <b>75</b>          | <b>100</b>  |
| <b>Total of I Semester</b>          |                                | <b>22</b> |                                    |                                           |                                             |                    | <b>550</b>  |
| <b>II Semester (w.e.f. 2011-12)</b> |                                |           |                                    |                                           |                                             |                    |             |
| 2.1 CT                              | Algebra-II                     | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 2.2 CT                              | Complex Analysis-I             | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 2.3 CT                              | Linear Algebra                 | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| 2.4 CT                              | Functions of Several Variables | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 2.5 CT                              | Differential Equations-II      | 2         | 2                                  | 2                                         | 15                                          | 35                 | 50          |
| 2.6 CP                              | Programming Lab-I              | 2         | 4                                  | 3                                         | 15                                          | 35                 | 50          |
| 2.7 OEC2                            | Fuzzy Sets & Fuzzy Logic       | 4         | 4                                  | 3                                         | 25                                          | 75                 | 100         |
| <b>Total of II Semester</b>         |                                | <b>22</b> |                                    |                                           |                                             |                    | <b>550</b>  |

  
**Principal,**  
**Karnatak Science College**  
**Dharwad.**