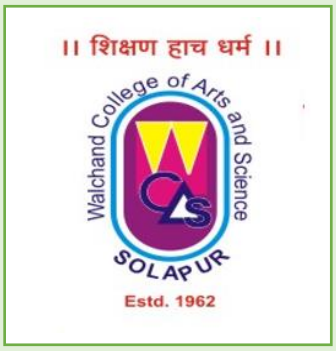

Shri A.P.D. Jain Pathashala's

Walchand College of Arts and Science (Autonomous)

Walchand Hirachand Marg,
Ashok Chowk
Solapur – 413006
Maharashtra

Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs)

INDEX

WALCHAND COLLEGE OF ARTS AND SCIENCE, SOLAPUR

CRITERIA 2.6.1

Program Outcomes, Program Specific Outcomes and Course Outcomes for all programs offered by the institution are stated and displayed in website of the Institution

DEPARTMENT OF ECONOMICS

Sr. No.	Name of the Program	Program outcome
1.	**B.A. Economics**	1. To expose the students to the basic principles of Micro and Macro Economic Theory and also to introduce basics of Research Methodology. 2. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to the market. 3. This course aims to introduce the students to the basic concepts of Economics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, GDP, money, inflation, and the balance of payments. 4. This course looks at the behavior of the consumer and the producer and also covers the behavior of a firm. 5. It introduces the students to various issues related to an Agricultural Economics.
Sr. No.	**Name of the Program**	**Course Outcome**
2.	**B.A. Economics**	• Students get well-founded education in Economics. • Structured curricula will support the academic development of students. • Enable graduates for employment and further study as economists. • Students get an opportunity to pursue courses that emphasize quantitative and theoretical aspects of Economics. • Students get an opportunity to focus on applied and policy issues in Economics. • Programmers allow the students to choose from a wide range of economic specialization. • Students get facilitate with well-resourced learning environment for Economics.

Program Specific Outcome		
	<u>BA Part 1: Semester 1&2</u> **Paper No. 1 Indian Economy-1**	1. Students get familiar with broad features of Indian economy 2. Students can understand the problems of excess population, poverty and unemployment 3. Students learnt the problem of rising prices and its causes, effects and remedies 4. Students get familiar with the role and importance of agriculture in Indian economy
	Paper No.2 Indian Economy-2	1. Students learn about the industrial sector in India 2. Students get familiar with the process of planning in India & growth models 3. Students learn about economy of Maharashtra & the salient features of Maharashtra economy 4. Students get familiar with coop. movement in Maharashtra
	<u>BA Part-2:Semester 3&4</u> **Paper No. 3 Money Banking & Public Finance -1**	1. Students get familiar with Barter system , evolution of money and the functions of money 2. Students understands the process of determination of value of money, inflation and deflation 3. Students get familiar with the commercial banking and modern techniques of banking 4. Students get familiar with RBI
	Paper No. 4 Demography-1	3. Students learn population studies. Students get familiar with demography. 4. Students get familiar with census and demographic surveys. 5. Students understand theories of population. 6. Students get familiar with techniques of data analysis
	Paper No. 5 Money Banking & Public Finance -2	1. Students get familiar with public finance and scope, nature and principles of public finance 2. Students learn about public expenditure 3. Students learn about taxation 4. Students learnt about public debt and financial administration
	Paper No. 6 Demography-2	1. Students get familiar with population in India. 2. Students learn about migration in India. 3. Students get familiar with population policy in

		India. 4. Students learn population projection and forecasting technique
	IDS **Cooperation- Semester 3**	1. Students get introduced to cooperation. 2. Students get familiar with features and benefits of cooperation. 3. Students understand cooperative movement in India
	Semester 4	1. Students get familiar with role of national agencies in the development of cooperative movement. 2. Students learn about credit and non credit cooperatives in India. 3. Students get familiar with cooperative movement in Maharashtra
	<u>BA Part3: Semester 5&6</u> **Paper No. 7 Micro Economics -1**	1. Students get introduce to micro economics. 2. Students get introduce to consumer behavior. 3. Students learn theory of production and cost.
	Paper No. 12 Micro Economics -2	1. Students get familiar with market structure and different types of markets. 2. Students learn about factor pricing 3. Students get introduce to welfare economics
	Paper No. 8 Macro Economics -1	1. Students get introduce to macro economics. 2. Students get introduce to national income. 3. Students learn about output and employment. 4. Students get familiar with Demand and Supply of Money
	Paper No. 13 Macro Economics -2	1. Students learn about trade cycles. 2. Students get introduce to Economic growth. 3. Students get familiar with international trade. 4. Students learn about inflation
	Paper No. 9 History of Economic Thoughts-1	1. Students get introduce to early period of classical economics. 2. Students get familiar with the contribution of Adam Smith, David Ricardo, Malthus and J.B. Say. 3. Students get familiar with the economic contribution by Fredric List and Karl Marx. 4. Students get familiar with the economic contribution by Boham Bawark and Carl Menger.

	Paper No. 10 Economics of Development -1	1. Students get introduce to Economic Growth and Development. 2. Students get familiar with the theories of Economic Development. 3. Students learn about the sectoral view of Economic Development. 4. Students understands the role and importance of resources for Economic Development
	Paper No. 11 Economics of Agriculture -1	1. Students get familiar with rural economy of India. 2. Students get information about land reforms in India. 3. Students get familiar with development of Agriculture. 4. Students get information about technological changes in agriculture
	Paper No. 14 History of Economic Thoughts-2	1. Students get familiar with the economic contribution by Alfred Marshall. 2. Students get familiar with the Keynesian Ideas. 3. Students get familiar with the economic contribution by Joseph Schumpeter. 4. Students get familiar with economic contribution by Mahatma Gandhi, Dr. Babasaheb Ambedkar and Amartya Sen.
	Paper No. 15 Research Methodology -2	1. Students get familiar with research methodology 2. Students get introduced to the stages of research 3. Students learn the methods of data collection 4. Students learn report writing
	Paper No. 16 Economics of Agriculture -2	1. Students learn about agricultural finance I India. 2. Students get familiar agricultural marketing. 3. Students learn about agricultural prices Students get familiar with New Economic policy (1991) and Indian agriculture

Dr. S. D. Chavan
Dept. Of Economics

DEPARTMENT ENGLISH

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs thought by you		
Sr.No.	**Name of the program**	**Program outcomes**
1.	BA & BSc	1. The students are enabled into acquiring and further strengthening different language skills- writing and speaking. 2. They are initiated into the aspects of literary types like- poetry, drama and fiction along with criticism. 3. The students acquire the understanding of the minor literary types like- essays, articles, one act plays, etc
Sr.No.	**Name of the program**	**Program specific outcomes**
1.	Literature	1. The students are made aware of the representative writes of England, America and India. 2. They are acquainted with the writers from different literary periods of these nations.
2.	Language	1. The students acquire insights into various aspects of language- Grammar and Phonology. 2. They are enabled into interpreting various aspects of language.
Sr.No.	**Name of the program**	**Course outcomes**
1.	British Literature	1. The students study various writers from England. 2. They acquire a comparative understanding of the writers belonging to different literary periods.
2.	Indian Writing in English	1. The students are made aware of the representative Indian writers in English. 2. They are taught the ways of appreciating the Indian writers in terms of their sensibilities, insights and diction.
3.	Literatures in English	1. The students of English are made aware of various writers whose works have been brought into English language. 2. This helps the students have a comparative approach to the texts.
4.	Structure and Function of Modern English	1. The students are first of all initiated into Morphology and Phonology. 2. Afterwards they are enabled into acquiring an understanding of various levels of Syntax like Phrases, Clauses and Sentences. 3. They are also made conscious of the aspects of Discourse Analysis.

