Principal's Office, Raja Bhoj Govt. College, Katangi, Balaghat (M.P.)
(ACCREDITED WITH "C" GRADE BY NAAC)
Phone 07630-250087
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AQAR for Academic Session: 2023-24

GOVERNANCE, LEADERSHIP AND MANAGEMENT

6.5 - Internal Quality Assurance System

6.5.2 - The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms and recorded the incremental improvement in various activities

Upload Any Additional Information

Document Details:

Program Outcomes, Program Specific Outcomes and Course Outcomes

UG (1ST & 2ND)			PG (ALL SEMESTER)	
Sr. No.	Course Outcome Subjectwise For UG		Sr. No.	Course Outcome Subjectwise For PG
01	Botany		01	Botany
02	Chemistry		02	Chemistry
03	Zoology		03	Zoology
04	Physics		04	Economics
05	Computer Science		05	Maths
06	Political Science			
07	English			
08	Geography			
09	Sociology			
10	Hindi			
11	Maths			
12	Economics			

Principal
Raja Bhoj Govt. College
Katangi-Balaghat- M.P

Part A Introduction

Program: Certificate	Class: B.Sc. 1st year	Year : 2021	Session: 2021-22

Subject: Botany

1	Course Code	S1-BOTA1T
2	Course Title	Applied Botany (Paper I)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course
4	Pre-requisite (if any)	To study this course, a student must have had the subject Biology/ Life Sciences/ Agriculture in class/12th
5	Course Learning outcomes (CLO)	By the end of this course the student should have: • Understood the significance and role of botany. • Learnt the basic aspects of applied botany. • Gained knowledge about employment opportunities in field of botany • Gained knowledge about start-up opportunities in the field of botany • Learnt about opportunities of social services • Gain knowledge about best health practices
6	Credit Value	04 Credits
7	Total Marks	Max. Marks: 25+75 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures- 60 Hours Tutorials- 00 Practical -00 (04 hours per week): L-T-P:

Unit	Topics	No. of Lectures
I	1.1Introduction, objectives and importance of Applied botany 1.2 History and evolution of botany 1.3 Relation of plants to man and relation with other services 1.4 Various disciplines of botany and theirapplications to human welfare	12
II	1.1 Definition and types of pollution and pollutants **1.2 Phytoremediation:** Air, water, soil, noise and thermal pollutants (Any 5 plants with botanical name, family) and their role in pollution control 1.3Bioremediation: definition and types	12
III	1.1Ancient agricultural practices. **1.2Modern agriculture practices**: Polyhouse, Drip irrigation, hydroponics, computer-based agriculture.	12

Teach
05/5/21

Part A Introduction				
Program: Certificate		Class: BSc-I	Year:2021	Session:2021-22
Subject: Botany				
1	Course Code	S1-BOTA2T		
2	Course Title	Basic Botany (paper II)		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course		
4	Pre-requisite (if any)	To study this course, a student must have had the subject botany in class/12th/ certificate/diploma.		
5	Course Learning outcomes (CLO)	• This course will help the student to understand the diversity of plants and evolutionary process in plant kingdoms. • It gives an accounts of plant adaptations from aquatic condition to colonize terrestrial habitat. • The changes in morphological, anatomical and reproductive structures that propel plant evolution can be investigated. • The economic importance and significance of plants in nature will be understood. • They will be acquainted with locally prevalent microbial diseases of plants and humans		
6	Credit Value	4 Credits		
7	Total Marks	Max. Marks: 25+75	Min. Passing Marks:33	

Part B- Content of the Course

Total No. of Lectures- 60Tutorials- 0 Practical =0 (theory 4 hours per week):
L-T-P:

Unit	Topics	No. of Lectures
I	1.1 History of Botany and Indian Contributions. 1.2Morphological Characteristics of lower and higher plants(Angiosperms). 1.3Types of leaves, Inflorescence, Flowers and Fruits. 1.4 Structure of Plant cell and cell organelles, Prokaryotic and Eukaryotic Cells, types of Cell division. 1.5 Microscope structure and function of light microscope (magnification and resolving power). 1.6 Various types of Microscopes: Bright field, Phase Contrast, SEM and TEM.	12
II	1. Algae 1.1General characteristics 1.2Range of thallus organization, reproduction. 1.3Types of life-cycles in algae 1.4 Role of algae in nature and its economic importance.	12

23/5/21

Part A Introduction			
Program:Diploma	Class': BSc	Year: Second	Session:2022-23
Subject: Botany			

1	Course Code	S2-BOTA1T	
2	Course Title	Plant Anatomy and Embryology	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Major -1	
4	Pre-requisite (if any)	To study this course, a student must have had subject botany in B.Sc. I year/ certificate course.	
5	Course Learning outcomes (CLO)	• Students will learn the internal structure of plants. It will enhance the basic understanding of organization of plant body by cells and tissues. • Students will understand the dynamic mechanism of plant pollination, fertilization and development. • They will have hands on training on section cutting, preparation of slides, study of pollen and ovules.	
6	Credit Value	4 Credits	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures- 60 Tutorials- 0 Practical =0 (theory 2 hours per week):

L-T-P:

Unit	Topics	No. of Lectures
I	Meristematic and permanent tissues 1.1 Types of meristems, 1.2 Organization of Root and shoot apex 1.3 Simple and complex tissues. 1.4 Special type of tissues. 1.5 Structure of dicot and monocot root, stem and leaf Kranz anatomy. 1.6 Pits and plasmodesmata; 1.7 Wall ingrowths and transfer cells. 1.8 Hydathodes, cavities, lithocysts and laticefers	12
II	Secondary Growth : 1.1 Vascular cambium – structure, function and seasonal	12

Part A Introduction			
Program: Diploma	Class: B.Sc.	Year:Second	Session:2022-23
Subject: Botany			

1	Course Code	S2-BOTA2T	
2	Course Title	Industrial Botany	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Major-2 / Minor / Elective	
4	Pre-requisite (if any)	The course is open to all who have completed I year certificate course in botany and other subjects	
5	Course Learning outcomes (CLO)	• This course will provide knowledge on plants and their parts used in various industries. • Students will get an idea to establish plant based natural product industry. • This course will make the students self-reliant.	
6	Credit Value	4 Credits	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures- 60 Hours Tutorials- 0 Practical =0 (theory 2 hours per week):

L/T/P:

Unit	Topics	No. of Lectures
I	1 Plants in Timber Industry: 1.1 Timber yielding trees of India and their products (Shisham, Sal, Teak, Deodar, Babool). 1.2 Bamboo and Cane Industry. 1.3 Kattha' Industry.	12

B.Sc. I Year Chemistry Syllabus

CBCS Annual Pattern
From Academic Year 2021-2022

Paper I

Part A Introduction			
Program-CERTIFICATE	Class-B.Sc.	Year- First	Session: 2021-2022
Subject - Chemistry			
Course Code	S1-CHEM1T		
Course Title	**Fundamentals of Chemistry(Paper I)**		
Course Type	Core Course		
Pre-requisite (if any)	To study this course our students must have had the subject Chemistry in class +2 or equivalent.		
Course Learning Outcomes (CLO)	By the end of this course students will learn the following aspects of Chemistry: 1. Ancient Indian chemical techniques. 2. Various theories and principles applied to reveal atomic structure. 3. Significance of quantum numbers. 4. Concept of periodic properties of elements. 5. Theories related to chemical bonding. 6. Acid-base concept, ph, buffer. 7. Factors responsible for reactivity of organic molecules. 8. Basics and mechanism of chemical kinetics. 9. Properties of electrolytes.		
Credit Value	4		
Total Marks	Maximum Marks: CCE-25, University Exam (UE)- 75	Minimum Passing Marks: 33	

Part B- Content of the course		
Total No. of Lectures-Tutorials-Practical (In hours per week): L-T-P:60-0-30		
Unit	**Topic**	**No. of lectures**
1	(a)Chemical techniques in ancient India: General Introduction (b) Contribution of ancient Indian scientists in chemistry e.g. metallurgy, dyes, pigments, cosmetics, Ayurveda, Charak Samhita. **Atomic Structure:** (i) Review of Bohr's theory and its limitations. Atomic spectrum of Hydrogen. Dual nature of particles and waves, de Broglie's equation, Heisenberg's	2+4

B.Sc. I Year Chemistry Syllabus

CBCS Annual Pattern
From Academic Year 2021-2022

Paper II

Part A Introduction			
Program- CERTIFICATE	**Class- B.Sc.**	**Year- First**	**Session: 2021-2022**
Subject - Chemistry			
Course Code	S1-CHEM2T		
Course Title	**Analytical Chemistry (Paper II)**		
Course Type	Core Course		
Pre-requisite (if any)	To study this course students must have had the subject Chemistry in class −2 or equivalent.		
Course Learning Outcomes (CLO)	By the end of this course students will learn the following aspects of Chemistry: 1. Basic concepts of Mathematics for Chemists. 2. Fundamentals of analytical chemistry and steps involved in analysis. 3. Basic knowledge of Computer for chemists. 4. Basic Concepts of Chemical equilibrium. 5. Principles of Chromatography and chromatographic techniques. 6. Various techniques of Spectroscopic Analysis.		
Credit Value	4		
Total Marks	Maximum Marks: CCE-25, University Exam (UE)- 75	Minimum Passing Marks: 33	

B.Sc. II Year Chemistry Syllabus

CBCS Annual Pattern

From Academic Year 2022-2023

Chemistry-NEP (2020)

Part-A Introduction			
Program: Diploma		Class: B. Sc. | Year: Second	Session: 2022-2023
Subject: Chemistry			
1	Course Code	S2-CHEMIT	
2	Course Title	Reactions, Reagents and Mechanisms in Organic Chemistry (Paper 1)	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/....)	Core Course	
4	Pre-requisite (if any)	To study this course the students must have had the subject Chemistry in 12th Class or Subject Chemistry in Certificate Course of B. Sc.	
5	Course Learning outcomes (CLO)	By the end of this course students will acquire the knowledge of following aspects of chemistry: • Various organic reactions, reagents and their mechanisms, which will be helpful in understanding organic synthesis. • Application of the reactions in the various industries like pharmaceutical, polymer, pesticides, textile, dyes etc. • Important key reactions used in further study and research work.	
6	Credit Value	4	
7	Total Marks	Max. Marks: 100 30 CCE +70 UE	Min. Passing Marks:33

Part-B Content of the Course		
Total No. of Lectures-Tutorials-Practical (in hours per week): 02 L-T-P: 2-0-0 (Total Hours 60)		
Unit	Topics	No. of Lectures
Unit I	<u>Substitution reactions</u> **Aliphatic Nucleophilic Substitution:** Introduction, the S_N1, S_N2 and S_Ni mechanisms, neighbouring group participation, effect of substrate, nucleophile, leaving group and reaction medium. **Aliphatic Electrophilic Substitution:** Elementary treatment. **Aromatic Nucleophilic Substitution:** the S_NAr, S_N1 and Benzyne mechanisms, effect of substrate, nucleophile, leaving group and	12

B.Sc. II Year Chemistry Syllabus
CBCS Annual Pattern
From Academic Year 2022-2023
Chemistry-NEP (2020)

Part A Introduction			
Program: Diploma	Class: B. Sc.	Year: Second	Session: 2022-2023
Subject: Chemistry			

1	Course Code	S2-CHEM2T
2	Course Title	Transition Elements, Chemi-energetics, Phase Equilibria (Paper 2)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course
4	Pre-requisite (if any)	To study this course the students must have had the subject Chemistry in 12th Class or Subject Chemistry in Certificate Course of B. Sc.
5	Course Learning outcomes (CLO)	By the end of this course students will learn the following aspects of Chemistry: • Introductory idea about Traditional Indian Chemistry • Chemistry of d- & f-block Elements, Basic Concepts of Coordination Chemistry. • Stereochemistry of Transition Metal Complexes. • Laws of Thermodynamics. • Concept of Phase Equilibrium with reference to Solid Solution, Liquid-Liquid Mixtures, Partially Miscible Liquids. • Basic Concepts of Electrochemistry.
6	Credit Value	4 (Theory)
7	Total Marks	Max. Marks: 100 30 CCE +70 UE Min. Passing Marks: 33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week): 2 hours per week (L-T-P: 2-0-0)
Total No. of Lectures: 60

Unit	Topics	No. of Lectures
1	**Knowledge Tradition of Indian Chemistry** Ancient Indian chemists and their works: Nagarjuna, Vagbhata, Govindacharya, Yashodhara, Ramchandra, Somadeva, etc. **Introductory idea about rasas** Main rasa: Maharas, Uparas, Common ras, Ratna, dhatu, poison, alkali, acid, salt, lauhabhasma. **Maharas:** Abram, Vaikrant, Bhasik, Vimala, Shilajatu, Sasak, Chapala,	2

Theory Syllabus

Part A Introduction			
Porgramme : Certificate Course	Class : B.Sc.	Year : I year	Session : 2021-2022
Subject: Zoology			

1	Course Code	S1-ZOOLIT
2	Course Title	Animal Diversity: Non-Chordata (Paper – 1)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course
4	Pre-requisite (if any)	To study this course a student must have had the subject Biology in 12th Class
5	Course Learning outcomes (CLO)	Upon completion of the course students should be able to 1. Learn about the importance of systemic. taxonomy and phylogeny to get a concrete idea of evolution of non-chordate phyla. 2. Understand the various morphological. anatomical structures and functions of animals of different phyla. 3. Get the knowledge about economic, ecological and medical significance of various animals in human welfare. 4. Understand the important parasites and their control measures.
6	Credit Value	4
7	Total Marks	Max. Marks: 25+75 / Min. Passing Marks:33

Dr. U.S. Parmar
Chairman
Central Board of Studies
Subject – Zoology
Date - 29.05.2021

Theory Syllabus

Part A Introduction			
Porgramme : Certificate Course	Class : B.Sc.	Year : I year	Session : 2021-2022
Subject: Zoology			
1	Course Code	S1-ZOOL2T	
2	Course Title	Cell biology, Reproductive biology and Developmental Biology (Paper II)	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/....)	Core Course	
4	Pre-requisite (if any)	To study this course a student must have had the subject Biology in 12th Class.	
5	Course Learning outcomes (CLO)	Upon completion of the course students should be able to 1. Develop deeper understanding of what life is and how it functions at cellular level 2. Understand the nature and basic concepts of Cell biology, Reproductive and Developmental biology 3. Understand structure and functions of cell membrane and cellular organelles 4. Understand the importance of latest reproductive trends, reproductive techniques to be applied for human welfare. 5. Understand the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multi-cellular organisms. 6. Understand about the evolutionary development of various animals.	
6	Credit Value	4	
7	Total Marks	Max. Marks:25 +75	Min. Passing Marks:33

Dr. U.S. Parmar
Chairman
Central Board of Studies
Subject – Zoology
Date - 29.05.2021

Theory Syllabus

Part A- Introduction			
Program: Diploma	Class: B. Sc.	Year: II year	Session: 2022-23
Subject: Zoology			

1	Course Code	S2-ZOOL1T
2	Course Title	Diversity of Chordates and Comparative Anatomy (paper-1)
3	Course Type	Core Course
4	Pre-requisite (if any)	To study this course, a student must have had the subject Zoology in class B.Sc. I year/certificate.
5	Course Learning outcomes (CLO)	After completion of the course students will able to : 1. Understand chordate diversity of animals and their taxonomic position. 2. Identify the morphological and anatomical features and basis of chordate classification 3. Know economic importance and present status that will develop positive attitude towards conservation of biodiversity. 4. Differentiate the organism belonging to different taxa by studying comparative anatomy. 5. The project, assignment will give them a flavor of research in studying biodiversity, taxonomy besides improving their writing skills and lay foundation of career in Zoology.
6	Credit Value	4
7	Total Marks	Max. Marks: 30+70 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical : 02 hours per week

LTP:

No. of Lectures = 60

Unit	Topics	No. of Lectures
I	**1. Introduction to Chordates** 1.1 Traditional Knowledge on Animal Science in anicient Indian Civilization 1.2 Origin of Chordates, General characteristics and outline classification of Phylum Chordata up to orders according to Parker and Haswell, Seventh Edition **2. Protochordata** 2.1. General characteristics and classification of Sub- Phylum Urochordata and Cephalochordata. 2.2. Type study of Herdmania and retrogressive metamorphosis in ascidian tadpole.	12