Mr. M. R. Kamble
Department of English

DEPARTMENT OF GEOGRAPHY

Sr.No.	Name of the program	Program outcomes
1.	B.A. Geography	**PO1:** Students understood basic concepts, scientific information related to Geography. **PO2:** Students acquired basic knowledge, processes related with Geography. **PO3:** Students acquired skills in handling Survey instruments (Prismatic Compass, Plain Table, Chain tape).
Sr.No.	**Name of the program**	**Program Specific Outcomes**
2	B.A. - I Geography	**PSO1:** Students understood basics concept of Geography specially related to the Earth. **PSO2**: Students determined the origin of the Earth, their evolution processes and impact on biological factor. **PSO3:** Students identified various types of the rocks. **PSO4:** Students identified Human race, Religious and Language groups.
	B.A. - II Geography	**PSO1:** Studentsintroducedthe different types of resources. **PSO2:** Studentsidentified the types of soil and important crops taken in different soils. **PSO3:** Students developed skills to draw the map of Physiography, river system in India. **PSO4:** Student understood the mechanism of monsoon.
	B.A. - III Geography	**PSO1:** Students acquired the Cartographic and advanced techniques in Geography. **PSO2:** Students understood the urbanization process in India and World. **PSO3:** Students identified the economic activities of man and categorized into various types. **PSO4:** Student understood the concept of Nation, state and changing political map of India.
Sr.No.	**Name of the program**	**Course Outcomes**
3	B.A. - I Geography	**CO1**: Students sensitized about the background of

	Paper I (Geomorphology)	Geography and Geology. **CO2:** Studentsfamiliarized with geomorphological concepts and processes takes place on the earth surface and within the earth crust. **CO3:** Studentsunderstood the types of Endogenic and exogenesis forces.
	B.A. - I Geography Paper II (Human Geography)	**CO4:** Students understood the age and sex composition of population. **CO5:** Students understand types, pattern and function of human settlement. **CO6:** Students identified the spatial distribution of population in the world.
	B.A. - IIGeography Paper III (Human Geography)	**CO7:** Student understood the human life in cold, desert, plateau and mountainous region. **CO8:** Student understood with the dichotomy in between environmental determinism and Possibilism. **CO9:** Students draw various diagrams using the geographical data.
	B.A. - II Geography Paper IV (Physical Geography of India)	**CO10:**Students understood the absolute and Relative location of India. **CO11:** Students understand mechanism of monsoon and its impact on crops. **CO12:** Students understand and describe types, distribution and conservation of forest.
	B.A. - II Geography Paper V (Population Geography)	**CO13:** Studentsunderstand growth of population in world. **CO14:** Students understood factor affecting on population distribution and the concept of under, over and optimum population. **CO15:** Students understood population policies in India.
	B.A. - II Geography Paper VI (Economic and Demographic Geography of India)	**CO16:** Students identified the major cash and food crops in India. **CO17:** Students understood the importance of industries in Indian Economy. **CO18:**Students categorized trade and transport system in India.

	B.A.-III Geography Paper VII (Resource Geography)	**CO19:** Students understood basic concept of Resources. **CO20:**Students differentiated mineralsand power resources. **CO21:** Students understood the spatial distribution of forest and livestock resources in the world.
	B.A.-III Geography Paper VIII (Urban Geography)	**CO22:** Students identify the process and trends of urbanization. **CO23:**Students identified morphology, structure and problems of urban area. **CO24:** Students understood the theory related development of town structure.
	B.A.-III Geography Paper IX (Development of Geography)	**CO25:** Students understood the brief history of geographical idea. **CO26:** Students understood the comparative study between physical vshuman. **CO27:** Students understood the various countries contribution in development of geographical thoughts.
	B.A. – III Geography Paper X (Geography of Economic Activities)	**CO28:** Students understood the types of agriculture. **CO29:**Students identified the modes of transport. **CO30:**Students understood the concept of tourism and region.
	B.A. – III Geography Paper XI (Political Geography)	**CO31:**Students understood the basic concepts related political geography. **CO32:**Students understood global strategic views and their relevance to contemporary world situation. **CO33:** Students understood Geo-political issues of India.
	B.A. – III Geography Paper XII (Applied Geography)	**CO34:**Students understood issues related to physical environment. **CO35:**Students identified various environmental degradation processes. **CO36:**Students understood of issues related to human resources and economy.
	B.A. – III Geography P. Paper I (Element of	**CO37:** Students enabled to use of elements of map work.

	Map Work and Weather Reports) B.A. – III Geography P. Paper II (Cartographic and Advanced Techniques in Geography) B.A. – III Geography P. Paper III (Topographical Maps and Statistical Methods) B.A. – III Geography P. Paper IV (Surveying and Field work)	**CO38:** Students handled the weather instruments and weather charts. **CO39:** Students draw various map scale and projections. **CO40:** Students enable to use various cartographic techniques. **CO41:**Students identified and familiarized GIS techniques. **CO42:** Students use aerial photographs to photo interpretation. **CO43:**Students draw relief features using counters. **CO44:** Students used statistical methods for data interpretation. **CO45:** Students identified relief features from toposheets. **CO46:**Students acquainted with the surveying. **CO47:**Students handled plane table, prismatic compass and chain tape. **CO48:** Students understood about the field work and study tour.