Theory Syllabus

Part A- Introduction			
Program : Diploma	Class:B. Sc.	Year: II Year	Session: 2022 - 23
Subject: Zoology			

1	Course Code	S2-ZOOL2T	
2	Course Title	Physiology and Biochemistry (Paper II)	
3	Course Type (Core Course/Elective/Generic Elective/Vocational.....)	Core course	
4	Pre-requisite (if any)	To study this course, a student must have had the Subject Zoology in class B.Sc. I year /certificate.	
5	Course Learning outcomes (CLO)	Upon completion of the course, Students will be able to 1 Understand how organs function at different levels i.e. from cellular to system levels. 2 Examine internal harmony of different body systems by learning inherent disorders and deficiencies, which is needed to maintain good health. 3 Understand functions of biomolecules & their role in metabolism by studying biochemistry. 4 Develop a strong foundation for research & employability skills 5 Improve the student's perspective of health biology through deep study of physiology.	
6	Credit Value	4	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks : 33

Part B – Content of the Course

Total No. of Lectures-Tutorials-Practical : (2 Hours per Week) L-T-P : No. of Lectures= 60

Unit	Topics	No. of Lectures
I	**Introduction and Historical background of Physiology and Biochemistry Biomolecules and Regulatory mechanism.** **1. Contribution of Indian Scientists** 1.1 Contribution of Charak 1.2 Contribution of Sushrut **2. Biomolecules** 2.1 Micro and Macro molecules 2.2 Water and Buffer System 3. Enzymes 3.1 Definition and General Properties 3.2 Nomenclature and Classification and functions 3.4 Mechanism and Regulation of Enzyme action 3.5 Co-Enzyme 4. Vitamins and Minerals 4.1 Types and Sources 4.2 Biological importance 4.3 Deficiencies and Disorders **Key words/Tags :** Biomolecules, Buffer system, Enzymes, Vitamins,	12

Part A - Introduction			
Program: Certificate	Class: B.Sc. I Year	Year: 2021	Session: 2021-2022
Subject: Physics			
1.	Course Code	S1-PHYS1T	
2.	Course Title	Thermodynamics and Statistical Physics (Paper I)	
3.	Course Type (Core/Elective/Generic Elective/Vocational/...)	Core course	
4.	Pre- requisite (If any)	To study this course, a student must have had the subject Physics in 12th class.	
5.	Course Learning Outcomes (CLO)	1. The course would enable the students to understand the basic Physics of heat and temperature in relation to energy, work, radiation and matter. 2. The students are expected to learn that "how laws of thermodynamics are used in a heat engine to transform heat into work". 3. This course will also develop an understanding of the various concepts of statistics and the methods to apply them in thermodynamics. 4. Students will understand the importance of studying statistical mechanics with the behavior of particles under classical and quantum conditions.	
6.	Credit Value	4	
7.	Total Marks	Max. Marks: 25+75	Min. Passing Marks: 33

Part A - Introduction			
Program: Certificate	Class: B.Sc. I Year	Year: 2021	Session: 2021-2022
Subject: Physics			

1.	Course Code	S1-PHYS2T
2.	Course Title	Mechanics and General Properties of Matter (Paper 2)
3.	Course Type (Core/Elective/Generic Elective/Vocational/...)	Core course
4.	Pre- requisite (If any)	. To study this course, a student must have had the subject Physics in 12th class.
5.	Course Learning Outcomes (CLO)	1. The course would empower the students to develop the idea about the behavior of physical bodies. 2. It will provide the basic concepts related to the motion of all the objects around us in daily life. 3. The students would be able to build foundation to various applied field in science and technology especially in the field of mechanical engineering. 4. The students will acquire the knowledge of basic mathematical methods to solve the various problem in physics. 5. The students will be able the understand the relativistic effect and the relation between energy and mass.
6.	Credit Value	4
7.	Total Marks	Max. Marks: 25+75 / Min. Passing Marks: 33

Part A - Introduction			
Program: Diploma	Class: B.Sc.	Year: Second	Session: 2022-2023
Subject: Physics			

1.	Course Code	S2-PHYS1T
2.	Course Title	Waves and Optics (Paper I)
3.	Course Type (Major/ Minor/Elective/Generic Elective/Vocational/...)	Major - I
4.	Pre- requisite (If any)	To study this course, the student must have passed B.Sc. first year with Physics.
5.	Course Learning Outcomes (CLO)	After the completion of the course, the student should be able to 1. Develop an understanding of various aspects of harmonic oscillations and waves specially superposition of collinear and perpendicular harmonic oscillations. 2. Explain several phenomena of daily life that can be explained as wave phenomena. 3. Understand various optical phenomena, principles, workings and applications. 4. Use the principles of wave motion and superposition to explain the Physics of polarisation, interference and diffraction.
6.	Credit Value	4
7.	Total Marks	Max. Marks: 30+70 | Min. Passing Marks: 33

Part B - Content of the Course

Total number of Lectures (in hours): 60

Unit	Topics	Number of Lectures
I	Waves 1. Superposition of Two Collinear Harmonic oscillations: Linearity and Superposition Principle: (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). 2. Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods; Lissajous Figures (1:1 and 1:2) and their uses. 3. Wave Motion: Transverse waves on a stretched string; Travelling and standing waves; Normal Modes of a string; Phase velocity; Group velocity; Plane and Spherical waves; Wave intensity.	12

Part A - Introduction			
Program: Diploma	Class: B.Sc.	Year: Second	Session: 2022-2023
Subject: Physics			

1.	Course Code	S2-PHYS2T
2.	Course Title	Electricity Magnetism and Electromagnetic theory (Paper 2)
3.	Course Type (Major/ Minor/Elective/Generic Elective/Vocational/...)	Major - 2, Minor and Elective
4.	Pre- requisite (If any)	To study this course, the student must have passed B.Sc. first year with Physics.
5.	Course Learning Outcomes (CLO)	After the completion of the course, the student should be able to 1. Understand the basic concepts of electricity and magnetism and their applications. 2. Apply various network theorems and their applications in electronics, electrical circuit analysis, and electrical machines. 3. Understand the construction and working of ballistic galvanometer and cathode ray oscilloscope. 4. Understand the concept of electromagnetic waves and their reflection and refraction from a plane surface.
6.	Credit Value	4
7.	Total Marks	Max. Marks: 30+70 / Min. Passing Marks: 33

Part B - Content of the Course

Total number of Lectures (in hours): 60

Unit	Topics	Number of Lectures
I	**Electrostatics** 1. An overview of thermal and hydroelectric power plants in Madhya Pradesh. 2. Electrostatic field; Electric flux; Gauss's theorem of electrostatics; Applications of Gauss theorem: Electric field due to infinite long charged wire; Uniformly charged spherical shell and solid sphere; Charged plate; Conservative nature of electrostatic field; Laplace and poisons equations; Uniqueness theorem. 3. Dielectrics; Polar and non-polar molecules; Parallel plate capacitor with a dielectric; Electrical susceptibility and	12

PART A: Introduction			
Program: Certificate	Class: B.Sc.	Year: I Year	Session: 2021-22
Subject: Computer Science			

1.	Course Code	S1-COSC 1T	
2.	Course Title	Computer System Architecture (Paper I)	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	Core Course	
4.	Pre-Requisite (if any)	To study this course, a student must have had the subject Physics/Maths in 12th class.	
5.	Course Learning Outcomes(CLO)	On completion of this course, learners will be able to: 1. Understand the basic structure, operation and characteristics of digital computer. 2. Be able to design simple combinational digital circuits based on given parameters. 3. Familiarity with working of arithmetic and logic unit as well as the concept of pipelining. 4. Know about hierarchical memory system including cache memories and virtual memory. 5. Understand concept and advantages of parallelism, threading, multiprocessors and multicore processors. 6. Know the contributions of Indians in the field of computer architecture and related technologies.	
6.	Credit Value	Theory – 4 Credits	
7.	Total Marks	Max. Marks : 25+75	Min. Passing Marks: 33

PART B: Content of the Course

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Module	Topics	No. of Lectures
1	**Fundamentals of Digital Electronics**: Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Binary and other Codes, Error Detection Codes. **Logic Gates**, Boolean Algebra, Map Simplification, Combinational Circuits, Sequential Circuits, simple combinational circuit design problems. **Circuits**- Adder- Subtractor, Multiplexer, Demultiplexer, Decoders, Encoders Flip - Flops, Registers, Counters.	10

Abhilasha Kumar

PART A: Introduction			
Program: **Certificate**	Class: B.Sc.	Year: **I Year**	Session: **2021-22**
Subject: **Computer Science**			

1.	Course Code	SI-COSCZT	
2.	Course Title	**Programming Methodologies & Data Structures (Paper Z)**	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Core Course**	
4.	Pre-Requisite (if any)	To study this course, a student must have had the subject Physics/Maths in 12th class.	
5.	Course Learning Outcomes(CLO)	**On completion of this course, learners will be able to:** 1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles. 2. Writing efficient and well-structured computer algorithms/programs. 3. Learn to formulate iterative solutions and array processing algorithms for problems. 4. Use recursive techniques, pointers and searching methods in programming. 5. Will be familiar with fundamental data structures , their implementation; become accustomed to the description of algorithms in both functional and procedural styles 6. Have knowledge of complexity of basic operations like insert, delete, search on these data structures. 7. Possess ability to choose a data structure to suitably model any data used in computer applications. 8. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc. 9. Assess efficiency tradeoffs among different data structure implementations. 10. Implement and know the applications of algorithms for searching and sorting etc. 11. Know the contributions of Indians in the field of programming and data structures.	
6.	Credit Value	**Theory – 4 Credits**	
7.	Total Marks	Max. Marks : **25+75**	Min. Passing Marks: **33**

Abhilasha Kumar

PART A: Introduction			
Program: Diploma	Class: B.Sc.	Year: II Year	Session: 2022-23
Subject: Computer Science			

1.	Course Code	S2-COSC1T
2.	Course Title	Computer Networks & Information Security
3.	Course Type (Core Course/ Elective/ Generic Elective/ Vocational	CoreCourse -(Major – I)
4.	Pre-Requisite (if any)	NIL
5.	Course Learning Outcomes (CLO)	After completing this course student will be able to: 1. Define and describe the components of Data Communications System such as various protocols, OSI Model, data transmission in analog and digital format. 2. Identify and differentiate among the network devices and drivers. 3. Learn and describe various error detection and correction methods. Define the various terminologies used in Network and Application layers. 4. Compare the various network technologies and can decide the suitable technology installation as per requirement and environment at any work place. 5. Describe the various protocols and can identify the application areas of each protocol. 6. Know the fundamentals of network and information security issues, laws, and various security technologies which can be applied on work place.
6.	Credit Value	Theory – 4 Credits Practical – 2 Credits
7.	Total Marks	Max. Marks: 30+70 / Min. Passing Marks: 33

PART B: Content of the Course		
No. of Lectures (in hours per week): 2 Hrs. per week		
Total No. of Lectures (in hours):60 Hrs.		
Module	**Topics**	**No. of Lectures**
I	**Introduction to Computer Network:** **Use of computer network:** Access to information, person to person communication, electronic commerce, internet of things; **Types of computer network:** Broadband access network, Mobile and wireless network, content delivery network, transit network, Enterprise network. **Network Technology:** Personal Area Network, Local Area Network,	8

Abhilasha Kumar

PART A: Introduction			
Program: **Diploma**	Class: B.Sc.	Year: II Year	Session: 2022-23
Subject: Computer Science			

1.	Course Code	S2-COSC2T	
2.	Course Title	Object Oriented Programming with Java	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	Core Course – (Major – II) / Minor / Elective	
4.	Pre-Requisite (if any)	To study this course, a student must have successfully completed the course on Programming Methodology at Certificate Level.	
5.	Course Learning Outcomes(CLO)	After the completion of this course, a successful student will be able to do the following: 1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity. 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to a specific problem. 3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved. 4. Demonstrate understanding and use of different exception handling mechanisms and concepts of multi-threading for robust faster and efficient application development. 5. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events. 6. Identify, Design & Develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.	
6.	Credit Value	Theory - 4 Credits Practical – 2 Credits	
7.	Total Marks	Max. Marks : 30+70	Min. Passing Marks: 33

Format for Syllabus of Theory Paper

Part A Introduction				
Program: Certificate/Diploma Degree/		Class: BA 1 Year	Year: 2021	Session: 2021-22
Subject: Political Science				
1	Course Code	A1-POSC1T		
2	Course Title	Political Theory		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course		
4	Pre-requisite (if any)	To study this course, a student must have passed 12th. Student of any subject can study this course.		
5	Course Learning outcomes (CLO)	1. Student will be able to understand meaning and significance of Political theory, different ideologies and approaches. 2. They will be able to explain concept of state and its changing nature. 3. They will learn what is power and authority and how they are interwoven. These two concepts will further enhance their understanding of politics. 4. They will be able to learn different dimensions of sovereignty and its relation with state. 5. They will be able to explain liberty, equality, justice and rights. Understanding of these key political concepts will facilitate students in real political world. 6. They will be able to explain different models of democracy and theories of representation.		
6	Credit Value	6		
7	Total Marks	Max. Marks: 25+75	Min. Passing Marks:33	

Part B- Content of the Course

Total No. of Lectures (in hours per week): 6 Hours per week
Total Lectures- 90 Hours

Unit	Topics	No. of Lectures
1	Understanding Political Theory 1. Political Theory: Meaning and Significance 2. Approaches to study of Politics 3. Different terms- Political Science, Political Philosophy, Political Theory, Political Thought and Politics 4. Introducing Ideologies	18
2	Concept of State 1. Defining State, Elements of state 2. Theories of Origin of State	15

Dr. J.C. Sinha

Format for Syllabus of Theory Paper

Part A Introduction			
Program: Certificate/Diploma Degree/	Class: BA I Year	Year: 2021	Session: 2021-22
Subject: Political Science			

1	Course Code	A1-POSC2T
2	Course Title	Indian Constitution
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course
4	Pre-requisite (if any)	To study this course, a student must have passed 12th. Student of any subject can study this course.
5	Course Learning outcomes (CLO)	1. Students will be able to understand the constitutional development in India. 2. They will be able to answer how constituent assembly was formed. 3. They will be able to describe the significance of the Preamble, Fundamental rights and Directive Principles of State Policy in the constitutional design of India. 4. They will be able to answer questions pertaining to the function and role of the President, Prime Minister, Governor, Chief Minister, Parliament and State legislature, and the courts in the Constitutional design of India. 5. They will be able to identify the power division in constitutional setup.
6	Credit Value	6
7	Total Marks	Max. Marks: 25+75 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures (in hours per week): 6 Hours per week
Total Lectures- 90 Hours

Unit	Topics	No. of Lectures
1	Genesis of the Indian Constitution and Salient Features 1. Constitutional Development in India.	18

Dr. J. C. SINHA
Professor

Format for Syllabus of Theory Paper

Part A Introduction			
Program: Diploma	**Class: BA**	**Year: Second**	**Session: 2022-23**
Subject: Political Science			

1	**Course Code**	A2POSC1T
2	**Course Title**	**Western Political Thought**
3	**Course Type (Core Course/Elective/Generic Elective/Vocational/.....)**	**Core Course**
4	**Pre-requisite (if any)**	**To study this course, a student must have passed certificate course in First Year.**
5	**Course Learning outcomes (CLO)**	1. The students will understand the significance of study of Political Philosophy. 2. The students will know the key ideas of Greek Political thinkers Plato and Aristotle 3. They will be able to explain what was the ideal state according to Plato and how was it linked to his scheme of education and theory of justice. 4. They will be able to answer how Aristotle differed from his master Plato on the conception of justice. 5. They will be able to answer why Machiavelli is called the child of his age. 6. They will be able to answer how and why Machiavelli gave an overriding priority to pragmatism above ethics and values in operation of statecraft. 7. They will be able to make a distinction among Hobbes, Locke, and Rousseau on the state of nature, the law of nature, nature and form of contract and the emergence of state from the contract. 8. Students would learn the key ideas of idealist thinkers 9. Students would learn the key ideas in Marxism and will be able to answer the Socialist and communist tradition after Marx in Political ideas of Lenin and Laski.
6	**Credit Value**	6
7	**Total Marks**	Max. Marks: 30+70 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures (in hours per week): 6 Lectures per week