Dr. N.I. Dhayagode
Department of Geography

DEPARTMENT OF GEOLOGY

Program outcomes, program specific outcomes and course outcomes for all programs thought by you		
Sr. No.	**Name of the program**	**Program outcomes**
1	**B.Sc. Geology**	PO1: Students understood basic terminology, concepts, scientific information related with geology PO2: Students acquired basic knowledge, processes related with geology PO3:Students acquired skills in handling petro logical microscopes, drawing geological sections and performing practical.
Sr. No.	**Name of the program**	**Program specific outcomes**
2	**B.Sc. - I Geology** **B.Sc. - II Geology**	PSO1: Students understood basics of dynamic geology, physical geology, Mineralogy& Petrology PSO2: Students determined the earth processes and their impact on human being PSO3: Students identified minerals, rocks and fossils, developed skills to draw sketches and analyze data related with drainage basins PSO4: Students introduced to different topics related with mineralogy, petrology, structural geology PSO5: Students understood the functioning and use of polarizing microscope PSO6: Students developed skills to draw geological problems, sections of geological maps, identify minerals, rocks under microscope
Sr.No.	**Name of the program**	**Course outcomes**
3	**B.Sc. - I Geology Paper I (Mineralogy & Paleontology)** **B.Sc. - I Geology Paper II (Petrology)**	CO1: Students determine about minerals, types, different types of physical properties, chemical bonding CO2: Students understand different types of mineral groups CO3: Students determine about fossils, conditions of fossilization CO4: Students understand modes of preservation and uses of fossils, morphology of hard parts of different fossil groups CO5: Students determine about rocks, types, different types of properties, CO 6: Students understand different types of rock groups CO 7: Students determine about rocks, conditions of rock

		formation CO8: Students understand rock cycle
	B.Sc. - I Geology Paper III (General Geology) **B.Sc. - I Geology Paper IV (Physical Geology)**	CO9: Students understand formation of Universe, Galaxy. Earth origin CO10: Students understand Internal Structure of Earth CO11: Students understand and describe geological work carried by different types Volcanoes, Earthquake CO12: Students determine about formation relief features CO13:Students determine effect of natural agents on & below the earth CO14: Students understand weathering process and different types CO15: Students understand and describe geological work carried by different types of natural agents like wind, river, ocean, glacier etc. CO16: Students determine about formation, types of soil
	B.Sc. - II Geology Paper V (Optics & mineralogy) **B.Sc. - II Geology Paper VI (Structural Geology)**	CO1: Students determine about polarizing microscope, its assembly and use CO2: Students understand different optical properties of minerals, draw sketches CO3: Students determine different mineral groups with their physical, optical properties and occurrence CO4: Students identify minerals under microscope CO5: Students understand plate tectonics movement CO6: Students understand different types of structures CO7: Students determine terminology of structures CO8: Students identify structures from litho log
	B.Sc. - II Geology Paper VII(Igneous petrology)	CO9: Students understand different processes involved in formation of Igneous rocks, classification CO10: Students determine different types of Igneous rocks, environment & types CO11: Students understand differentiation and assimilation CO12: Students determine different types of igneous

	B.Sc. - II Geology Paper VIII (Sedimentary & Metamorphic petrology)	rocks,Tabular classification,Textures CO13: Students understand different processes involved in formation of sedimentary rocks, classification CO14: Students determine different types of sedimentary rocks, environment of deposition & types CO15: Students understand formation of metamorphic rocks, concept of grade and facies of metamorphism CO16: Students determine different types of facies, identify their mineral assemblages, understand concepts of retrograde, poly-metamorphism and process of anatexis

Dr. P. D. Mali
Department of Geology

DEPARTMENT OF HINDI (B.A. & M.A.)

Sr.No.	Name of the program	Program outcomes
1.	B.A.- Hindi	PO1: To enable students to learn different language skills e.g. – Writing & Conversation etc. PO2: Students evable to understand different literature genre e.g. - Drama , Poetry , Criticism etc. PO3: Students understand literature like essays , one act play etc.
.2	M.A. Hindi	PO 4: Students Learn Various language skills- L.S.R.W. PO 5: Students know the concept of Literary research. PO 6: Students know the nature of two languages through the medium of translation.

Sr.No.	Name of the program	Program specific outcomes
	B.A.-I Hindi	PSO1: Create interest in Hindi literature of students. PSO2: Students know about Hindi authers & poets. PSO3: Students increase his imagination power as well as thought he also introduce different words like administration , economics . PSO4: Love for nation and social awareness will increase in the mind of students . PSO5 : Students introduce about gender etc.
3	B.A.-II Hindi	PSO1: Students know about conterporary literature and develop amodern perspective to words the morality and he also introduce with post Hindi storied and modern art. PSO2: Students enable to know spiritual and social , cultural , religious situation side by side spiritual poems and their vice and virtues towords anicient and medieval culture. PSO3: To enable students to make interest in types of novels and to create interest and critical view about it. PSO4: To enable students to understand the background of modern period of chhayavad and pragatiwad according to medium of this nature , awareness, human pain with know about the social and economic condition after independence.
	B.A.-III Hindi	PSO1: Students try to learn micro learning of Hindi literature the writer and their place and thoughts. PSO2: Students enable to understand about the creation of Hindi literature its principles , values , virtues and figure of speeches . PSO3: Students understands the different types of literature of ancient , medieval and modern side by side he also acquaintance with different development of learning and various authors work as well as isms.

		POS4 *:* Students posses the knowledge about language , purity of language , students of grammar , introduction of language and also increased scientific view to wards language and know about pronounciation, meaning etc. POS 5 : Students understand the official correspondence and different skills , according to this he acquaintaned with advertisement , Translation and modern , Mass communication mediums.

4.	M.A.-I	PSO 1: Students Learn Various language skills- L.S.R.W. PSO 2: Students know the concept of Literary research. PSO 3: Students know the nature of two languages through the medium of translation. PSO 4: Students interest of literature among students.

5.	M.A.-II	PSO 5: Students take interest in Hindi literature . PSO 6: Students learn the stages of development of prose PSO 7: Students get introduced to various writers in Hindi literature .
Sr.No.	Name of the program	Course outcomes
3	B.A.-I Hindi **(Sahitya surbhi)**	CO1: Students know Hindi authors & poets. . CO2: Students introduced different words like administrative , Economical designation related. CO3: Students imagination thinking power will be increased .
	B.A.-I Hindi **-2 (Sahitya Ratna)**	CO4: To help students to increase love for nation and awareness for social emotion. CO5:. Students acquaint with gender , cases and also familiar with correct grammer and he also understand different idioms and phrases. CO6: Students familiar with development skills and about he which is written in devanagari script.

	B.A.-II Hindi P **-3 (Adhunik Gadhya** :**kahani evam Vyavahaarik Hindi)**	CO7: Students familiar with post centuary Hindi stories. CO8: Contemporary lifestyle and whole meaning of life he understand . CO9: Modern lessons a new values , students become familiar and developedhis own points of views. CO10: Students developed his taste and critical view to wards modern art.
	B.A.-II Hindi P-4 **(Hindi Kavya**: **vyakaran evam lekhan)**	CO11: Students become familiar with spiritiual period and tradition of social, religious and cultural conditions. CO12: Students studies spiritual poets including its vivesand virtues according to ancient and medieval culture. CO13: Students presents importance of romance and bravery

		through poems. CO14: Creates emotion of love in the mind of students towards poems .
	B.A.-II Hindi P -**5 (Adhunik Gadhya** :**Upnyaas evam Vyavhaarik Hindi**)	CO15: Students become familiar with modern Hindi Novels. CO16: Students understands contemporary life and its meaning . CO17: Students develop their point of view towards modern teaching and new values. CO18: Students enable to taste and he also take interest about critical point of view towards art of novels .
	B.A.-II Hindi P-**6 (Hindi Kavya** : **Vyakaran evam Lekhan)**	CO19: Students understands about the background of modern Hindi literature. CO20: Students understands about nature and human pain and through chhayawad and pragatiwad . CO21: Students become familiar with social as well as economic conditions after post independene.