Unit	Topics	No. of Lectures
1	**Greek Political Thought** • Plato 1. Theory of Justice 2. Theory of Education 3. Theory of Communism 4. Philosopher King 5. The Ideal State	18

Dr. J. C. SINHA
Professor,

Syllabus of Understanding Gandhi and Ambedkar

Part A Introduction				
Program:Diploma		Class: BA	Year: Second	Session: 2022-23
Subject: Political Science				
1	Course Code	A2POSC2T		
2	Course Title	Indian Political Thinkers		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course		
4	Prerequisite (if any)	To study this course a student must have passed a certificate course in First year.		
5	Course Learning outcomes (CLO)	1. Students will be able to think of Manu and Kautalya. 2. Students will be able to explain Social and Political Ideas of Rajaram Mohan Roy, Swami Vivekananda, Lokmanya Bal Gangadhar Tilak, Shri Aurobindo Ghosh. 3. They will be able to explain the key ideas of Mahatma Gandhi, Jawaharlal Nehru, Subhas Chandra Boseand Dr. Bhimrao Ambedkar 4. Students will be able to evaluate the ideas of M.N.Roy. Ram Manohar Lohia, Jayaprakash Narayan and Pt. Deendayal Upadhyaya. 5. They will be able to understand the contribution of Women in Indian Political Thought.		
6	Credit Value	6		
7	Total Marks	Max. Marks:70+30	Min. Passing Marks:33	

Part B- Content of the Course

Total No. of Lectures: 6 Lectures in a week

Unit	Topics	No. of Lectures
1.	1. Indian Political Thought: Introduction, Nature, Sources, Features 2. Manu: Ideas of State- The Origin and Form of the State, Saptanga Philosophy, Ideas of The Exchequer and Economics, Mandala Principles and Sixfold Policy. 3. Kautilya: State-related ideas- The origin and nature of the State, the Saptanga Doctrine, the Council of Ministers, the Justice and Penal System, the Mandal Doctrine and the Sixfold Policy.	18
2.	1. Rajaram Mohan Roy: Ideas on social reform, ideas of freedom and equality 2. Swami Vivekananda: the spiritual basis of humanism, the idea of freedom, the essence of socialism. 3. Lokmanya Bal Gangadhar Tilak: Social Reform Programme, National Education and Nationalism, Swadeshi and Swaraj 4. Shri Aurobindo Ghosh: Concept of Nationalism, Ideas related to Freedom.	18
3.	1. Mahatma Gandhi: Spiritualization of Politics, The Ends and Means Relationship, The Idea of Non-Violence and Satyagraha, State, Economic Thought 2. Pt. Jawaharlal Nehru: Ideas of Nationalism,	18

Dr. J. C. SAINI

BA I Year: English Literature

Part A Introduction			
Program: Certificate Course	Class': BA	Year: I	Session: 2021-22
Subject: English Literature (Theory)			

1	Course Code	A1-E.LIT.1.1	
2	Course Title	Study of Drama (Paper I, Theory)	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course	
4	Pre-requisite (if any)	To study this course, a student must have had the subject English Language/ English Literature in class 12th.	
5	Course Learning outcomes (CLO)	The course will inculcate team work, communicative ability, creativity and aesthetic sense in students, enabling them to understand, in detail, drama and the theatre. Through this course, the students will acquire the knowledge of • Different genres of drama, like comedy, tragedy, epic theatre, and commedia dell'arte • Distinctive features of Sanskrit, Greek, English, American, and Indian plays • Dramatic techniques and elements like plot, theme, character, spectacle and narrative	
6	Credit Value	4 (Theory) + 2 (Practical)	
7	Total Marks	Max. Marks 25+75	Min. Passing Marks 33

Part B- Content of the Course

Total No. of (Theory) Lectures (in hours per week): 02
Total (Theory) Lectures: 60

Unit	Topics	No. of Lectures
I	• Classical Drama 1.1 Sophocles Oedipus Rex - Story Keywords: *Sanskrit theatre, Rasa theory,Classical tragedy, Greek tragedy, Greek theatre, Trilogy, Plot structure, Oedipus Complex, Electra Complex, Epic theatre*	15
II	• Renaissance Drama 2.1 Christopher Marlow, Dr. Faustus	18

Dr G S Gautam 31/8/21

BA I Year: English Literature

Part A Introduction				
Program: Certificate Course	Class`: BA	Year: I		Session: 2021-22
Subject: English Literature (Theory)				
1	Course Code	A1-ELIT2T		
2	Course Title	Study of Poetry (Paper 2, Theory)		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course		
4	Pre-requisite (if any)	To study this course, a student must have had the subject English Language/English Literature in class 12th.		
5	Course Learning outcomes (CLO)	The Study of Poetry will not only instruct and delight the students, but also inspire them to have positivity, creativity, and a new way of thinking. After the study of this paper, the students will be able: • to identify, interpret, analyze and appreciate the various elements of poetry; • to develop literary intellect, and • to appreciate the lyrical and sonorous quality of language.		
6	Credit Value	4 (Theory) + 2 (Practical)		
	Total Marks	Max. Marks: 25+75	Min. Passing Marks: 33	

Part B- Content of the Course		
Total No. of (Theory) Lectures (in hours per week): 02 Total (Theory) Lectures: 60		
Unit	Topics	No. of Lectures
I	• **Introduction to Literature and its classification -- Poetry from Chaucer to Milton** 1.1 Figures of Speech: Definition of Poetry according to the Poets discussed in this paper; Different ages with different socio-economic and political backgrounds; Literary Terminology 1.2 Geoffrey Chaucer: The Wife of Bath, The Pardoner (from *The Prologue to The Canterbury Tales*) 1.3 John Donne: Death Be Not Proud 1.4 John Milton: On His Blindness **Keywords/ Tags:** *Figurative language, Extended metaphor, Hyperbole, Imagery, Iambic pentameter, Foot line, Narrative poetry, Metaphysical poetry, Puritan era*	15

31/8/21

BA II Year: English Literature

Part A Introduction			
Program: Diploma Course	Class: BA	Year: II	Session: 2022-23
Subject: English Literature (Theory) Major-1			

1	Course Code	A2-ELIT1T
2	Course Title	Study of Prose (Paper 1, Theory)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course
4	Pre-requisite (if any)	**To study this course, a student must have had the subject *English Language and Literature* at her/his Certificate Course level.**
5	Course Learning outcomes (CLO)	After the completion of this course, the students will be able to: • Analyze literary devices, forms and techniques in order to appreciate and interpret the text, • Broaden analytical skills and develop critical thinking skills, • Cultivate wisdom and world-view within themselves; and • Develop language and communication skills and creativity.
6	Credit Value	4
7	Total Marks	Max. Marks: 30+70 / Min. Pass Marks:33

Part B- Content of the Course

Total No. of Lectures (in hours per week): 02
Total Lectures: 60 hours

Unit	Topics	No. of Lectures
I	1. Early Prose Writers 1.1 Prose and its forms 1.2 Michel de Montaigne: On Sorrow (Translated by Charles Cotton) 1.3 Francis Bacon: Of Studies, Of Truth 1.4 Oliver Goldsmith: The Man in Black Keywords/Tags: *Elizabethan age, Aphoristic essay, Satire, Brevity, Idiomatic language, Ornamental prose*	15
II	2. Eighteenth/ Nineteenth Century Prose 2.1 Joseph Addison: The Spectator's Account of Himself 2.2 William Hazlitt: On the Ignorance of the Learned 2.3 Charles Lamb: Dream Children	15

Dr G S Gautam 13.2.22

BA II Year: English Literature

Part A Introduction			
Program: Diploma Course	Class: BA	Year: II	Session: 2022-23
Subject: English Literature (Theory) Major-2/Minor/Optional			

1	Course Code	A2-ELIT2T	
2	Course Title	Study of Fiction (Paper 1, Theory)	
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	Core Course	
4	Pre-requisite (if any)	To study this course, a student must have studied the subject *English Language and Literature* at her/his Certificate Course level.	
5	Course Learning outcomes (CLO)	On completion of this course, the students will be able to engage with different narrative forms and views in fiction dealing with simple and complex issues. The course will motivate the students to: • Understand various aspects and forms of fiction, • Trace the origin and development of English novel, • Appreciate morality and humanity, • Improve the understanding of the world and the complexities of human mind; and • Expand creativity and imagination and enrich the vocabulary in a delightful manner.	
6	Credit Value	4	
7	Total Marks	Max. Marks: 30+70	Min. Pass Marks:33

Part B- Content of the Course

Total No. of Lectures (in hours per week): 02
Total Lectures: 60 hours

Unit	Topics	No. of Lectures
I	1. Forms of Early Fiction 1.1 Fiction and its types 1.2 Daniel Defoe: Robinson Crusoe 1.3 Samuel Richardson: Pamela	15

Part A: Introduction			
Program: Certificate Course	Class: B.A. I Year	Year: 2021	Session: 2021-2022
Subject: Geography			

1.	Course Code	A1 – GEOGLT	
2.	Course Title	*Paper – I: Human Geography: Environment and Culture*	
3.	Course Type (Core/ Elective/ Generic Elective/ Vocational/...)	Paper-1 Core course	
4.	Pre-requisite (If any)	To study the course, a student must have passed 12th Class.	
5.	Course Learning Outcomes (CLO)	After the completion of course, the students will be able to: i. Discuss and describe the major concepts and key principles of Human Geography including place, space, scale and landscape. ii. Appreciate the diversity of the cultural backgrounds and places. iii. Approach problem solving from a geographic perspective by understanding the role location plays.	
6.	Credit Value	Theory – 4	
7.	Total Marks	Max. Marks: 25+75	Min. Passing Marks: 33

16.8.21

Part A: Introduction

Program: Certificate Course	Class: B.A. I Year	Year: 2021	Session: 2021-2022

Subject: Geography

1.	Course Code	A1 - GEOG2T
2.	Course Title	*Paper -2: Physical Geography – Lithosphere (Geomorphology)*
3.	Course Type (Core/ Elective/ Generic Elective/ Vocational/...)	Core course
4.	Pre-requisite (If any)	To study the course, a student must have passed 12th Class.
5.	Course Learning Outcomes (CLO)	After the completion of course, the students will have ability to: i. Understand the internal structure of the earth, rocks that compose it and forces within the earth that act to deform it. ii. Learn about the contribution of ancient Indian scholars in the development of Physical Geography. iii. Analyze how the natural and anthropogenic operating factors affect the development of land forms. iv. Understand about the denudation processes that unceasingly act at the earth's surface to shape land forms and reduce relief. v. Assess the role of structure, stage and time in shaping the land forms.
6.	Credit Value	Theory – 4
7.	Total Marks	Max. Marks: 25+75 / Min. Passing Marks: 33

16.8.21

Part A: Introduction				
Program: Diploma Course		Class: B.A./B.Sc.	Year: II year	Session: 2022-2023
Subject: Geography				
1.	Course Code	A2 – GEOG1T		
2.	Course Title	*Paper – 1 : Economic Geography*		
3.	Course Type (Core/ Elective/ Generic Elective/ Vocational/...)	Core course		
4.	Pre-requisite (If any)	To study the course, a student must have passed Certificate Course.		
5.	Course Learning Outcomes (CLO)	After the completion of course, the students will be able to: i. Explain the role of historical, environmental, cultural and other factors responsible for the location and distribution of economic activities. ii. Establish and analyze spatial pattern of economic development. iii. Examine man's economic activities in light of his environment. iv. Learn about the selected industries of Madhya Pradesh.		
6.	Credit Value	Theory – 4		
7.	Total Marks	Max. Marks: 30+70		Min. Passing Marks: 33

17/2/2022

Part A: Introduction				
Program: Diploma Course		Class: B.A./ B.Sc	Year: II Year	Session: 2022-2023
Subject: Geography				
1.	Course Code	A2 – GEOG2T		
2.	Course Title	*Paper – 2: Physical Geography – Atmosphere (Climatology)*		
3.	Course Type (Core/ Elective/ Generic Elective/ Vocational/...)	Core course		
4.	Pre-requisite (If any)	To study the course, a student must have passed Certificate Course.		
5.	Course Learning Outcomes (CLO)	After the completion of course, the students will be able to: i. Appreciate the elements of Weather and Climate and its impact at different scales. ii. Learn about the knowledge of Weather and Climate Available in Ancient Indian Literature. iii. Learn about the climatic regions of the world and their basis. iv. Comprehend the climatic aspects and its bearing on the planet earth.		
6.	Credit Value	Theory – 4		
7.	Total Marks	Max. Marks: 30+70	Min. Passing Marks: 33	

17/2/2022

Part A Introduction

Program: Certificate Course	Class: B.Sc. I Year	Year: 2021	Session: 2021-2022

Subject: Mathematics

1	Course Code	S1-MATH2G
2	Course Title	Mathematical Logic and Sets
3	Course Type	Elective
4	Pre-requisite (if any)	Open for all
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: 1. Using the principles of logic to distinguish between sound and unsound reasoning in discourse of everybody. 2. Construct truth tables for logical expressions: test statements for logical equivalence and represent mathematical statements in the language of predicate language. 3. Using the appropriate set theoretic concepts, thinking process, tools and techniques in the solution to various conceptual or real-world problems.
6	Credit Value	Theory: 4
7	Total Marks	Max. Marks: 25 + 75 | Min. Passing Marks: 33

Part B - Content of the Course

Total No. of Lectures (in hours per week): 2 hours per week

Total Lectures: 60 hours

Unit	Topics	No. of Lectures
I	**Mathematical Logic - I:** 1.1 Propositions and Truth table 1.2 Negation, Conjunction and Disjunction 1.3 Implications and Double implication 1.4 Bi-conditional propositions 1.5 Contrapositive Implication and converse 1.6 Contrapositive and inverse propositions	15
II	**Mathematical Logic - II:** 2.1 Precedence of logical operators 2.2 Tautology and Contradiction 2.3 Propositional equivalence: Logical equivalences 2.4 Predicates and quantifiers 2.4.1 Introduction 2.4.2 Quantifiers 2.4.3 Binding variables and Negations	15

16.08.21
Dr. Amit Rajput

Part A Introduction				
Program: Diploma Course		**Class:** B.A./B.Sc. II Year	**Year:** 2022	**Session:** 2022-23
Subject: Mathematics				
1	**Course Code**	S2-MATH2T		
2	**Course Title**	Advanced Calculus and Partial Differential Equations		
3	**Course Type**	Major – 2/Minor/Elective		
4	**Pre-requisite (if any)**	To study this course, a student must have had the subject Mathematics in Certificate Course or equivalent.		
5	**Course Learning Outcomes (CLO)**	The course will enable the students to: 1. Understand many properties of the real line R and sequences. 2. Calculate the limit superior, the limit inferior, and the limit of a bounded sequence. 3. Apply the mean value theorems and Taylor's theorem. 4. Apply the various tests to determine convergence and absolute convergence of an infinite series of real numbers. 5. Formulate, classify and transform partial differential equations into canonical form.		
6	**Credit Value**	**Theory:** 6		
7	**Total Marks**	**Max. Marks:** 30 + 70	**Min. Passing Marks:** 10 + 23	

Part B - Content of the Course		
Total No. of Lectures (in hours per week): 3 hours per week **Total Lectures:** 90 hours		
Unit	**Topics**	**No. of Lectures**
I	1.1 Historical background: 1.1.1 A brief historical background of Calculus and partial differential equations in the context of India and Indian heritage and culture 1.1.2 A brief biography of Bodhayana 1.2 Field structure and ordered structure of R, intervals, bounded and unbounded sets, supremum and infimum, completeness in R, absolute value of a real number. 1.3 Sequence of real numbers 1.4 Limit of a sequence 1.5 Bounded and monotonic sequences 1.6 Cauchy's general principle of convergence 1.7 Algebra of sequence and some important theorems	18

Name of BOS: Mathematics
Date: 15.02.2022

Signature of the Chairman (BOS):
Name: Dr. Anil Rajput

Part A Introduction				
Program: Diploma Course		**Class:** B.Sc. II Year	**Year:** 2022	**Session:** 2022-23
Subject: Mathematics				
1	**Course Code**	S2-MATH1G		
2	**Course Title**	Trigonometry, Calculus and Differential Equations		
3	**Course Type**	Generic Elective		
4	**Pre-requisite (if any)**	This course can be opted as an elective by the students of all subjects who do not have Mathematical Background at 12th level.		
5	**Course Learning Outcomes (CLO)**	The course will enable the students to: 1. Understand the trigonometrical functions. 2. Find out Maxima and minima of various functions. 3. Solve simple problems related to real-life situations. 4. Use of differential equations approach in different areas of business and science. 5. Formulate the differential equations of first order and first degree for various mathematical problems.		
6	**Credit Value**	**Theory:** 6		
7	**Total Marks**	**Max. Marks:** 30 + 70	**Min. Passing Marks:** 10 + 23	

Part B - Content of the Course		
Total No. of Lectures (in hours per week): 3 hours per week **Total Lectures:** 90 hours		
Unit	**Topics**	**No. of Lectures**
I	**Trigonometric Functions:** 1.1 Positive and negative angles 1.2 Measuring angles in radians and in degrees and conversion of one into other 1.3 Definition of trigonometric functions with the help of unit circle 1.4 Truthness of the $\sin^2 x + \cos^2 x = 1$, for all x 1.5 Signs of trigonometric functions 1.6 Domain and range of trigonometric functions and their graphs 1.7 Expressing $\sin(x \pm y)$ and $\cos(x \pm y)$ in terms of sinx, siny, cosx and cosy and their simple application	22
II	**Calculus:** 2.1 Definition of derivative 2.2 Derivative of sum, difference, product and quotient of functions 2.3 The derivative of polynomial and trigonometric functions 2.4 Integration of various functions by using substitution, partial fractions and by parts 2.5 Evaluation of simple integrals 2.6 Basic properties of definite integrals 2.7 Evaluation of definite integrals	23

Name of BOS: Mathematics
Date: ...15.02.2022.....

Signature of the Chairman (BOS):
Name: Dr. Anil Rajput

List of Cos/POs for Post-Graduation Program

Sr.NO.	Course
1	Botany
2	Chemistry
3	Zoology
4	Maths

RAJA BHOJ GOVERNMENT COLLEGE KATANGI, BALAGHAT, MADHYA PRADESH

(Affiliated by Chhindwara University, Chhindwara)

Program Outcomes, Program Specific Outcomes and Course Outcomes

DEPARTMENT OF BOTANY

Program Outcomes

The Botany post-graduate program is designed to accomplish the following outcomes:

PO-1 **Disciplinary knowledge:** Introduce students to the variety of plant life forms. Appreciate the highly developed areas of biological sciences, particularly Botany and its applied branches.

PO-2 **Critical thinking and problem solving:** Develop the ability to apply acquired knowledge in a variety of settings in order to make our country self-sufficient. Capability in statistical data analysis for better interpretation and problem solving.

PO-3 **Research Skills:** The ability to carry out innovative research projects, instilling in them the power of information creation. Consciousness to investigate the details of life forms at the cellular and molecular level.

PO-4 **Analytical reasoning:** Study and analyze any plant form using knowledge of basic science, life sciences, and fundamental plant processes.

PO-5 **Experimental Skills:** Develop, select, and apply appropriate techniques, resources, and instruments and equipment for biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue Culture Experiments, as well as cellular and physiological activities of plant.

PO-6 **Environmental awareness:** Instill an interest in and love of nature and its many living forms. Capability to raise awareness about natural resources and the environment, as well as the importance of conservation. Motivation to spread the concept of biodiversity conservation.

PO-7 **Digital literacy:** Develop skills in using technology to access, manage, manipulate, and create information in sustainable manner, to use information appropriately, and to generate new ideas.

PO-8 Social Interaction: Foster social skills and peer interaction so that they can make all people feel valued and respect their differences, resulting in a socially inclusive society.

Programme Specific Outcomes

On completion of M.Sc. (Botany) students will be able to:

PSO-1 Develop a clear understanding of subject and its applied branches.

PSO-2 Students acquired knowledge through practical work in fields as well as in laboratory.

PSO-3 Competent in the experimental techniques and analysis methods appropriate to their area of specialization in biology.

PSO-4 Competent in the application of fundamental statistical tools and physical principles (physics, chemistry) to the analysis of relevant biological situations.

PSO-5 Students will be able to explain how organisms work at the gene, genome, cell, tissue, organ, and organ-system levels.

PSO-6 Understand the physical characteristics of the environment, as well as the structure of populations, communities, and ecosystems.

PSO-7 Broaden the perspective on biodiversity conservation and resource sustainability.

PSO-8 Capable of self-study and social learning through the acquisition of digital skills.

COURSE OURCOMES

After Completing the course satisfactory, Students will be able to:

M.Sc. I Semester	
Paper: I (Biology and Diversity of Viruses, Bacteria and Fungi)	
S. No.	**Course Outcomes**
CO-1	Understand the characteristics, lsolation and purification, replication and transmission and economic importance of viruses.
CO-2	General accounl of Archaebacteria, Phytoplasma, Eubacteria, Cyanobacteria and Actinomycetes.
CO-3	Understand the general characteristics, physiology and growth, reproduction and phylogeny, economic importance and fungal disease of plant and animal.
CO-4	Understand the general account and life cycles of some members of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina and Deuteromycotina
CO-5	Understand the heterothallism and parasuxuality, mycorrhiza – VAM, mushroom

	cultivation. Production of alcoholic beverages, antibiotics and organic acids.
Paper: II (Biology and diversity of Algae)	
S. No.	**Course Outcomes**
CO-1	Understand the diversified habitat, thallus organization, pigment constitution, classification and morphological characters of algae.
CO-2	Understand the reproduction, biofertilizers and industrial uses of algae
CO-3	Understand the general characters and life cycle of some members of division cyanophyta, protochlorophyta, chlorophyta and charophyta.
CO-4	Understand the general characters and life cycle of some members of division Xanthophyta, Chrysophyta and Bacillariophyta.
CO-5	Understand the general characters and life cycle of some members of division Phaeophyta and Rhodophyta.
Paper: III (Biology and Diversity of Bryophyta & Pteridophyta)	
S. No.	**Course Outcomes**
CO-1	Understand the General characteristics, Classification, Dislribution, Ecology and Economic Importance of Bryophyta.
CO-2	Understand the General account and life cycles of some members of Marchantiales, Jungermanniales and Bryopsida orders.
CO-3	Understand the general characters and classification, Stelar system, Homospory, heterospory and seed habit in Pteridophytes, Geological time table and Fossilization.
CO-4	Understand the general characters and life cycle of some members of Psilotales, Lycophyta, Sphenopsida and Filicophyta.
CO-5	Understand Diversity and distribution of Pteridophytes in India.
Paper: IV (Biology and Diversity of Gymnosperms)	
S. No.	**Course Outcomes**
CO-1	Understand the General characteristics and Classification of Gymnosperms. Distribution of living Gymnosperms in India, Economic importance of Gymnosperms. Indian contribution of Gymnosperms.
CO-2	Understand the General account of Fossil gymnosperms - Lyginopteris, Glossopteris, Caytonia, Williamsonia and Pentoxylon.
CO-3	Understand the General account of Cycadeiodales, Cycadales, Cordaitales and Ginkgoales.

CO-4	Understand the General account of Coniferales - Life cycles of Pinus, Taxus, Biota, Cupressus & Araucaria.
CO-5	Understand the General account of Gnetales - Life cycles of Ephedra. Welwitchia & Gnetum.

M.Sc. II Semester	
Paper: I (Taxonomy of Angiosperms)	
S. No.	**Course Outcomes**
CO-1	Understand the international code of botanical nomenclature including modern trends of taxonomy and taxonomic literature.
CO-2	Understand the origin and evolution of Angiosperm and phenetic versus phylogenetic system of classification of angiosperms
CO-3	Understand the socio-economic importance, biodiversity and its conservation
CO-4	Understand the exhaustive and comparative study of some families of Magnoliopsida
CO-5	Understand the exhaustive and comparative study of some families of Liliopsida
Paper: II (Morphology, anatomy and embryology of Angiosperms)	
S. No.	**Course Outcomes**
CO-1	Understand the morphological structure of male and female reproductive parts, placentation, genetics and ABC model of flower development of angiosperms.
CO-2	Understand the development and organization of root, shoot and leaf system.
CO-3	Understand the anatomy of monocot and dicot root and stem and their anomalous secondary growth in some plants.
CO-4	Understand the ecological anatomy of stem, root and leaf of xerophytes, halophytes, hydrophytes, epiphytes, mesophytes and parasites.
CO-5	Understand the morphological structure and development male and female gametophytes of angiosperm plants.
Paper: III (Plant Ecology)	
S. No.	**Course Outcomes**
CO-1	Understand the ecosystem components, population ecology, community

	organization and community analytical and synthetic characters.
CO-2	Understand the ecosystem development, ecological stability concept, ecological perturbation and ecological restoration.
CO-3	Understand the organization of the ecosystem and mechanism of biogeochemical cycle.
CO-4	Understand the different kinds of pollution and their hazardous effects and sustainable development.
CO-5	Understand the major biomes, major vegetation and soil type of World and India also.
Paper: IV (Cell biology, genetics and plant breeding)	
S. No.	**Course Outcomes**
CO-1	Understand the structure and organization of plant cell and structure and functions of cell organelles.
CO-2	Understand the structure and function of extra chromosomal genome and also know about eukaryotic and prokaryotic chromosomes.
CO-3	Understand the Mendelian and neo Mendelian genetics and know about molecular mechanism of recombination and linkage.
CO-4	Understand the cell division, cell cycle and chromosomal aberrations.
CO-5	Study the various technique and importance of plant breeding.

M.Sc. III Semester	
Paper: I Plant Physiology	
S. No.	**Course Outcomes**
CO-1	Understand the potential redox reactions, Plant-Water relations, Transpiration and their role.
CO-2	Understand the Plants and inorganic Nutrients, Root-microbe interaction and Biological nitrogen fixation.
CO-3	Understand the Photochemistry, photosynthesis and photorespiration.
CO-4	Understand the respiration in plants and know about plant growth regulators and elicitors.

CO-5	Study the sensory photobiology and stress physiology in plants.
Paper: II (Biochemistry of Plant)	
S. No.	**Course Outcomes**
CO-1	Understand the structure, classification and biological importance of carbohydrates, lipids, amino acids, proteins, nucleotides and antibiotics.
CO-2	Understand the Principle role of Vitamins in metabolism and Deficiency diseases.
CO-3	Understand the concept, mode and mechanism action and kinetics of Enzymes.
CO-4	Understand the Bio-membranes composition and structure, Ion gated channals models and signal transduction in plants receptor system.
CO-5	Understand the chromatographic, mass spectrometry technique for bio-molecules characterization.
Paper: III (Molecular Biology and Plant Breeding)	
S. No.	**Course Outcomes**
CO-1	Understand the structure and function of DNA, nuclear DNA content and DNA replication.
CO-2	Understand the modern concept of gene and genetics recombination in Bacteria and Virus.
CO-3	Understand the transcription and translation in prokaryotes and eucaryotes.
CO-4	Understand the regulation of gene expression in prokaryotes and eucaryotes.
CO-5	Understand the Mutation: types, mutagens, mutagenesis, inherited human disease and defects.
Paper: IV (Conservation and Utilization of Plant Resources)	
S. No.	**Course Outcomes**
CO-1	Understand the plant resources and their utilization status in India.
CO-2	Understand the sustainable development of plant resources, biodiversity, hotspots, IUCN categories of threat.
CO-3	Understand the conservation strategies*: in situ* and *ex situ* conservation.
CO-4	Understand the general account of activities of Botanical survey of India (BSI) National Bureau of plant genetic resources (NBPGR), Indian council of Agricultural research (ICAR), Council of scientific and industrial Research (CSIR), The Department of Biotechnology (DBT).

CO-5	Understand the concept, tools and application of remote sensing. Know about Indian Remote sensing Program and application.

M.Sc. IV Semester	
Paper: I (Biotechnology, Tissue Culture and Genetic Engineering)	
S. No.	**Course Outcomes**
CO-1	Understand the principles and application of biotechnology and environmental biotechnology.
CO-2	Understand the tissue culture techniques and technical germplasm & cryopreservation.
CO-3	Understand the genetic engineering of plant, microbial genetic manipulation and genetic improvement of industrial microbes and nitrogen fixers.
CO-4	Understand the basic concept of recombinant DNA technology in genetic engineering.
CO-5	Understand the concept of bioinformatics, genomics and proteomics.
Paper: II (Instrumentation, Biostatistics and Biotechniques)	
S. No.	**Course Outcomes**
CO-1	Understand the some biophysics and molecular biology technique along with microbial culture technique.
CO-2	Study the biostatistics and basic statistics including knowledge to apply statistical analysis to biological data for testing different hypothesis.
CO-3	Understand the fundamentals of computers and use of computational approach to analyze, manage & store biological data. They are able to know, the use of information technology in biotechnology for data storage, Analyzing the DNA sequences.
CO-4	Understand the concept, tools and application of remote sensing. Know about Indian Remote sensing Program and application.
CO-5	Understand the analysis of water, heavy metals and microbial analysis of water according to WHO and local standards parameters.
Elective Paper: 1(B) Applied Mycology	
S. No.	**Course Outcomes**

CO-1	Study the taxonomic status, classification of fungi and harmful effect on human being and animals.
CO-2	Understand the different fermentation process and Microbial type culture collection and Gene bank (MTCC).
CO-3	Understand the fungi as food, medicines and industrial production of antibiotics.
CO-4	Understand the uses of fungi in industry, enzyme production and organic acids production.
CO-5	Understand the Principles and methods of fungal disease management and role in agriculture of fungi and Mycorrhiza.
Elective Paper: 2(C) Pollution Ecology	
S. No.	**Course Outcomes**
CO-1	Understand the concept, types of pollution and pollution problems of world/India /Madhya Pradesh level.
CO-2	Understand the composition, Sources, causes and effect of air & water pollution.
CO-3	Understand the causes, sources, effect and classification of soil pollution, metal pollution, solid wastes, hospital wastes, nuclear pollution etc.
CO-4	Understand the uses of fungi in industry, enzyme production and organic acids production.
CO-5	Understand the basic concept and applications of bioremediation, ecosystem restoration and Principles of some biophysics analytical methods

DEPARTMENT OF CHEMISTRY

Program Outcomes

The Chemistry post-graduate program is designed to accomplish the following outcomes:

PO-1 Determine molecular structure by using UV, IR and NMR.

PO-2 Study of medicinal chemistry for lead compound.

PO-3 Improve the Skill of student in organic research area.

PO-4 Synthesis of Natural products and drugs by using proper mechanisms.

PO-5 Study of Asymmetric synthesis.

PO-6 Determine the aromaticity of different compounds.

PO-7 Solve the reaction mechanisms and assign the final product.

Programme Specific Outcomes

On completion of M.Sc. (Chemistry) students will be able to:

PSO-1 Know the structure and bonding in molecules/ ions and predict the structure of molecule/ions.

PSO-2 Understand the various type of aliphatic, aromatic, nucleophilic substitution reaction.

PSO-3 Understand and apply principles of Organic Chemistry for understanding the scientific phenomenon in Reaction mechanisms.

PSO-4 Learn the Familiar name reactions and their reaction mechanisms.

PSO-5 Understand good laboratory practices and safety.

PSO-6 Study of organometallic reactions.

PSO-7 Study of free radical, bycyclic compound, conjugate addition of Enolates and pericyclic reactions.

PSO-8 Study of biological mechanisms using amino acids.