	B.A.-III Hindi P -7 **(Vishesh Lekhak** : **Krushna sobati** (**Badalon ke Ghere**)	CO22: Students become familiar with versatile personality and intelligence of author CO 23 : He decided the place of the author CO 24 : He become familiar with the work of the author CO 25: He become familiar with her thoughts. CO 26: He also studies micro appreciation of the authors work.
	B.A.-III Hindi P -**8** **Kavyashastra**	CO27 : He understands about the process of creation of literature. CO28 : He acquarts with different between prose and poetry. CO29 : He seware familiar with new trends of literature. CO30 : He comprehends principles of prose and poetry CO31 : He understands the power of words. CO32 : He understands figures of speech.
	B.A.-III Hindi P-**9 Adhikalin aur madhyakalin Hindi sahiatya ka itihaas (**1050 - 1900)	CO33: Students asquait with the background of Hindi literature. CO34: He learn historical study of Hindi literature . CO35: He also introduced general study of Hindi literature. CO36:He become familiar with the development of Hindi literature and its history.
	B.A.-III Hindi P -10 **Prayojanmulak Hindi**	CO37: Students acquairts with experimental Hindi nature and its development. CO38: Students become familiar with moder n mass-communication and the increased the user Hindi language. CO39: He increases his taste to use Hindi and about Hindi correspondence. CO40: Students become familiar with official as well as correspondence in Hindi language.

		CO41: Students understand the we a importance of the language in day today life. CO42: Through Hindi language students try to develop skill to acquire job.
	B.A.-III Hindi P-**11 Hindi Bhasha**	CO43: Students introduced genral things about Hindi language. CO44: Students introduced different types of Hindi language. CO45: Students enable to familiar with Hindi script and development. CO46: Students become vigilart about the we of correct language. CO47: Students become familiar with grammer.
	B.A.-III Hindi P -12 **Vishesh lekhika** : **Krushna Sobati** (**Samay Sargam**)	CO48: Students introduced with standard Hindi in grammer. CO49 : Students introduced with intelligence and personality if the author. CO50: Students decided the place of author. CO51 : Students understands about the inspiarathion of authors in his literature. CO52: Students taste his in her novels. CO53 : Students acquainted with the work of the author.
	B.A.-III Hindi P -13 **Alochana**	CO54 : Students understands the different literature instruments . CO55 : He understands different experience of Rasas. CO56 : He understands the value and importance of his literature. CO57 :Understands critical aspects of different work. CO58: Understands metered (chhanda)
	B.A.-III Hindi P - 14 **Adhunik Hindi sahitya ka itihaas** (1900 - 2010)	CO59 : Students introduced with background modern literature. CO60 : Students studies modern Hindi literature. CO61: He also introduces with modern Hindi literature and ite authors. CO62 : Students developed different is Vidhas according for modern Hindi literature.
	B.A.-III Hindi P - 15 **Vyavhaarik Hindi**	CO63 :Understands the natures and importance of translation. CO64 : He introduced to advertisements and its rules. CO65 : Develop his skill of translation and advertisements. CO66 : Students understands business correspondence. CO67 : He used Hindi in his day todaylife and also understand the importance of it. CO68 : Students developed functional employed based skill through Hindi language.
	B.A.-III Hindi P - 16 **(BHASHA VIGYAN)**	CO69 : Develop scientific view toworded language . CO70 : Students acquaints with scientific knowledge of language. CO71 : Improve phonetic pronunciation

		CO72 : Improve pronounciation CO73 : Know about meaning and position of language.

	M.A.-I : P-I :**Adhunik Gadhya Sahitya**	CO74 : Students will be introduced to various prose writers in Hindi CO75 :Students imagination and thinking will be increased. CO76 : Students will know environment charactaristics of humans. CO77 : The feeling of Nationality and social responsibility will be enhanced.
	M.A.-I : P-II :Hindi **(Bhasha vigyan evam Hindi Bhasha)**	CO78 : Students develops scientific view towards language. CO79: Student knows about charactaristics structure and systems of language. CO80: Student knows about the phonetics, phonology, syntay and semantics of language. CO81 : Students knows about the Geographical expansion of Hindi language. CO82 : Students knows about devnagari script and it'sstandardisation. CO83 : Student knows about Historical background of Hindi language.
	M.A.-I : P-III :Hindi **(Prayojanmulak Hindi)**	CO84 : Students knows about various forms of Hindi. CO85 : Students knows about the Constitutional provision of Hindi as a language of communication . CO86 : Students knows about different Registers related with spheres of knowledge. CO87 : Students knows about Hindi as a language of Governance. CO88 : Students knows about computer , Internet , Link , Browsing, Hindi websites , Web-Magazine etc.
	M.A.-I : P-IV :Hindi **(Patrakarita)**	CO89 : Students knows about print Journalism and printing. CO90 : Students know about laws and code of conduct regarding press. CO91 : Students know about various unions of Journalists. CO92 : Students know about Management of Journalism.
	M.A.-II : P-V :Hindi **(Adhunik Hindi**	CO93 : Students know about Modern Hindi Poetry . CO94 : Students know about various poets of Hindi

	Kavita)	language. CO95 : Enhancement of Modernism , universalism and scientific attitude will be increased.
	M.A.-II : P-VI :Hindi **(Kavyashastra evam Sahityalochan**)	CO96 : Students know about emotion thought and values in a work of Art. CO97 : Students knows the principles of post modernism. CO98 : Students knows the critical tendencies of Hindi.
	M.A.-II : P-VII :Hindi **(Hindi sahitya ka itihas)**	CO99 : Students knows about the development of Hindi language. CO100 : He learn historical study of Hindi literature . CO101 : He also introduced general study of Hindi literature.
	M.A.-II : P-VIII :Hindi **(Anuwad : Sidhant aur Prayog)**	CO102 : Students knows about importance of translation in Study. CO103 : Students knows about importance of translation in global understanding . CO104 : Students knows about the employment generated by translation.