COURSE OURCOMES

After Completing the course satisfactory, Students will be able to:

M.Sc. I Semester	
Paper: I (Inorganic Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will understand the theories of chemical bonding in co-ordination chemistry.
CO-2	Students will interpret metal ligand equilibrium in solution through stepwise and overall formation constants, chelate effect, inert and labile complexes.
CO-3	Students will understand MOT, application of symmetry to MOT, stability of co-ordination compound and LFSE.
CO-4	Students will understand Metal ligand pi-bonding, metal carbonyl their preparation, classification, reactions and structure elucidation of metal carbonyls using IR.
CO-5	Students will understand classification of hard and soft acid, HSAB principle, it's application and metallurgy principle.
Paper: II (Organic Chemistry)	
S. No.	**Course Outcomes**
CO-1	**S**tudents will develop an understanding of nature of bonding in organic molecules, aromaticity, anti-aromaticity, homo-aromaticity, various reaction intermediates.
CO-2	Student will understand stereochemistry chirality, element of symmetry, R and S configuration and asymmetric synthesis.
CO-3	Student will learn reaction mechanism potential energy diagram, intermediates, TS, hammett equation and it's utility.
CO-4	Students will develop an understanding about elimination reaction mechanisms, aliphatic and aromatic nucleophilic substitution mechanisms.
CO-5	Student will understand conformational analysis of cyclohexanes and decalins, basic principle of green chemistry and their application in industrial process.
Paper: III (Physical Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will have an insight into the atomic structure, quantum Chemistry,

	Schrodinger equation and its application, basic idea about angular momentum.
CO-2	Students will study the application of Schrodinger equation to multielectron system through approximate methods.
CO-3	Student will understand the angular momentum, spin, antisymmetry and Pauli exclusion principle.
CO-4	Student will understand classical dynamics activity Coefficient, huckel theory, electrolytic solution and phase rule.
CO-5	Student will understand statistical thermodynamics, Fermi Dirac statistics, distribution law and application of helium.
Paper: IV (Group Theory and Spectroscopy)	
S. No.	**Course Outcomes**
CO-1	Students will study symmetry and group theory in chemistry and will be able to imagine and visualize the point group.
CO-2	Students will study Microwave Spectroscopy, classification of molecules, rigid rotator, non rigid rotator and stark effect.
CO-3	Students will study about IR spectroscopy.
CO-4	Students will study about Raman spectroscopy.
CO-5	Students will study Electronic Spectroscopy, franck -condon principle, photoelectric Spectroscopy, characterization and synthesis of nanoparticles.
Paper: V (Mathematics for Chemists)	
S. No.	**Course Outcomes**
CO-1	Students will be able to perform mathematical analysis of vectors, matrix algebra.
CO-2	Students will be able to perform differential calculus, bohar radius, and most probable velocity from Maxwell distribution law.
CO-3	Integral calculus, integration by parts, application of several variables, function of several variables, co-ordinate transformations.
CO-4	Students will be able to perform probability, combination and permutation.
CO-5	Students will be able to perform Curve Fitting using Linear and Nonlinear Regression.

M.Sc. II Semester	
Paper: I (Inorganic Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will understand the reaction mechanism in transition metal complexes, CFT.
CO-2	Students will understand square planar complexes, the trans effect, electron transfer reaction and Marcus Hush Theory.
CO-3	Students will understand Organometallic compound.
CO-4	Student will have an Understanding of Electronic Spectra of Transition Metal Complexes.
CO-5	Students will understand the Magnetic Properties of Transition Metal Complexes.
Paper: II (Organic Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will learn Aromatic Electrophilic Substitution and Aromatic Nucleophilic Substitution.
CO-2	Students will learn Free radical reaction, Free radical substitution mechanism. Free radical rearrangement.
CO-3	Students will understand Addition reaction, mechanism and stereochemical aspects.
CO-4	Students will understand addition to carbon- Hetero multiple Bond and elimination reactions.
CO-5	Students will learn pericyclic reaction, classification of pericyclic reaction and Green chemistry.
Paper: III (Physical Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will study the Chemical Dynamics, methods of determining, Rate Law Kinetic and thermodynamics law, enzymic reaction, nuclear Magnetic resonance method.
CO-2	Students will acquaint the Surface Chemistry and they will be able to imagine the structure of Micelles and Macromolecules**.**
CO-3	Students will study the Macromolecules, polymer and it's classification,

	polymerization mechanism, determination of molecular mass.
CO-4	Students will understand entropy balance equation for different is reversible processes, microscopic reversibility onsagar's reciprocal relations, electrokinetic phenomena.
CO-5	Students will understand Theories of Electrochemistry and Electrocatalysis.
Paper: IV (Spectroscopy and Diffraction methods)	
S. No.	**Course Outcomes**
CO-1	Students will study Nuclear Magnetic Resonance Spectroscopy.
CO-2	Students will study Nuclear Quadruple Resonance Spectroscopy.
CO-3	Students will understand Electron Spin Resonance Spectroscopy.
CO-4	Students will study X-ray Diffraction, Bragg condition, miller indices, X-ray analysis of crystal.
CO-5	Students will study Electron Diffraction, measurement technique, Neutron Diffraction Scattering.
Paper: V (Computer for Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will understand introduction to computer and computing, DOS, memory, introduction to UNIX and WINDOWS.
CO-2	Students will understand Computer programming in FORTRAN/BASIC.
CO-3	Students will learn developing of small computer code, and uses of computer in chemistry.
CO-4	Students will understand use of computer, X-Y plots Simpson's numerical integration method.
CO-5	Students will learn about Internet OMR, web camera, PDF and uses of internet in chemistry.

M.Sc. III Semester	
Paper: I (Application of Spectroscopy)	
S. No.	**Course Outcomes**
CO-1	Students will learn about the Electronic Spectroscopy. d^1 –d^9 system.

CO-2	Students will learn about the Vibrational Spectroscopy and its application.
CO-3	Students will learn NMR Spectroscopy –I, introduction and definition.
CO-4	Students will learn NMR Spectroscopy –II, NOE and NMR shift reagent.
CO-5	Students will understand basic principle and application of Mossbauer Spectroscopy.
Paper: II (Photochemistry)	
S. No.	**Course Outcomes**
CO-1	Students will learn about Photochemical reaction.
CO-2	Students will learn about determination of photochemical reaction mechanism.
CO-3	Students will study photochemistry of Alkenes and Aromatic compound.
CO-4	Students will study photochemistry of Carbonyl compound.
CO-5	Students will study photochemistry of Miscellaneous Photochemical reaction.
Paper: III (Environmental Chemistry)	
S. No.	**Course Outcomes**
CO-1	Student will know about Atmosphere, atmospheric chemistry and tropospheric chemistry, biogeochemical cycles of C.N.P.S.
CO-2	Student will study Air pollution, Acid rain, Green House effect and Urban Air pollution.
CO-3	Student will study Aquatic chemistry, Water pollution, treatment of water pollutant.
CO-4	Student will study Environmental Toxicology, Toxic Organic compound, Polychlorinated biphenyls and polynuclear Aromatic Hydrocarbons.
CO-5	Student will study Soil and Environmental Disasters. Bhopal gas tragedy, Chernobyl, etc. tragedy.
Paper: IV (Polymers)	
S. No.	**Course Outcomes**
CO-1	Student will study importance and basic concept of polymer.
CO-2	Student will study Polymer Characterization.
CO-3	Student will study, Analysis and testing of polymers.
CO-4	Student will understand about Inorganic Polymers.
CO-5	Student will study, Structure, Properties and Application of polymer.
Paper: V (Organo Transition metal Chemistry)	

S. No.	Course Outcomes
CO-1	Student will study Alkyls and Aryls of Transition Metals.
CO-2	Student will study Compound of Transition Metal-Carbon multiple Bond.
CO-3	Student will study Transition Metal pi-complexes.
CO-4	Student will study Transition Metal Compound with Bonds to Hydrogen, Homogeneous catalyst.
CO-5	Student will study Fluxional Organometallic compounds.

M.Sc. IV Semester	
Paper: I (Application of Spectroscopy)	
S. No.	**Course Outcomes**
CO-1	Understanding about Ultraviolet and visible spectroscopy, and various electronic transitions.
CO-2	Student will study about Infrared Spectroscopy and its application.
CO-3	Student will study about Nuclear Magnetic Resonance of Paramagnetic Substance in Solution.
CO-4	Student will study about instrumentation and application of Carbon-13 NMR Spectroscopy.
CO-5	Student will study about instrumentation and application of Mass Spectroscopy and mass spectral techniques.
Paper: II (Solid State Chemistry)	
S. No.	**Course Outcomes**
CO-1	Student will study general principle and experimental procedure of Solid State.
CO-2	Student will study Crystal Defects and Non-Stoichiometry.
CO-3	Study will study Electronic Properties, magnetic properties, Conductor, and Bond Theory.
CO-4	Student will study Organic Solids Electrically conducting solids, Superconductors.
CO-5	Student will study type and application of Liquid Crystal.
Paper: III (Biochemistry)	
S. No.	**Course Outcomes**

CO-1	Student will understand the Metal ions in biological system and Transport and Stora and of Dioxygen.
CO-2	Student will understand the structure and function of metal ions in electron transport in biological systems.
CO-3	Students will learn the role of enzymes and their function in various biochemical reactions.
CO-4	Students will study the co-enzyme chemistry and its biotechnological application.
CO-5	Students will study the basic of biological cells, its constituents, bioenergetics, biopolymer interaction and cell membrane.
Paper: IV (Analytical Chemistry)	
S. No.	**Course Outcomes**
CO-1	Students will study about introduction and classification of Analytical Chemistry and Errors and Evaluation.
CO-2	Student will understand Food analysis, Chromatography and its type.
CO-3	Student will understand Water Pollution, type, measurement, water pollution law.
CO-4	Student will study Analysis of Soil, Fuel, Body Fluids and Drugs.
CO-5	Student will study Clinical Chemistry and Drug analysis.
Paper: V (Medicinal Chemistry)	
S. No.	**Course Outcomes**
CO-1	Student will study Structure and activity of SAR and QSAR.
CO-2	Student will study Pharmacodynam and drug metabolism in medicinal chemistry.
CO-3	Student will study introduction and synthesis of Antibiotics and antibacterial.
CO-4	Student will study Antifungal and Antimalarials.
CO-5	Student will study Non –steroidal Anti-inflammatory Drugs.

DEPARTMENT OF ZOOLOGY

Program Outcomes

The Zoology post-graduate program is designed to accomplish the following outcomes:

PO-1 Ability to take certification of Master's degree in Zoology. Preparedness for various competitive exams like CSIR, GATE, DBT, JRF and also in government and private sectors.

PO-2 Ability to carry out original research in biology.

PO-3 Knowledge of the underlying genetic mechanism operating in man and state of the art bio-techniques

PO-4 Academically sound research abilities in the area of general biology, Molecular biology, Biotechnology, Genetics, Cell biology, and Environmental.

PO-5 Conservation Awareness about the tools/gadgets and accessories of biological research.

PO-6 In-depth knowledge on the methodology and perspectives of applied branches of zoology with a view of educating youngsters on the possibilities of self-employment. Knowledge of career opportunities in teaching, industry and research.

PO-7 In depth knowledge on the diversity and relationships in animal world.

PO-8 Critical evaluation ability in debates and take a stand based on science and reason.

Programme Specific Outcomes

On completion of M.Sc. (Zoology) students will be able to:

PSO-1 Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology, Bio molecules and structural Biology and applied Zoology.

PSO-2 Understand the nature and basic concepts of General and comparative Animal physiology and Endocrinology

PSO-3 Students will understand the basic concept of biosystmetics taxonomy

PSO-4 Analyze the relationships among animals, plants and microbes.

PSO-5 Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Entomology, Nematology Sericulture, Biochemistry, Fish biology, Animal biotechnology, Immunology and research methodology .

PSO-6 Student will understand the nutrition digestion and respiration of lower invertebrates.

PSO-7 Student will understand the Quantitative biology biodiversity and wildlife

PSO-8 Understand the applications of biological sciences in Apiculture, Aquaculture, Agriculture and Medicine.

PSO-1 Gains knowledge about research methodologies, effective communication and skills of problem solving methods.

COURSE OURCOMES

After Completing the course satisfactory, Students will be able to:

M.Sc. I Semester	
Paper: I (Biosystematics Taxonomy and Evolution)	
S. No.	**Course Outcomes**
CO-1	Students will understand the basic concept of biosystematics taxonomy.
CO-2	Explain the taxonomic keys.
CO-3	Students will understand the taxonomic categories.
CO-4	Students will understand the concept evolution and theories.
CO-5	Students will understand economically important animal wear to horse.
Paper: II (Structure and Functions of Invertebrates)	
S. No.	**Course Outcomes**
CO-1	**S**tudents will develop an understanding the origin of metazoan.
CO-2	Student will understand the nutrition digestion and respiration of lower invertebrates.
CO-3	Student will learn the excretion higher Invertebrates.
CO-4	Students will develop an understanding about the nervous system of Lower invertebrates.
CO-5	Student will understand the Invertebrate larval form and their evolutionary significance.
Paper: III (Quantitative biology, biodiversity and wildlife)	
S. No.	**Course Outcomes**
CO-1	Students will understand the central tendencies mean mod median chi-square test.

CO-2	Students will understand the probability distribution and analysis of variance.
CO-3	Students will understand the detail Biodiversity.
CO-4	Students will understand the values of wild Life.
CO-5	Students will understand the wild Life in M.P.
Paper: IV (Biomolecules and structural Biology)	
S. No.	**Course Outcomes**
CO-1	Students will understand the Chemical foundation of Biology.
CO-2	Fundamental understanding of proteins
CO-3	Students will understand the metabolism
CO-4	Students will understand the biosynthesis of DNA and RNA.
CO-5	Students will understand the enzyme classification mechanism and regulation

M.Sc. II Semester	
Paper: I (General and comparative Animal physiology and Endocrinology)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of respiration.
CO-2	Students will gain the knowledge of Digestion thermoregulation and osmoregulation.
CO-3	Students will gain the knowledge of chemoreception.
CO-4	Students will gain the knowledge of Endocrine glands.
CO-5	Students will gain the knowledge of hormones and their mechanism.
Paper: II (Population Ecology and Environmental physiology)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of populations and their characters.
CO-2	Students will gain the knowledge of adaptations in detailed.
CO-3	Students will gain the knowledge of environmental limiting factor.
CO-4	Students will gain the knowledge of conservation management of natural resources.
CO-5	Students will gain the knowledge of meditation Yoga and their effects.
Paper: III (Tools and Techniques in Biology)	
S. No.	**Course Outcomes**
CO-1	Understand the concept of microscopy.

CO-2	Students understand the various separation Techniques.
CO-3	Students understand the Immunological Techniques.
CO-4	Students understand histological techniques and cell culture techniques.
CO-5	Students understand molecules biology techniques.
Paper: IV (Molecular cell Biology and Genetics)	
S. No.	**Course Outcomes**
CO-1	Students understand the molecular structure and function of cell membrane.
CO-2	Students understand the cell signaling.
CO-3	Students understand the cell adhesion and communication.
CO-4	Students understand the sex determination.
CO-5	Students understand the Genetically diseases and Genomics.

M.Sc. III Semester	
Paper: I (Comparative Anatomy of vertebrates)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of origin and development of chordata.
CO-2	Students will gain the knowledge of Evolution of Heart and blood circulation.
CO-3	Students will gain the knowledge of comparative Anatomy of Brian and spinal cord
CO-4	Students will gain the knowledge of flight Adaptation vertebrates.
CO-5	Students will gain the knowledge of origin Evolution and ostrocord.
Paper: II (Limnology)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of the scope of Limnology.
CO-2	Students will gain the knowledge of the physiological chara Test.
CO-3	Students will gain the knowledge Biota and Ecological significance.
CO-4	Students will gain the knowledge of aquatic Environment.
CO-5	Students will gain the knowledge of use and misuse of Inland water.
Paper: III (Eco Toxicology)	
S. No.	**Course Outcomes**
CO-1	Understand the applications of Toxicology.

CO-2	Students understand the mechanism of Toxicity.
CO-3	Students understand the organ Toxicity.
CO-4	Students understand the public Health Hazard
CO-5	Students understand heavy metals and their role in Environment.
Paper: IV (Aquaculture)	
S. No.	**Course Outcomes**
CO-1	Students understand the aquaculture scope and Importance.
CO-2	Students understand the fresh water prawn culture.
CO-3	Students understand the transport of live fish and seed.
CO-4	Students understand the preservation and processing of Fish.
CO-5	Students understand the biochemical composition and nutritional value of fish.
M.Sc. IV Semester	
Paper: I (Animal Behaviour and Neurophysiology)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of relationships of Behavior and cognition
CO-2	Students will gain the knowledge of Evolution of neural and hormonal control of Behavior
CO-3	Students will gain the knowledge of feeding and Reproductive Behavior
CO-4	Students will gain the knowledge of thermoregulation and homoeothermic Animals.
CO-5	Students will gain the knowledge of relationships of Behavior and cognition
Paper: II (Gamete Biology Development and Differentiation in vertebrates)	
S. No.	**Course Outcomes**
CO-1	Students will gain the knowledge of the Differentiation of Gonads in mammals.
CO-2	Students will gain the knowledge of the sex Determination.
CO-3	Students will gain the knowledge Hormonal Regulation of Evolution.
CO-4	Students will gain the knowledge of Development of Gonads.
CO-5	Students will gain the knowledge of new cell types.
Paper: III (Ethnology (Fish) structure and function)	
S. No.	**Course Outcomes**
CO-1	Understand the origin and Evolution of fisheris.

CO-2	Students understand the respiratory organs.
CO-3	Students understand the Execration and osmoregulation.
CO-4	Students understand the deep sea adaptation
CO-5	Students understand parental care in Fishes.
Paper: IV (Pisciculture and Economic importance of fishers)	
S. No.	**Course Outcomes**
CO-1	Students understand the fish seed from natural resources
CO-2	Students understand the management of Hatcheries
CO-3	Students understand the of fisheries Resources of M. P.
CO-4	Students understand the role of fisheries in Rural Development.
CO-5	Students understand the marketing of fish in India.

DEPARTMENT OF ECONOMICS

Program Outcomes

The Economics post-graduate program is designed to accomplish the following outcomes:

PO-1 Students will enhance their knowledge in economic field.

PO-2 It helps to get a well resourced learning environment for economics.

PO-3 It allows the students to choose from a wide range of economic specialization.

PO-4 It provides employment in various fields like finance, education, administration and banking Sectors.

PO-5 They could analyze present economic situation by different theories and model of economics.

PO-6 Students will be gain to knowledge about how to stable a firm.

PO-7 They will be understanding importance of exchange rate in international trade.

Programme Specific Outcomes

On completion of M.A. (Economics) students will be able to:

PSO-1 Students will be able to apply supply and demand analysis in real life.

PSO-2 Students can understand and analysis economic variable like inflation, deflation, unemployment, poverty, GDP etc.

PSO-3 It helps students to get an idea of the behavior of Indian and world economy.

PSO-4 They could be understood international economic policy.

PSO-5 To understand importance of fiscal and monetary policy for economic stability.

COURSE OURCOMES

After Completing the course satisfactory, Students will be able to:

M.A. I Semester	
Paper: I (Micro Economic Analysis -I)	
S. No.	**Course Outcomes**
CO-1	Student will be known about Indifference curve -Income and Substitution effect for normal goods as well as substitution effect of Hicks and Slutsky compared. They

	will be gain to knowledge about revision of demand theory by Hicks and consumer choice in voting Risk.
CO-2	Student will understand Cobweb theorem and its importance. Knowledge about recentdevelopment in demand analysis.
CO-3	Students will be understood for a short and long period on production function. They willgain knowledge about iso-quant and Euler's theorem.
CO-4	Students will understand the difference between cobb-Douglas and CES production functions.
CO-5	Students will be known about marginal analysis approach to price and output determination. Students will be able to understand price determination by market force (demand and supply) and enable to explain.
Paper: II (Macro Economic Analysis -I)	
S. No.	**Course Outcomes**
CO-1	Student will be gain to knowledge about circular flow of income with foreign sector or four sectors economy. They will be known about social accounting and input-output accounting.
CO-2	Students will be understood the importance of psychological law of consumption in their real life experience. They will be gain to knowledge about life cycle and permanent income hypothesis.
CO-3	Students will be understood to importance investment of marginal theories. They will be understood about the acceleration and investment behavior.
CO-4	Students will be known to use about banking system in our behavior. They will be known function of RBI and importance of high powered money.
CO-5	They could be able understand IS- LM curve and its relation with bank rate.
Paper: III (Quantitative Methods -I)	
S. No.	**Course Outcomes**
CO-1	They could be able to understand concept of statistical population and sample variable attributes. Measure central tendency and dispersion and skewness
CO-2	Measure linear and simultaneous equation up to three variables and its application in economics. Calculations of microeconomics variable.

CO-3	Concept of simple differentiation and its application in Economics calculation of elasticity Coefficient marginal cost and revenue productivity. Measure correlation and Coefficient Spearman's rank correlation coefficient.
CO-4	Students will be understood regression analysis and its Coefficient and equalization understand methods of interpolation and extrapolation.
CO-5	known index number and problem in construction of index number understand living index number and fisher's ideal index
Paper: IV (Economics of Growth and Development)	
S. No.	**Course Outcomes**
CO-1	Concepts of economic development and growth and factors and Affecting economic growth and measurement of economic development.
CO-2	Understand different economic growth model like Keynesian technical progress hicksHarrod, learning by doing growth model of kaldor and production function approach to the economic growth.
CO-3	Understand concept of development and underdevelopment Perpetuation of the development measuring development and underdevelopment gap. Measurement of indicator of economic development like Human Development Index and other indicators of development and quality of life index.
CO-4	Students will be understood classical theory of economic development theories of social change surplus value and profit role of credit profit and degeneration of capitalism.
CO-5	Understand of Partial theories of growth and development like Vicious circle of poverty bigPush and doctrine of balanced and unbalanced growth.

M.AII Semester	
Paper: I (Micro Economic Analysis-II)	
S. No.	**Course Outcomes**
CO-1	Students will be gain to knowledge about Baumol's sales Revenue maximization model,Williamson's model and Marris model.
CO-2	Gain to knowledge by Marginal productivity theory for students. They will be learnt aboutRent, Wages, Interest and Profit of Determination.

CO-3	Students shall be learnt by Pigouvian welfare economics -Pareto optimal conditions, value judgment – social welfare function. They will gain to knowledge about Arrow's Impossibility theorem.
CO-4	Know about Walrasian Excess demand and Input-Output approaches. They will learn torelationship between relative commodity and factors prices (Stolper-samulasontheorem)
CO-5	Students shall be gain to understand about Individual behavior towards risk. They willunderstand by mean- variance analysis & portfolio selection.
Paper: II (Macro Economic Analysis-II)	
S. No.	**Course Outcomes**
CO-1	Students shall be learnt IS-LM model.
CO-2	Know the role of Patinkin and real balance effect. They will be gain to knowledge aboutBaumol and Tobin, Friedman and modern quantity theory.
CO-3	Students will understand Mundel flaming model.
CO-4	Students gain to knowledge about the role of Philips curve in short run and long run period. They will be understood about policies to control.
CO-5	Students will understand theories of Schumpeter, Kaldor, Samuelsson, Hicks and Godwin'smodel. They will learn the role of Business cycles.
Paper: III (Research Methodology and statistical inference)	
S. No.	**Course Outcomes**
CO-1	Understand meaning and concept of Research types of research. Apply the different sampling method. To learn variety of probability and non probability sampling method for selecting a sample from a population.
CO-2	Student will be understood analysis of time series and its component .Measurement of trendy by graphic method.
CO-3	Recognize common probability distribution for discrete and continuous variables. Apply normal binominal and poison distribution.
CO-4	Understand and apply T, F and Z Test procedure of testing hypotheses .standard error and sampling distribution estimation.
CO-5	Understand and apply Chi Square Test and analysis of Variance.

Paper: IV (History of thought)	
S. No.	**Course Outcomes**
CO-1	Students will be known nature and significance of history of economic thought and economic ideas of mercantilists understand physiocratic economic doctrines and its importance Know classical theory and its economic
CO-2	Understand economic thought of Sismondi, Simons, Fredrick list and JS mill. They could understand that Sismondi was neither is neither Classical nor a socialist.
CO-3	Students will be known Marx labour theory of Value, classification of historical School Ideas for historical school in the field of Economic doctrines, economic ideas of Mathematical economist and Australian economist.
CO-4	Know economics thought of Marshall, J B Clark, Irving fisher and Mitchell.
CO-5	Students will be able to know economic ideas of Mahatma Gandhi, Gandhism and communism, J.k. Mehta, Ranady, and Dadabhai Naroji.

M.A. III Semester	
Paper: I (Public Finance-I)	
S. No.	**Course Outcomes**
CO-1	Students will gain knowledge about public choice voting and resources allocation andpublic choice analysis .They will understand about the role of government in public choice.
CO-2	Students will understand concept and importance of Public finance. They will understandthe theory of Maximum social advantage.
CO-3	Identifies and understands Wagner's Law of increasing state activities and Wiseman Peacockhypothesis.
CO-4	Students will gain knowledge about theories of taxation, benefit theory, cost service theoryand ability to pay theory.
CO-5	Knows about public debt and economic growth. They will gain knowledge about deficitfinancing.
Paper: II (International Economics-I)	

S. No.	Course Outcomes
CO-1	Students will be gain to knowledge about features of inter-regional and international tradeas well as Smith theory and Ricardo theory comparative difference in cost.
CO-2	Students will understand by explanation of Mill concept of reciprocal demand with the helpof Marshall Offer curve.
CO-3	Knows about under constant, increasing and decreasing opportunity cost Haberler's theory. Student will we gain to knowledge about the modern theory of factor endowment its explanation under price and physical criticism and the Leontief Paradox
CO-4	Student will be learnt about Samuelsson factor price and term and trade with underdevelopment countries and concept of foreign exchange rate. They will understand purchasing power parity theory.
CO-5	Students will be gain to knowledge about effect of Tariff under Partial and general equilibrium optimum tariff and welfare affect of on income distribution the theorem. They will be known about anti dumping.
Paper: III (Labor Economics -I)	
S. No.	**Course Outcomes**
CO-1	Students will begin to knowledge nature and characteristic of labour market in developing country like India
CO-2	Know about labour policies at supply of labour in relation to growth of labour force students will understand the role employment service Organization in India.
CO-3	Student will be understood about poverty and employment in a developing country.
CO-4	Known about the role of features five years plan and public sector and deployment inagriculture sector.
CO-5	Student will be understood about concept of minimum wage, living Wage and fair wage in theory and practice.
Paper: IV (Industrial Economics-I)	
S. No.	**Course Outcomes**
CO-1	Students will be gain to know ledge about organization of a firm and its objectives

CO-2	Know about theories of industrial location Weber and Sergeant Florence.
CO-3	Student will understand about product pricing and the Role of investment Expenditure.
CO-4	Student will be gain to knowledge about growth of the firm in Indian situation.
CO-5	Students could understand the Role of public and private sectors in Indian economy. Students will be gain to knowledge about recent trend in Indian industrial growth – Multinational companies and Transfer of Technology-Liberation and Privatization.
M.A. IV Semester	
Paper: I (Public Economic Paper -II)	
S. No.	**Course Outcomes**
CO-1	Students will be known about classical view of Public Debt, compensatory aspect of debt Policy. Burden of Public debt, Sources of Public Debt. They will know about debt thought created money, public borrowing and price level. Student will be understood about principles of debt management and Repayment.
CO-2	Students will be gain to knowledge about fiscal Policy, full Employment, Anti-Inflation, Budgetary Deficit, and Balanced Budget Multiplier. They will Know about the Role and different between Fiscal Policy and Monetary Policy
CO-3	Students will be understood about Principles of Multi-Unit Finance, Fiscal Federation in India Vertical and Horizontal Imbalance. They will know of Assignment of Function and Sources of Revenue. They will be learnt to Role of Finance Commission and Planning Commission.
CO-4	Students will be gain to knowledge about Indian Tax System, Tax in India. They will understand different between direct and indirect Tex.
CO-5	Students will be known about The Role of Budgets in India. They will be learnt about Reports of Finance Commission in India.
Paper: II (International Economic-II)	
S. No.	**Course Outcomes**
CO-1	I Student will be able to know Forms of Economic Cooperation. They will be Understood Static and Dynamic Could Understood Concepts of SAARC/ SAPTA

	and ASEAN its Importance in International Trade
CO-2	Students will be learnt to Multilateralism and WTO as well as Importance of International Monetary Fund in India.
CO-3	Student will be Known about international organization like GATT/WTO (TRIPS/TRIMS)UNCALD, IMF, WORLD BANK and ASIAN Development Bank etc.
CO-4	Student wills Know Trade Problem and Trade Policies in India during The last Five years Plan as well as Known Recently Change in the Direction and Composition of trade in India.
CO-5	Student will be known about Rationale and Impact of Trade Reform Since 1991 on Balancedof Payment (BOP). Students will understand about what are problems of International Debt. KnowFunction and Regulation of Multi- National Company In India .students will enhance their about toknow Instruments of Export Promotion and Recent Import and Export Policies and agenda For Future.
Paper: III (Industrial Economics -II)	
S. No.	**Course Outcomes**
CO-1	Students will be understood by Regional Industrial Growth in India. They will know about Industrial economic Concentration and Remedial Measures. They will understand about Issues In Industrial Proliferation and Environmental Preservation and Pollution Control Policies. They will be learnt how to control pollution.
CO-2	Students will be gain to knowledge about Cost-Benefit analysis.
CO-3	Student will be known about The Role, Nature, Volume and Types of Institutional finance. They Could Understand Difference among IDBI, IFCI, SFCS, SIDC and Commercial Bank.
CO-4	Student will be able to know about Structure of Industrial Labour, employment Dimensionsof Indian Industry. Students will be known about Labour Wages and Problems with Suggest to Labour Reform in India.
CO-5	Student will be known about Role of IRON and SATEEL Industry, COTTON and TEXTILES, JUTE and SUGAR mill, COAL, CEMENT, Engineering goods, Small scale and Cottage Industrial in Development countries.

Paper: IV (Labour Economics -II)	
S. No.	**Course Outcomes**
CO-1	Students will be gain to knowledge about inflation wage relationship at micro and macro level, Productivity and wage relationship analyses of rigidity in labour market. They will be understood National wages policy.
CO-2	They will be understood theory of labour movement, Growth pattern and structure of labour union in India. They will know about achievement of labour union and role of tripartism.
CO-3	Students will be gain to knowledge about collective bargaining, judicial activism, Indian labour law and practices.
CO-4	Students will understand state and social security of labour, child and female labour and how to overcome special problem of labour in India.
CO-5	Knows about second National labour commission and its objectives.

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(Affiliated by Chhindwara University, Chhindwara)

Program Outcomes, Program Specific Outcomes and Course Outcomes

DEPARTMENT OF MATHEMATICS

Program Outcomes

The Mathematics post-graduate program is designed to accomplish the following outcomes:

PO-1 Develop into qualitative scientific human resource by learning the comprehensive curriculum

PO-2 Enhance mathematical skills and understand the fundamental concepts of pure and applied mathematics.

PO-3 Provide qualitative education through effective teaching learning processes by introducing projects, participative learning and latest software tools.

PO-4 Inculcate innovative skills, team work, and ethical practices among students so as tomeet societal expectations.

PO-5 Stimulate collaborative learning and application of mathematics to real life situations.

PO-6 To nurture the curiosity for mathematics in students and to prepare them for future research.

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District-Balaghat,Madhya Pradesh

Programme Specific Outcomes

On completion of M.Sc. (Mathematics) students will be able to:

PSO-1 Understand and analyze the higher notions of Mathematics to develop logical and creative thinking.

PSO-2 Investigate and apply mathematical tools to find solutions &to develop mathematical models to solve real world problem in an efficient way.

PSO-3 Develop a deep level of understanding in Mathematics, providing a strong foundation to identify the thrust areas in research.

PSO-4 Comprehend high levels of abstraction in pure and applied mathematical concepts.

PSO-5 Acquire and understand the subject knowledge and problem solving skills to qualify various job oriented exams/CSIR-NET/SET exams/Ph.D. entrance tests.