Dr. M. D. Shinde
Department of Hindi

DEPARTMENT OF HISTORY

Sr.No.	Name of the program	Course Outcomes
1	**B.A.I** **Semester I & Paper I** **Scientific Method**	**Unit 1** :Student know the definition of Science and common sense, Science and religion,as well as Natural Sciences and Social Sciences positive and normative Science etc. **Unit 2** :Students knows Principles of objectivity Principles empiricism, Principles of casual relation, Principles of uniformity of nature. **Unit 3** :Students know the nature of Scientific observation; its benefits its fallacies etc. **Unit 4** :Students know the experimental methods of Mill. **Unit 5** :Students know different types of inspiration,Scientific methods and its stages.
	B B.A.I **Semester II & Paper II** **Scientific Method**	**Unit 1** :Students know the Hypothesis Its definition,importance and use of it. **Unit 2** :Student know the meaning of definition. its format rules and types, nature and types and types of classification. **Unit 3** :Students get the information about government laws,Natural laws and General laws. **Unit 4** :Student know about methods and technique,questionnaire and interview. **Unit 5**:Student know about Computer and its parts,functioning, uses and characteristics as well as information and technology and its
	B.A.I **Semester I and Paper I** **Chapati Shivaji Maharaj And His Time**	**Unit 1** :Students will know the background of the rise of Maratha empire and the contribution of Shahaji Raje and Jijabai in the rise of Maratha empire. **Unit 2** :Students will know about the struggle of Chatrapati Shivaji Maharaj against Adilshahi and his victory Jawali, struggle against Afzal Khan and siege of Panhala. **Unit 3** :Students will know the struggle between

		Chatrapati Shivaji Maharaj and Moguls. Including raid of shahista Khan, plunder of Surat and meeting at Agra, expedition of Mirza Raja Jaysingh. **Unit 4** :Students will know the great moments in the life of Chatrapati Shivaji Maharaj in detail. 1.Coronation 2. Karnataka expedition.
	Semester II and Paper II	**Unit 1** :Students will know about of Chatrapati Sambhaji Maharaj. Portuguese and Siddi and his struggle with Moguls. **Unit 2** :Students will know the great work of the Chatrapati Rajaram Maharaj. Maharani Tarabai and the knights Santaji Ghorpade and Dhanaji Jadhav in the Maratha freedom struggle. **Unit 3** :Students will know the Central, Regional, and Village administration of Maratha empire **Unit 4**:Students will know the characteristics of Maratha Army administration,Forts and Judicial system
	B.A.II **Semester III and Paper III** **Modern Europe**	**Unit 1 :**Students will know about Industrial revolution,its causes,courses of development and effects on the world **Unit 2 :**Students will know the French revolution,its causes courses of development and effects as well as the its gift of Liberty, Equality and Fraternity to the world. **Unit 3 :** Students know the rise of Napoleon Bonaparte, reforms by him,his conquests,his policy and his downfall. **Unit 4 :** Students know the Vienna congress, life and work of Metternich and his downfall,concert of Europe etc
	B.A.II **Semester IV and Paper V** **Modern Europe**	**Unit 1 :** Students will know the French revolution-1830,France between 1830 to 1848 A.D. and the revolution-1848. **Unit 2 :**Students will know previous life of Napoleon III, his international policy, External policy and his defeat. **Unit 3 :**Students will know about the unification of Italy as a important movement of the politics of Europe, Its

		background steps and effects. **Unit 4 :**Students will know about background of unification of Germany, Its steps and effects.
	B.A.II **Semester IV and Paper VI** **Modern India (1857-1950)**	**Unit 1:**Students will know about Non co-operation movement,Quit India movement civil disobedience movement and Mahatma Gandhijis contribution in the freedom movement. **Unit 2:**Students will know about the revolutionary organization established in Bengal Maharashtra and Punjab. **Unit 3:**Students will know about rise and growth of Muslim communalism, constitutional developments and Subhashchandra Bose and Indian National Army. **Unit 4:**Students will know about negotiations for independence and partition, Integration of princely states and salient features of Indian constitution.

Dr. C.S. Chavan
Department of History

DEPARTMENT OF LOGIC (I.D.S.)

Sr. No.	Name of the Program	Program Outcome
1.	**B.A. Logic**	1) Bachelor of Arts graduates are also able to go into non-Arts related professions via graduate coursework study including marketing, finance and accounting, law, teaching, journalism and media. 2) Bachelor of Arts students study ideas, movements and theories in culture, society, history, language, reasoning and more. Extensive reading and research helps arts students to form a broad understanding about the world around them and the ways in which humans connect and interact. 3) Bachelor of Arts degree graduates are able to synthesize complex information and communicate it concisely both orally and in written form. 4) Bachelor of Arts students develop strong analytical skills – the ability to break ideas and issues down into their component parts and drill down to the root of problems while considering possible solutions. 5) Bachelor of Arts students know how to find information, and have the discernment to distinguish between good, authoritative information and poor quality, unreliable information. As part of their studies, arts students are required to find and research a large number of primary and secondary resources, and distil and analyze the most relevant points to create a clear argument
2	**B.A. Logic**	**SPECIFIC OUTCOME**
		After successfully completing a BA with Logic: 1) Students will be able to explain logical texts and positions accurately, 2) Students will be able to identify and apply research methods consistently, 3) Students will be able to apply their logical learning to important public issues. 4) Students will be able to articulate why logical understanding is valuable in such debates. 5) Students will be able to describe the ways in which the formal techniques of logic are important to philosophical research. 6) Students will be able to explain epistemological concepts such as the nature of knowledge, justification, evidence and skepticism, and to

		summarize and evaluate major philosophical positions in relation to each

Course Outecome

B.A -II	Syllabus Topic	Objectives	Topic outcome
SEM-III **Propositional logic**	**Unit 1.** **The nature of logic: Logic as the study of Inference. Nature of Inference. Deductive and Inductive Inference.**	To study validity of inference.	Students know the difference between form and matter of arguments.
	Unit 2. **Nature of Proposition: Distinguish between proposition and sentence Importance of symbolisation**	To know distinction between Simple, Compound and general propositions.	Students can understand function propositions.
	Unit 3. **Modern classification of propositions: Compound propositions**	To know the distinction between traditional classification of propositions and modern classification of propositions	Students can understand the truth function of compound propositions.
	Unit 4. **Rules of inference and replacement Direct proof method' Indirect proof method and Conditional proof method**	To know how conclusion drawn from two premises jointly.	Students can understand rules of inference and Students know how we can draw the valid conclusion from two premises.

B.A -II	Syllabus Topic	Objectives	Topic outcome
SEM-IV **Predicate Logic**	**Unit 1.** **Introduction to predicate logic Individual Variables and constants Singular and general propositions and symbolization**	To know what is symbolic expression of variables and constants	Students can understand difference between singular and general propositions
	Unit 2. **Propositional function** **Quantifiers- Universal and Existential** **Formal proof** **Rules of quantifier negation**	To know what are the rules of quantifications	Students know the validity of arguments in general arguments i.e. syllogism
	Unit 3. **Set theory** **Element of set** **Sub-set** **Universal set** **Null set** **Intersection set**	To know what is the set theory and it's relation	Students can understand different sets in the external worlds
	Unit 4. **Venn diagram**	To know the meaning and importance and study of diagrams	Students can understand validity of arguments in diagrams