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M.Sc. I Semester

Paper: I (Real Analysis)	
S. No.	**Course Outcomes**
CO-1	Apply the concept of Riemann - stieltjes integral and its Properties.
CO-2	Learn the basic concepts of Integration of Vector valued curve, rearrangement of terms of a series, Riemann's Theorem.
CO-3	Apply the concepts of convergence and uniform convergence, Weierstrass M test.
CO-4	Understand the idea of differentiation in R^n and its properties like chain rule etc.
CO-5	Learn the Implicit function theorems, Lagrange's Multiplier Method etc. and apply them to solve the problems.

Paper: II (Topology-I)	
S. No.	**Course Outcomes**
CO-1	Understand the concept of Axioms of choice. Also apply Schroeder-Bernstein and Zorn's lemma to solve problem
CO-2	Acquire basic knowledge of topological spaces and base for topology
CO-3	Illustrate the concept of Kuratowski closure operator and neighboring system
CO-4	Explain the first and second countable spaces. Also analyze and demonstrate countability and separability
CO-5	Learn the theorems on connected spaces and use them to solve the problem

Paper: III (Complex Analysis-I)	
S. No.	**Course Outcomes**
CO-1	To develop comprehensive understanding as well as problem solving skills.
CO-2	To understand and learn the basic concepts of complex integration, line integrations.
CO-3	To evaluate various 'difficult looking integrals' using the techniques of Residue Calculus and its applications.
CO-4	To understand and learn the concepts of different types of singularities, Bilinear Transformations and Branches of many values functions.
CO-5	To apply the techniques learned in this course to the advanced courses of Complex

	Analysis, Research and in other subjects i.e. Physics, Engineering etc.
Paper: IV (Advanced Abstract Algebra)	
S. No.	**Course Outcomes**
CO-1	Understand the concept of counting principle, class equation, Cauchy's theorem. Also classify Sylow's theorems to identify the whole structure of finite group
CO-2	Acquire knowledge of fundamental notions from series of group. Also prove Zassenhaus, Schreir refinement and Jordan Holder theorems
CO-3	Define the concept of Solvable group, Commutator subgroup, Nilpotent group and their properties
CO-4	Explain the fundamental concepts of field extension, splitting field and their role in the context of abstract algebra
CO-5	Illustrate the perfect field, finite field and recognize the difference between separable and inseparable extension
Paper: V (Functional Analysis-I)	
S. No.	**Course Outcomes**
CO-1	Apply the concept of Metric Space, Topology metric Space Examples and Question.
CO-2	Apply the basic Concept of continuous mapping, Continuous function with Examples and problems.
CO-3	Apply the Concept of norm and normed linear space, Examples Question, properties.
CO-4	Basic concept of continuous linear transformation on normed linear space, norm transformations and theorem, Examples.
CO-5	The basic of open mapping theorem and inner product space with examples and problems.

M.Sc. II Semester	
Paper: I (Advanced Abstract Algebra)	
S. No.	**Course Outcomes**
CO-1	Understand the concept of Galois group of a polynomial and learn the Insolvability by radicals.
CO-2	Illustrate various properties of modules and explain finitely generated & cyclic modules.

CO-3	Understand simple modules, semi-simple modules, free modules, rank of a module.
CO-4	Develop the understanding of special kind of modules i.e. Noetherian & Artinian Modules and their various properties.
CO-5	Recognize the importance of Fundamental Structure Theorem over a PID and its further application.

Paper: II (Lebesgue Measure & Integration)

S. No.	Course Outcomes
CO-1	Understand the concept of Measure, Lebesgue Measure, Outer Measure, Borel Measure and Non-measurability.
CO-2	Understand the key idea of integration. Learn Riemann & Lebesgue Integration in general. Perform integration of series of function.
CO-3	Define the concept of derivative of a function, Function of bounded variation, Learn Lebesgue Differentiation Theorem, Relation between integration & Differentiation.
CO-4	Explain the fundamental concepts of L^p spaces and its properties.
CO-5	Illustrate the various kinds of convergences.

Paper: III (Topology)

S. No.	Course Outcomes
CO-1	Apply the concept of Separation axioms T0,T1,T2,T3,T4:their characterizations and basic Properties.
CO-2	Apply the basic Concept of Compactness,.
CO-3	Apply the Concept of Tychonoff product topology.
CO-4	Basic concept of embedding and metrization Imbedding lemma.
CO-5	The basic concept of net and filter topology and convergence of nets, Hausdorff spaces and nets.

Paper: IV (Complex Analysis)

S. No.	Course Outcomes
CO-1	Understand the Weierstrass factorization theorem Gamm and Riemann function and its property.
CO-2	Understand the Runge's Mittag – Leffer's theorem and power series method and its property.

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CO-3	Understand the Schwartz reflection principal Monodromy theorem and Harmonic function on a disc.
CO-4	Understand the basis principal of Harnax inequality, Dirichlet problem and Borels theorem and its property.
CO-5	Understand Bloch's theorem, Little Picard and Schottky's theorem and its property.

Paper: V (Advanced Discrete Mathematics)

S. No.	Course Outcomes
CO-1	Apply the concept of Idea of Direct graph, in degree and out degree of a vertex.
CO-2	Apply the basic Concept of Introductory Computability theory, finite state machines and their transition table Diagram.
CO-3	Apply the Concept of Non-deterministic finite Automata and equivalence of its power to that of Deterministic finite Automata.
CO-4	Basic concept of turning machine and partial Recursive function. Grammars and Languages.
CO-5	The basic concept of sentential forms Language generated by grimmer.

M.Sc. III Semester

Paper: I (Functional Analysis)

S. No.	Course Outcomes
CO-1	Learn the basic concept of various types of continuities, Baire's Category Theorem
CO-2	Understand various properties of Normed space and continuous linear transformations.
CO-3	Understand the application of Hahn-Banach Theorem, Open Mapping Theorem, Closed Graph Theorem
CO-4	Learn the concept of conjugate of an operator, Uniform boundedness principal and its applications, Definition and various properties of Hilbert Spaces
CO-5	Understand and explain Orthonormal sets, Graham Schmidt Orthonormalization Process, Riesz representation Theorem.

Paper: II (Partial Differential Equations)

S. No.	Course Outcomes

CO-1	Understand the Transport Equation-Initial Value Problem, Non-Homogeneous Equation, Laplace's Transformation and its Fundamental solution
CO-2	Learn Mean Value Formula, Properties of Harmonic Functions, Green's Function and Energy Methods for Solving PDEs.
CO-3	Learn the idea of Heat Equation and its fundamental solution.
CO-4	Understand Mean Value Formula for Heat Equation, Properties of Solutions, Energy Methods.
CO-5	Explain and understand Wave Equation-Solution by Spherical Means, Non-Homogeneous Equation, Energy Methods

Paper: III (Advanced Graph Theory-I)

S. No.	Course Outcomes
CO-1	Use the basic concept of graph theory to solve the round table and travelling salesman problems
CO-2	Acquire broad understanding of Euler's and Hamiltonian graph
CO-3	Deep knowledge in types of trees and their properties
CO-4	Apply algorithm for finding shortest tree in weighted graph
CO-5	Calculate rank and nullity of a given graph. Understand the concept of fundamental cut sets and cut vertices

Paper: IV (Integral Transform-I)

S. No.	Course Outcomes
CO-1	Understand the basic concept of Laplace transform and its application in solution of initial and boundary value problem.
CO-2	Understand the basis concept of Two- and Three-dimensional Laplace Transform.
CO-3	Understand the basis concept of Wave Equation and its solution by variation of parameter.
CO-4	Demonstrate the basic principles of Integral Equation and its solution.
CO-5	Understand the basis concept Heat equation and its solution.

Paper: V (Operation Research)

S. No.	Course Outcomes
CO-1	Understand the Origin of Operational Research and its Property.

CO-2	Understand the different models in Operational Research.
CO-3	Understand the basis concept of Solution of Linear Programming Problem by Graphical Method
CO-4	Understand the basis concept of solution of Linear Programming Problem by Big M method.
CO-5	Understand the basis concept of Duality and its importance.

M.Sc. IV Semester	
Paper: I (Operational Research-II)	
S. No.	**Course Outcomes**
CO-1	Understand the Origin of Operational Research and its Property.
CO-2	Understand the different models in Operational Research.
CO-3	Understand the basis concept of Solution of Linear Programming Problem by Graphical Method
CO-4	Understand the basis concept of solution of Linear Programming Problem by Big M method.
CO-5	Understand the basis concept of Duality and its importance.
Paper: II (Applied Functional Analysis)	
S. No.	**Course Outcomes**
CO-1	Understand the advanced level properties on Hilbert Spaces
CO-2	Develop an critical thinking weak convergence, weak compactness properties etc.
CO-3	Learn some advanced ideas and results developed on convex sets.
CO-4	Explain Linear Operator, Various Types and their properties.
CO-5	Learn the spectral theory of operators.
Paper: III (Spline Theory)	
S. No.	**Course Outcomes**
CO-1	Learn various kinds of polynomial interpolation.
CO-2	Explain Piecewise Linear Approximation and its properties.
CO-3	Understand Piecewise cubic interpolation and various concepts related to it.
CO-4	Develop a thinking of the idea of Parabolic spline interpolation.

CO-5	Understand the space P^{ν} and the truncated power series.

Paper: IV (Advanced Graph Theory-II)

S. No.	Course Outcomes
CO-1	Illustrate the concepts of Connectivity and separability in graphs, Kuratowski two graphs embedding and regions of planar graphs, Detection of Planarity.
CO-2	Explain the idea behind Geometric Dual and Combination Dual.
CO-3	Make a clear intuition for Coloring and Covering of graphs and related important theorems.
CO-4	Learn the concept of Digraph and types of Digraphs.
CO-5	Understand the Adjacency matrix, Apply Kruskal Algorithm and Dijkstra Algorithm.

Paper: V (Integral Transform-II)

S. No.	Course Outcomes
CO-1	Apply the Laplace Transform to solve the boundary value problems.
CO-2	Understand the application of Integral transform Techniques in Physics.
CO-3	Learn complex Fourier Series Inversion Formula, Fourier Cosine and Sine Formulae
CO-4	Understand the properties of Fourier Transform, Convolution, &Parseval's Identity
CO-5	Illustrate the concept of Fourier Transforms of the derivatives, Finite Fourier Sine and Cosine Transform, Inversion Operational.

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Economics - Syllabus of Theory Paper

Part A Introduction

Program: Diploma	Class: B.A. II year	Session:2022-23

Subject: Economics

1	Course Code	A2-ECON1T
2	Course Title	MACRO ECONOMICS (Paper 1)
3	Course Type Major / Minor/Elective/ Generic Elective/Vocational/.....)	MAJOR-1
4	Pre-requisite (if any)	Certificate course with Economics as Major subject
5	Course Learning outcomes (CLO)	After completing this course, students will be able to explain the difference between macroeconomics and microeconomics, common macroeconomic variables, national income and determination of output and employment in classical and Keynesian approaches. They will be able to understand the consumption and investment function of an economy and to derive IS-LM curves and use the framework to explain the working of an economy. Students will also be able to explain the concept, measurement and effects of inflation, deflation and the various theories of trade cycle.
6	Credit Value	6 + 0=06
7	Total Marks	Max. Marks: 30+70 / Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week) L-T-P: 03 hours

Unit	Topics	No. of Lectures
I	Concept of Macroeconomics: 1. Definition of Macroeconomics, Subject Matter, Importance and Limitations 2. Interrelationship between Microeconomics and Macroeconomics 3. Macroeconomic Variables- Stock and Flow 4. Circular Flow of Income 5. Definition and Different Concepts of National Income 6. Methods of Measuring National Income 7. Social Accounting of National Income 8. National Income and Economic Welfare 9. Ancient Indian Concept of income, debt and charity.(Market failure and Charity) -Rig Ved 117 Hyn. - Bhishm Parv of Mahabharat (Book/Vol-VI)	18

Part A Introduction			
Program: Diploma		Class: B A. II Year	Session:2022-23
Subject: Economics			
1	Course Code	A2-ECON2T	
2	Course Title	MONEY, BANKING AND PUBLIC FINANCE (Paper 2)	
3	Course Type Major / Minor/Elective/Generic Elective/Vocational/.....)	Major-2/Minor/Elective	
4	Pre-requisite (if any)	Certificate Course with Economics as Major/Minor/Elective subject	
5	Course Learning outcomes (CLO)	Students successfully completing this course will have the ability to • Explain the quantity theory of money, determinants of money supply, the process of credit creation, credit control and other functions of commercial banks and central bank. • Understand the issues like the role of the state, provision of public goods, optimal design of tax and economic policies. • Describe the role of public expenditure and effects of taxation and and public debt in developing country.	
6	Credit Value	06	
7	Total Marks	Max. Marks: 30+70	Min. Passing Marks: 33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week): **L-T-P:** 03 hours

Unit	Topics	No. of Lectures
I	Money: 1. Money - Defination, Functions and Classification 2. Importance of Money 3. Value of Money and Quantitative Theory of Money – Cash Transaction Approach, Cash Balance Approach and Keynesian Approach 4. Quantitative Theory of Milton Freidman 5. Main Components of Money Supply, High Powered Money, Concept of Money Multiplier, Factors Affecting Money Supply, Plastic Money	18
II	Banking: 1. Bank- Defination and Types 2. Functions of Commercial Banks 3. Process of Credit Creation by Commercial Banks 4. Introduction of Internet Banking and Retail Banking 5. Meaning and Importance of Central Bank 6. Functions of Central Bank 7. Credit Control by Central Bank- Quantitative and Qualitative Methods	18

Syllabus of Theory Paper

Program: Certificate	Part A Introduction	Class: B.A. I year	Year: 2021 (I' y-1)	Session:2021-22
1	Course Code	Subject: Economics		
2	Course Title	A1-ECONIT		
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	MICRO ECONOMICS (Paper I) CORE COURSE		
4	Pre-requisite (if any)	12th Pass in Any Discipline		
5	Course Learning outcomes (CLO)	After completing this course, students will be able to understand rational behaviour and fundamentals of microeconomics. They will be able to explain consumer's and producer's behaviour and their optimum decisions. Students will be able to know about the firms and industry, markets and their decisions about optimum production. They will be also able to explain the theory of distribution and concept of economic welfare. Learning microeconomics is an excellent way to gain an understanding of many factors that affect us in the real-world, such as methods of buying goods, product pricing and input pricing. Ultimately, learning microeconomics is key in learning about the principles of economics.		
6	Credit Value	06		
7	Total Marks	Max. Marks: 25+75		Min. Passing Marks:33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week):03 hours
L-T-P:

Unit	Topics	No. of Lectures
I. Introduction of Economics	1. Definition, Scope and Nature of Economics 2. Relation of Economics with other Social Science Subjects 3. Positive and Normative Economics 4. Methods of Economic Analysis -Inductive and Deductive methods. 5. Basic Concepts – Commodity, Price, Value, Rational Behaviour, Economic Laws, Wants and Choices 6. Central Problems of An Economy -Production Possibility Curve	18

Economics - Syllabus of Theory Paper

Part A Introduction			
Program: Certificate	Class: B.A. I Year	Year: 2021	Session:2021-22
Subject: Economics			

1	Course Code	A1-ECONT2T
2	Course Title	INDIAN ECONOMY(Paper 2)
3	Course Type (Core Course/Elective/Generic Elective/Vocational/.....)	CORE COURSE
4	Pre-requisite (if any)	12 th Pass in Any Discipline
5	Course Learning outcomes (CLO)	After completing this course, students will be able to sharpen the analytical skills by highlighting on broad overview of the Indian economy. They will be familiar with the issues related to Agriculture, Industry, Foreign Trade, Economic Planning and various Economic Problems of India. Students will be acquainted with broad overview of Madhya Pradesh Economy. They will be able to develop, analyse and interpret events and issues related to Indian Economy.
6	Credit Value	06
7	Total Marks	Max. Marks: 25+75 / Min. Passing Marks: 33

Part B- Content of the Course

Total No. of Lectures-Tutorials-Practical (in hours per week): 03 hours

L-T-P:

Unit	Topics	No. of Lectures
I Introduction	1. Characteristics of Indian Economy 2. Trends and Sectoral Composition of National Income (16) 3. Sectoral Distribution of Workforce (15) 4. Natural Resource Endowments- Land, Water, Livestock, Forest and Minerals 5. Demographic Features - Population Composition, Size and Growth Rates 6. Problems and Causes of Over-Population and Population Policy	18
II Agriculture	1. Nature, Importance and Characteristics of Indian Agriculture	

भाग अ- परिचय			
कार्यक्रम: प्रमाण पत्र	कक्षा `:बी.कॉम	वर्ष::प्रथम वर्ष	सत्र:2021-22
विषय:वित्तीय लेखांकन			

1	पाठ्यक्रम का कोड	C1-COMA1T	
2	पाठ्यक्रम का शीर्षक	वित्तीय लेखांकन (प्रश्न पत्र)	
3	पाठ्यक्रम का प्रकार	कोर	
4	पूर्वापेक्षा (यदि कोई हो)	सभी के लिए उपलब्ध **(Open For all)**	
5	पाठ्यक्रम अध्ययन की परिलब्धियां (कोर्स लर्निंग आउटकम)**(CLO)**	इस पाठ्यक्रम को सफलतापूर्वक पूरा करने पर, छात्र निम्न में सक्षम होगा: • लेखांकन की मूल बातों का वैचारिक ज्ञान प्राप्त करना • उन घटनाओं की पहचान करें जिन्हें लेखांकन रिकॉर्ड में दर्ज करने की आवश्यकता है • GAAP के अनुसार वित्तीय लेनदेन रिकॉर्ड करने और रिपोर्ट तैयार करने का कौशल विकसित करना • लेखांकन जानकारी की भूमिका और इसकी सीमाओं का वर्णन करें • एकमात्र व्यापारी के लेखा प्रक्रिया और अंतिम खातों की तैयारी के ज्ञान से लैस • रोकड़ बही और पासबुक शेष के बीच अंतर के कारणों को पहचानें और उनका विश्लेषण करें • त्रुटियों और धोखाधड़ी के बढ़ते जोखिम के लिए प्रदान करने वाली परिस्थितियों को पहचानें	
6	क्रेडिट मान	6	
7	कुल अंक	अधिकतम अंक: 25+75	न्यूनतम उत्तीर्ण अंक:33

Programme : Certificate Class:B.COM.1st Year		Session 2021-22
Subject: **Commerce**		
	CourseCode	C1-COMA1T
2	Course Title	**Financial Accounting**
3	Course Type	Core
4	Pre-requisite	Not requiredopen for all
5	Course Learning Outcomes	**Successful completion of this course, the student will be able to:** • Acquire conceptual knowledge of basics of accounting • Identify events that need to be recorded in the accounting records • Developtheskillofrecordingfinancialtransactionsandpreparationofreports in accordance with GAAP • Describe the role of accounting information and itslimitations • Equip with the knowledge of accounting process and preparation off in a accounts of sole trader • Identify and analyze the reasons for the difference between cash book and pass book balances • Recognize circumstances providing for increased exposure to errors and frauds
6	Credit Value	6
7	Total Marks	Max marks : 25+75 Minimum Passing Marks 33

भाग अ- परिचय				
कार्यक्रम: प्रमाण पत्र		कक्षा :बी.कॉम.	वर्ष::प्रथम वर्ष	सत्र:2021-22
विषय:व्यावसायिक नियमन रुपरेखा				
1	पाठ्यक्रम का कोड	C1 COMA 2T		
2	पाठ्यक्रम का शीर्षक	व्यावसायिक नियमन रुपरेखा समूह2(प्रश्न पत्र 2)		
3	पाठ्यक्रम का प्रकार :(कोर.)	कोर		
4	पूर्वापेक्षा (यदि कोई हो)	सभी के लिए उपलब्ध (Open For all)		
5	पाठ्यक्रम अध्धयन की परिलब्धियां (कोर्स लर्निंग आउटकम)(CLO)	.इस पाठ्यक्रम के अध्ययन से छात्र- छात्राएं : सामान्य व्यापार कानून के मुद्दे के व्यावहारिक कानूनी ज्ञान प्राप्त करेंगे. एक वैध अनुबंध की अनिवार्यता को समझेंगे, माल की बिक्री और एक बिक्री अनुबंध और उपचारात्मक उपायों के प्रदर्शन के संबंध में विभिन्न कानूनों की समझ प्राप्त होगी, भारत में उपभोक्ता संरक्षण के लिए विभिन्न कानून के साथ विभिन्न उपभोक्ता मंचों के कार्यसेछात्रों को परिचित होंगे तथा साइबर कानूनों के संबंध में अर्थ और विभिन्न विधानों का भी उन्हें ज्ञान होगा..		
6	क्रेडिट मान	6		
7	कुल अंक	अधिकतम अंक: 25+75		न्यूनतम उत्तीर्ण अंक:33
भाग ब- पाठ्यक्रम की विषयवस्तु				

Programme : Certificate Class:B.COM.1st Year session 2021-22		
Subject: COMMERCE (Business regulatory Framework)		
1	CourseCode	C1 COMA 2T
2	Course Title	Business regulatory Framework (PAPER 2)
3	Course Type	Core
4	Pre-requisite	Not required (open for all)
5	Course Learning Outcomes	The outcome of this course is to provide the students with practical legal knowledge of general business law issues. To Understand the Essentials of A Valid Contract, The Laws Of The Act, Consideration And The Various Modes Of Discharge Of A Contract To Explain the Various Laws with Regard to The Sale of Goods and Performance of a Sale Contract and Remedial Measures,to Familiarize the Students with The Various Law with Regard to Consumer Protection in India And the Functions of Various Consumer Forumsand,to Understand the Meaning and The Various Legislations with Regard to The Cyber Laws
6	Credit Value	6
7	Total Marks	Max marks : 25+75 Minimum Passing Marks 33

भाग अ- परिचय				
कार्यक्रम: डिग्री		कक्षा :बी.कॉम	वर्ष: प्रथम	सत्र: 2021-22
विषय:वाणिज्य				
1	पाठ्यक्रम का कोड	C1- COMA 2T		
2	पाठ्यक्रम का शीर्षक	व्यवसायिक संगठन एवं संचार		
3	पाठ्यक्रम का प्रकार :(कोर कोर्स/इलेक्टिव/जेनेरिक इलेक्टिव/वोकेशनल/.....)	गौण		
4	पूवपिक्षा (Prerequisite) (यदि कोई हो)	सभी के लिए उपलब्ध (Open For all)		
5	पाठ्यक्रम अध्धयन की परिलब्धियां (कोर्सलर्निंग आउटकम)(CLO)	इस पाठ्यक्रम के पूरा होने के बाद यह उम्मीद की जाती है कि छात्र व्यवसाय की मूल बातें समझ जाएगा और यह समझने में सक्षम होगा कि किसी भी व्यवसाय को सफलतापूर्वक कैसे व्यवस्थित किया जा सकता है। संचार से संबंधित अध्याय यह स्पष्ट करने में सक्षम होंगे कि आधुनिक व्यावसायिक परिदृश्य में संचार कैसे महत्वपूर्ण भूमिका निभाता है।		
6	क्रेडिट मान	6		
7	कुल अंक	अधिकतम अंक: 25+75		न्यूनतम उत्तीर्ण अंक:33
भाग ब- पाठ्यक्रम की विषयवस्तु				

Part A Introduction			
Program: Degree	**Class: B.COM**	**Year: I Year**	**Session:2021-2022**
Subject: Commerce			

1	**Course Code**	**C1- COMA 2T**	
2	**Course Title**	BUSINESS ORGANIZATION AND COMMUNICATION	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational/.....)**	Minor	
4	**Pre-requisite (if any)**	Not required) open for all	
5	**Course Learning outcomes (CLO)**	After completion of this course it is expected that the student shall understand the basics of the business and will able to imbibe how any business can be organized successfully. The chapters related communication shall be able to elucidate how communication plays an important role in modern business scenario.	
6	**Credit Value**	6	
7	**Total Marks**	Max. Marks: 25+75	Min. Passing Marks:33

Part B- Content of the Course

भाग अ- परिचय				
कार्यक्रम: प्रमाण पत्र		कक्षा :बीकॉम	वर्ष::प्रथम वर्ष	सत्र:2021-22
विषय: वाणिज्य -व्यावसायिक अर्थशास्त्र				
1	पाठ्यक्रम का कोड	C1-COMC1T		
2	पाठ्यक्रम का शीर्षक	व्यावसायिक अर्थशास्त्र		
3	पाठ्यक्रम का प्रकार	इलेक्टिव		
4	पूर्वापेक्षा (यदि कोई हो)	सभी के लिए उपलब्ध **(Open For all)**		
5	पाठ्यक्रम अध्धयन की परिलब्धियां (कोर्स लर्निंग आउटकम)**(CLO)**	व्यावसायिक अर्थशास्त्र के अध्ययन से विद्यार्थीगण • आर्थिक गतिविधियों के फलस्वरूप बाज़ार में वस्तुओं की कीमतों में उतार चढ़ाव से परिचितहोंगे, • मांग पूर्ति के सिद्धांत से कीमते एकाएक कम या अधिक क्यों हो जाते है ये ज्ञान प्राप्त कर सकेंगे • उत्पत्ति के समस्त साधनों का ज्ञान प्राप्त कर सकेंगे • जो उन्हें एक अच्छा उद्यमी बनानेपूर्ण प्रतियोगिता,एकाधिकार और अपूर्ण प्रतियोगिता के ज्ञान के साथ इन स्थितियों में कीमत कैसे निर्धारित होती है ये भी जान सकेंगे।		
6	क्रेडिट मान	6		
7	कुल अंक	अधिकतम अंक: 25+75		न्यूनतम उत्तीर्ण अंक:33

Programme : Certificate Class:B.COM. I[st] Year session 2021-22		
Subject:	Commerce	
1	CourseCode	C1-COMC1T
2	Course Title	Business Economics
3	Course Type	General Elective
4	Pre-requisite	Not requiredopen for all
5	Course Learning Outcomes	Upon successful completion of the course a student will be able to 1. Understand how households (demand) and businesses (supply) interact in various market structures to determine price and quantity of a goodproduced. 2. Understand the links between household behavior and the economic models ofdemand. 3. Represent demand, in graphical form, including the downward slope of the demand curve and what shifts the demandcurve. 4. Understand the links between production costs and the economic models ofsupply. 5. Understand the concept of Pricing 6. Analyze operations of markets under varying competitiveconditions
6	Credit Value	6
7	Total Marks	Max marks : 25+75 Minimum Passing Marks 33

भाग ए परिचय		
कार्यक्रम: प्रमाण पत्र	वर्ष: प्रथम वर्ष	सत्र : 2021 - 22

पाठ्यक्रम क्रमांक	V1-COM-DIGT
पाठ्यक्रम शीर्ष	डिजिटल मार्केटिंग
पाठ्यक्रम का प्रकार	व्यवसायिक
पूर्व आवश्यकता	सभी संकाय के विद्यायार्थियों के लिए उपलब्ध
पाठ्यक्रम सीखने के परिणाम (सीएलओ)	पाठ्यक्रम के सफल समापन के बाद, छात्र निम्नलिखित में सक्षम होगा: • डिजिटल मार्केटिंग , उसका महत्व, वेब साइट का अर्थ और वेब साइट के स्तर, ब्लॉग, पोर्टल और वेबसाइट के बीच अंतर. • पेज ऑप्टिमाइजेशन, ऑफ पेज ऑप्टिमाइजेशन पर SEO (सर्च इंजन ऑप्टिमाइजेशन) की कार्यप्रणाली की समझ और रिपोर्ट तैयार करना • फेसबुक, ट्विटर, लिंकडइन, टम्बलर, पिंटरेस्ट और अन्य सोशल मीडिया सेवाओं के अनुकूलन जैसे एसएमओ (सोशल मीडिया ऑप्टिमाइजेशन) के बारे में ज्ञान • भुगतान किए गए टूल जैसे Google विज्ञापन शब्द, प्रदर्शन विज्ञापन तकनीक • वेबसाइट ट्रैफ़िक, कीवर्ड विश्लेषण और ईमेल मार्केटिंग और विज्ञापन डिज़ाइनिंग सीखने के लिए SEO के लिए उपयोगी टूल पर व्यावहारिक अनुभव।
अपेक्षित नौकरी की भूमिका कैरियर के अवसर	• डिजिटल मार्केटिंग मैनेजर • खोज इंजन अनुकूलक • सोशल मीडिया मार्केटर • सामग्री विपणक • एआर-वीआर के लिए सामग्री निर्माता • आवाज सहायता के लिए एसईओ विशेषज्ञ
क्रेडिट मूल्य	4

Part A Introduction		
Program: Certificate	**Year: First Year**	**Session: 2021-2022**
Course Code	**V1-COM-DIGT**	
Course Title	**DIGITAL MARKETING**	
Course Type	**Vocational**	
Pre-requisite (if any)	Open for All	
Course Learning outcomes (CLO)	**After the successful completion of the course, the student shall be able to-:** • Understand digital marketing, importance thereof, meaning of web site and levels of web site, difference between blog, portal & website. • Understand the working of SEO (search engine optimization) on page optimization, off page optimization, and will learn to prepare reports • Learn about SMO (social media optimization) like Face book, twitter, LinkedIn, Tumblr, Pinterest and other social media services optimization • Understand paid tools like Google ad words, display advertising techniques • Learn and apply hands on experience on tools useful to SEO for analysis on website traffic, keyword analysis and learn email marketing and ad designing.	
Expected Job Role / career opportunities	• Digital Marketing Manager • Search Engine Optimizer • Social Media Marketer • Content Marketer • Content creator for AR-VR (Augmented Reality –Virtual Reality) • SEO Specialist for voice assistance	
Credit Value	**4**	

भाग अ - परिचय		
कार्यक्रम: प्रमाण पत्र	वर्ष: प्रथमवर्ष	सत्र:2021-22

पाठ्यक्रम का कोड	**VI-COM-FINT**
पाठ्यक्रम का शीर्षक	वित्तीय सेवाएं और बीमा
पाठ्यक्रम का प्रकार :	व्यावसायिक
पूर्वापेक्षा (Prerequisite) (यदि कोई हो)	सभी संकाय के विद्यार्थियों हेतु
पाठ्यक्रम अध्ययन की परिलब्धियां (कोर्स लर्निंग आउटकम)(**CLO**)	इस पाठ्यक्रम का अध्ययन करने के बाद छात्र सक्षम हो सकेंगे; (1) बैंकिंग और बीमा सेवाओं के कार्यों को समझने में (2) विभिन्न वित्तीय सेवाओं जैसे बैंकिंग, निवेश सलाहकार, धन प्रबंधन, म्यूचुअल फंड, बीमा परामर्श, स्टॉक मार्केट, पूंजी पुनर्गठन, पोर्टफोलियो प्रबंधन आदि को समझने में (3) बैंकिंग और बीमा के कानूनी और नियामक पहलुओं के बारे में ज्ञान बढ़गा (4) वित्तीय डेरिवेटिव के बारे में जागरूक होंगे (5) वित्तीय एवं बीमा सेवाओं के क्षेत्र में कार्य करने हेतु आवश्यक कौशल विकास में
अपेक्षित रोजगार / करियर के अवसर	वित्तीय सलाहकार
क्रेडिट मान	4

Part A Introduction		
Program: Certificate	**Year: First Year**	**Session:2021-22**

Course Code	**V1-COM-FINT**
Course Title	**FINANCIAL SERVICES AND INSURANCE**
Course Type	**Vocational**
Pre-requisite (if any)	**Open for All**
Course Learning outcomes (CLO)	**After studying this Course, the Student will be able to;** 1. Understand the functions of Banking and Insurance services. 2. Know about and able to perform various financial services such as Banking, Investment Advisory, Wealth Management, Mutual Funds, Insurance Consultancy, Stock Market, Capital Restructuring, Portfolio Management etc. 3. Enhances knowledge about the legal and regulatory aspects of Banking & Insurance. 4. Aware about the financial derivatives. 5. Develop skills to work in financial and insurance services.
Expected Job Role / career opportunities	**Financial Consultant**
Credit Value	**4**