Dr. A. V. Nama
Dept. of Logic

DEPARTMENT OF MARATHI

Program outcomes, program specific outcomes and course outcomes for all programs		
1	**B.A Marathi**	
Sr. No.	**Name of the program**	**Course outcomes**
	B. A. Marathi FY Sem-I Optional Marathi	1.To strengthen the awareness of Marathi language and literature among students 2.To introduce Marathi literary types and trends to students 3.To make them understand the concept, form and tradition of Marathi story 4.To explain the students the story teller and the theme of the story 5.To develop the oratorical skills among students 6.To help students understand the concept, form and tradition of Marathi poetry 7.To enable the students an awareness of the poets and their poetry 8.To develop official letter writing skills among students
	BA FY Sem-I Compulsory Marathi	1. To create awareness and aptitude regarding Marathi language and literature among students 2. To make the students aware of Marathi writers and their literary works 3. To strengthen human values and national integrity among students 4. To enable the students to face competitive examinations 5. To develop information and technology skills of students

		6. To develop essay writing skills among students
	BA SY Sem-III Marathi Paper III	1. To introduce students to poetry 2. To make students aware of the development of Marathi poetry 3. To inform students about appreciation of poetry 4. To make students understand images and symbols 5. To develop the understanding of poetic style and form
	BA SY Sem-III Marathi Paper IV	1. To make students aware of story as a literary type 2. To introduce students to historical development of Marathi story 3. To inform students about contemporary Marathi story 4. To make students understand the form of summary writing
	BA SY Sem-III Marathi Paper IV	1. To highlight the importance of writer in literature 2. To make students aware of theme and experience in novel 3. To create awareness regarding interpretation of realism in literary process 4. To study the point of view of novelist
	BA SY Sem-IV Marathi Paper VI	1. To create awareness among students of social development of the writers of biography and autobiography 2. To make students know the form and features

		of biography and autobiography 3. To study the motives and occasions in biography and autobiography 4. To find out similarities and dissimilarities between biography and autobiography
	BA TY Sem-V Marathi Paper VII	1. To introduce students to literary theories 2. To make them aware of the form of literature 3. To enable an understanding of various occasions of literature 4. To introduce students to original causes of literature 5. To strengthen the literary aptitude
	BA TY Sem-VI Marathi Paper XII	1. To introduce students to the powers of words 2. To make them aware of different literary types 3. To help them know the language thought in literature 4. To enable understanding of literary values 5. To develop literary thought and awareness
	BA TY Sem-V Marathi Paper VIII	1. To introduce students to the form and importance of language in human life 2. To develop scientific attitude towards language 3. To enable understanding of linguistic motives 4. To study language transformation 5. To illuminate Marathi grammar
	BA TY Sem-VI Marathi Paper XIII	1. To discuss the correlation between linguistics and language 2. To introduce students to descriptive

		linguistics 3. To illuminate the relation between Marathi language and dialect 4. To throw light on the impact of different languages on Marathi 5. To understand the grammar of Marathi language
	BA TY Sem-V Marathi Paper IX	1. To introduce students to the Medieval Marathi literature 2. To enable understanding of the motives of literature during this period 3. To study the form and features of the Medieval Marathi literature 4. To create awareness about the cultural background during this period 5. To bring out the relation between literary procedure and trends 6. To discuss various types of literature and language during this period
	BA TY Sem-VI Marathi Paper XIV	1. To inform students about the motives of the Medieval Marathi literature 2. To introduce the background to the Medieval Marathi literature 3. To study the form and features of the Medieval literature To correlate the literary trends and literature of this period
	BA TY Sem-V Marathi Paper X	1. To introduce to students the applications of Marathi in different life situations

		2. To understand letter writing as a means of bringing two persons together 3. To help students understand the application of language in commercial field 4. To motivate students into acquiring language skills 5. To empower students to make creative use of language
	BA TY Sem-VI Marathi Paper XV	1. To introduce to students the applications of Marathi in different life situations 2. To enable personality development and acquisition of skills in expression 3. To help students understand the application of language in commercial field 4. To motivate students into acquiring language skills 5. To make students aware of writing skills
	BA TY Sem-V Marathi Paper XI	1. To discuss the modern Marathi literary trends 2. To explain the concept, motivation, from and features of Rural and Dalit literature 3. To study the origin and development of Rural and Dalit literature 4. To interpret the poems in terms of Rural poetry 5. To discuss the Dalit story in terms of theme, socialism, language and thought
	BA TY Sem-VI Marathi Paper XVI	1. To study the background of modern Marathi literary trends 2. To discuss the concept, motives and form of

		feminine and Islamic literature 3. To illuminate the origin and development of feminine and Islamic literature 4. To study feminine novels in terms of theme, socialism, incidence, occasion, characters and language 5. To discuss Islamic autobiographies in terms of theme, life, conflict, socialism, thought and language

Mr. H. B. Mate
Dept. of Marathi

DEPARTMENT OF N.S.S.

Sr. No.	Name of the program	Program outcomes
1.	**B.A. NSS**	**PO1:** Students understood basic concepts, information related to National Service Scheme . **PO2:** Students acquired basic knowledge, processes related with NSS. **PO3:** Students acquired skills in Social Work (Rally, Voter Awareness, Campus cleaning, tree plantation).
Sr. No.	**Name of the program**	**Program specific outcomes**
2	**B.A. – I- NSS**	**PSO1:** Students understood History, basics concept of NSS specially related to social work. Students understood contribution of social reformers **PSO2**:.Students understood contribution of social reformers.**:** Students identified NSS, regular activities.
	B.A. - II -NSS	**PSO1:** Students sensitize about background knowledge of NSS , Social Science. **PSO2:** Students familiarized with social concept in society. **PSO3:** Students developed skills about personality development, leadership and social survey. **PSO4:** Student understood the working with individual ,group and community. **PSO5 :** Students familiarized with rural community, functional structure of Panchayat Raj. **PSO6 :** Students sensitize about human right, NGO.
Sr. No.	**Name of the program**	**Course outcomes**
3	**B.A. - I NSS Paper I (NSS)**	**CO1**: Students sensitized about history of social work in India. **CO2:** Students familiarized with contribution of social reformer. **CO3:** Students understood the National Service Scheme.
	B.A. - I NSS Paper II (NSS)	**CO4:** Students understood the NSS regular Activities **CO5 :** To understand special camping pogramme. **CO6:** Students understood with impact of modernization on family and marriage system and social problem.
	B.A. - II NSS Paper	**CO7:** Student understood concept of personality

	III (NSS)	development. **CO8:** Student understood concept of leadership **CO9:** Students developed skills about Social survey.
	B.A. - II NSS Paper IV (NSS)	**CO10:** Students familiarized with working individual, group and community. **CO11:** Students understand mechanism of programme planning. **CO12:** Students understand the scheme for rural development.
	B.A. - II NSS Paper V (NSS)	**CO13:** Students identified and understand environment protection system. **CO14:** Students understood the rural life and rural community. **CO15:** Students understood the functional structure of Panchayat raj .
	B.A. - II Geography Paper VI (Economic and Demographic Geography of India)	**CO16:** Students understood the importance of Consumer Protection Act. **CO 17** : Students understood the importance of Human Right and special group. **CO 18** : Students understood the role of NGO in social development .

Head of the Department

DEPARTMENT OF POLITICAL SCIENCE

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs thought by you		
Sr.No.	**Name of the program**	**Program outcomes**
PO-1	**B.A. Political Science**	**Understanding** Political Theory concepts and Public Administration It also focuses on to understand local and state level politics and the essentials skills of political analysis required to participate actively in political debates.
PO-2	**Critical thinking**	**the ability to analyse and Predict socio political phenomena based on the study of existing socio economic determinants and part of experiences and Vesit to Local Self Government**
PO-3	**Effective Citizenship**	**The course Curriculum inculcates among students a basic understanding of the rights and duties of Citizenship and thereby to act as responsible citizens through the observation of important days such as Independence Day, Republic Day and Constituion Day and Develop the Ambition of student to create Ideal Leadership**
PO-4	**Communication**	**Establishment of linkeges between academics and Civil society at large so as to successful address social Political Problem. Debates, Seminars and Discussions are organised**
Sr.No.	**Name of the program**	**Program specific outcomes**
PSO-1	**B.A. Political Science**	Students of BA Political Science will be aware and understand the politics in all governments comparatively and to know the principles of good governance.
Sr.No.	**Name of the program**	**Course outcomes**
CO-1.	**Constitutional Government and**	1. The course acquaints Students with the constitutional design of state Structures and Institutions

	Democracy in India	and their actual working overtime.
CO-2.	**Introduction to Political Theory**	2.The course aims to introduce certain key aspects of conceptual analysis in political theory
CO-3.	**Modern Indian Political Thought**	3.This is an introductory paper to the concepts, ideas and theoriesthat developed in India. It highlights the main sources of the modern political tradition.
CO-4.	**Public Administration IDS**	4. The paper is an introductory course in Public Administration.
CO-5.	**Government & Politics of Maharashtra**	5. The course aims to introduce the structure and policy of Maharashtra Government, Panchyat Raj Sansthas and Local Self Government.
CO-6	**Political Sociology** **Introduction to International Politics**	**6.**The course aims to introduce certain key aspects ofconceptual analysis in modern political theory and the skills required toengage in debates surrounding the application of the modern concepts.
CO-7	**Comparative Government & Politics**	7. This Course is designed to give students a sense of some important theoretical approaches to understand international relations;
CO-8	**Western Political Thought**	8.The course aims to introduce the structures and politics of UnitedKingdom, USA and Switzerland.
CO-9		9.This paper aims to introduce the concepts, ideas and theories that developed inWestern country.

Dr. S. N. Salawde
Dept. of Political Science

DEPARTMENT OF PRAKRIT

20. Learning Outcomes

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs thought by you		
Sr.No.	**Name of the program**	**Program outcomes**
1.	**BA1, BA2, Ph.D.**	1. The students are enabled into acquiring and further strengthening different language skills- writing and speaking. 2. They are initiated into the aspects of literary types like- poetry, drama and fiction along with criticism. 3. The students acquire the understanding of the minor literary types like- essays, articles, one act plays etc 4. Helpful to strengthen moral values among students.
Sr.No.	**Name of the program**	**Program specific outcomes**
1.	**Literature**	1. The students are made aware of the representative Prakrit writes. 2. They are acquainted with the writers from different literary periods of India.
2.	**Language**	1. The students acquire insights into various aspects of language- Grammar and Phonology. 2. They are enabled into interpreting various aspects of language.
Sr. No.	**Name of the program**	**Course outcomes**
1.	**Ardhamagadhi Literature**	1. The students study various writers from Ardhamagadhi. 2. They acquire a comparative understanding of the writers belonging to different literary periods.
2.	**Maharshtri Prakrit**	1. The students are made aware of the representative Indian writers in Maharshtri Prakrit. 2. They are taught the ways of appreciating the Indian writers in terms of their sensibilities, insights and diction.
3.	**Apabransha Literature**	1. The students of Prakrit are made aware of various writers whose works have been brought into Marathi language. 2. This helps the students have a comparative approach

		to the texts.
	Structure and Function of Prakrit	1. The students are first of all initiated into Morphology and Phonology. 2. Afterwards they are enabled into acquiring an understanding of various levels of Syntax like Phrases, Clauses and Sentences. 3. They are also made conscious of the aspects of Discourse Analysis.

Dr. M. P. Shastri
Dept. of Prakrit

DEPARTMENT OF BOTANY

	One e.g. of POs, PSOs, and COs is given below
Programme Outcomes	**POs of General Higher Education Programmes should be identified by the University/Autonomous College offering the three year Programmes** **Sample POs** of General Higher Education Programmes: Students of all undergraduate general degree Programmes at the time of graduation will be able to PO1.**Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives. PO2.**Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology. PO3.**Social Interaction**: Elicit views of others, mediate disagreements and help reach conclusions in group settings. PO4.**Effective Citizenship**: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering. PO5.**Ethics**: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them. PO6.**Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development. PO7.**Self-directed and Life-long Learning**: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes
Programme Specific Outcomes	**Sample PSOs of B Sc Botany** PSO1. The student can understand the basic concept of microbiology, the viruses, diversity of bacteria and about the Mycoplasma PSO2. The student can understand importance of algae and they can understand in detail about the division Cyanophyta along with its one detailed example of *Nostoc* and the division chlorophyta along with its one detailed example of *Spirogyra* PSO3. The student can understand about the general introduction of true fungi and they can understand about division of Zygomycotina and Ascomycotina PSO4. The student get an detailed idea about Archegoniate PSO5. The student can understand about the life cycle and economic importance of the Bryophytes: *Riccia,* Pteridophytes: *Selaginella* and Gymnosperms: *Cycas* PSO6. The student can understand about the Climatic and Edaphic factors of Environment, to analyze the relationships among animals, plants and microbes PSO7. The student can understand about the Ecological adaptations in plants, Plant communities, concepts of ecology and Ecological succession PSO8. The student can understand about importance of taxonomy, classification

	systems in taxonomy, methods of classification and rules of nomenclature, botanical gardens in India and can understand detailed identifying characters of family PSO9. Perform procedures as per laboratory standards in the areas of Biochemistry, Bioinformatics, Taxonomy, Economic Zoology and Ecology PSO10. Understand the applications of biological sciences in Apiculture, Aquaculture, Agriculture and Medicine PSO11. The student can understand the basic concept of apical meristem PSO12. The student can understand in detail about the tissue system in plants PSO13. The student can understand importance of the Tissue systems and their functions, Secondary body of the plant PSO14. The student can understand about the process of photosynthesis, light reaction and dark reaction, Nitrogen metabolism PSO15. The student can understand about the introduction, terminologies in genetics, Medelism and principles of inheritance, classical genetics, allelism PSO16. The student can understand the knowledge about the Economic Botany (like legumes, plant fibers, vegetable oil sources, drug, perfumes and cosmetics yielding plants and ornamental Plants
Course Outcomes	**Sample COs** of the course "Botany" CO1 To get the knowledge about the Introduction of Microbiology and with the characters, structure and economic importance of viruses. Knowledge about the forms, size and diversity of bacteria and about the Mycoplasma CO2 To get the knowledge knowledge about what is Phycology and the characters, classification and economic importance of algae in respect of general Characters, occurrence, classification, Thallus organization & reproduction of division Cyanophyta along with the example *Nostoc* and division chlorophyta along with the example *Spirogyra* CO3 To know about characters, mode of nutrition & classification of the True fungi and to get the knowledge about the fungal division Zygomycotina and Ascomycotina CO4 Write down the classification and general characters of Archegoniate CO5 What are Bryophytes, Pteridophytes and Gymnosperms explain with suitable example CO6 To get the knowledge knowledge about ecology, ecological adaptations, climatic and edaphic factors, primary and secondary succession CO7 To get the knowledge about the Forms & structure of community along with Qualitative and quantitative characters of community, Ecological pyramids with Food chain and food webs, ecological succession CO8 Discuss in details about the introduction to Angiosperms taxonomy CO9 Note on different classification systems and its merit & demerits, Identification methods, Nomenclature, Principles and Rules of ICBN CO10 Explain in details about the technique of herbarium preparation and significance and to provide the morphological & reproductive characters of some important plant families CO11 What are the legumes give its examples their source, botanical nomenclature and economic importance.

	CO12 What are the plant fibers give its examples their source, botanical nomenclature and economic importance. CO13 What are the drug yielding plants give its examples their source, botanical nomenclature and economic importance. CO14 What is rubber give its examples their source, botanical nomenclature and economic importance CO15 Discuss about the ornamental plants and their value

Dr. S.P. Gaikwad
Department of Botany

DEPARTMENT OF CHEMISTRY

Department of Chemistry	**After successful completion of three year degree programme a student should be able to**
Programme outcomes	PO 1:- Provide a broad foundation in chemistry that emphasizes scientific reasoning and analytical problem solving with a molecular perspective. PO 2:- Create awareness of impact of chemistry on the social development & environmental chemistry. PO 3:- Solve the reaction mechanism and assign the final product. PO 4:- Achieve the skills required to succeed in the T-L process of schools, the chemical industries and professional's schools. PO 5:- Demonstrate, solve and develop an understanding of concepts of chemistry. PO 6:- Get exposure of a breadth of experimental techniques using modern instrumentation and chemistry software. PO 7:- Understand the importance of Periodic table of the elements and its role in organizing chemical information. PO 8:- Understand the interdisciplinary nature of the chemistry and to integrate the knowledge of Physics, Mathematics and other disciplines to a wide variety of chemical problems. PO 9:- Learn the laboratory skills needed to design safety and interpret chemical science. PO 10:- Enable to understand and critically interpret the primary chemical literature. PO 11:- Learn professionalism including the ability to work in teams and apply basic ethical principles.

Programme Specific Outcomes	PSO 1:- To acquire the knowledge of various discipline of chemistry through theory, practical's and industrial visits. PSO 2:- To explain formation, structure, bonding and reactivity of the basic chemical compounds. PSO 3:- To explain the nomenclature, stereochemistry of compounds and mechanism of chemical reactions. PSO 4:- To identify basic chemicals and their applications in agriculture, food science, medicinal science, material science, defense, biochemical science, electronics, communication and transportation. PSO 5:- To solve numerical problems related to chemical science. PSO 6:- To handle both basic and modern equipments for chemical analysis of samples and acquire analytical skills and develop research attitude. PSO 7:- To understand good manufacturing practices and safety strategies.

COURSE OUTCOMES

Sem.- I **Paper-I** **Physical Chemistry**	CO-1: To discuss scope of chemical kinetics, rates, concept of molecularity, order, Derivations of rate constants, examples, pseudo unimolecular reaction and various methods to determine the order of a chemical reaction. CO-2: To discuss, how to plot graph, calculation of slope & intercept with their characteristic properties, rules of derivative and integration. CO-3: To explain spontaneous & nonspontaneous processes, second law of thermodynamics, cannot theorem and efficiency of cannot cycle. CO-4: To study ideal & nonideal gases, Boyle's law and its deviations, Vander Walls' equation, Isotherms & critical phenomenon, liquefaction process & Joule-Thomson effect.
Paper II **Inorganic Chemistry**	CO-1: To understand atomic Structure, shapes of orbitals, Quantum numbers and periodic properties CO-2: To know the types chemical bonding, radius ratio, crystal structure and Ionic Solids. CO-3: To understand Heitler–London Theory and Pauling-Slater Theory, VSEPR theory, Limitations of Hybridization. CO-4: To study atomic and molecular orbitals, L.C.A.O. Principle and different types of overlappings.
Sem.- II **Paper III (Organic Chemistry)**	CO-1:- To know the structure, bonding, reactivity of organic chemical compounds. CO-2:- To know the types, nomenclature, preparation, properties and uses of alkanes, alkenes, dienes, cycloalkanes and aromatic compounds. CO-3:- To understand the chemical reactivity and mechanisms of different types of reactions. CO-4:- To understand the concepts of isomerism and its types – optical, geometrical & conformational isomerism. CO-5:- To develop the research skills and understand the good manufacturing practices.
Sem.- II **Paper IV** **(Analytical Chemistry)**	CO-1:- To understand various qualitative and quantitative methods of analysis. CO-2:- To understand the concept of partition coefficient and its applications. CO-3:- To studies the physical properties of liquids such as surface tension, viscosity. CO-4:- To develop problem solving attitude related to chemical analysis. CO-5:- To study types of environmental pollution & make aware students and society to understand strategies to reduce environmental pollution. CO-6:- To study petrochemicals and properties of fuels.
B.Sc-I	CO-1: To study determination of order of chemical reaction in case of 1) hydrolysis of methyl acetate and 2) reaction between $K_2S_2O_8$ & KI with equal concentration by chemical kinetics. CO-2: To study determination of equivalent weight of magnesium metal by hydrogen gas displacement method.

Practicals:	CO-3: To study the heat of ionization of weak acid/weak base using neutralization reaction. CO-4: To study the properties of viscosity coefficient of pure liquids. CO-5: To prepare standard solutions of compounds and their use in determination of unknown strength of given samples. CO-6: To detect the basic radicals by spot tests. CO-7: To study the technique of paper chromatography for separation and identification of the radicals. CO-8: To estimate the amount of aniline, acetamide and aspirin in the given samples. CO-9: To prepare the organic compounds and determine their physical constant. CO-10: To study qualitative analysis of organic compounds.
Sem.- III **Paper V** **Organic Chemistry**	CO-1:- To understand the principles of spectrophotometric analysis and properties of electromagnetic radiations. CO-2:- To study the nomenclature of optical, geometrical ad conformational isomers with geometrical and conformational analysis of simple organic compounds. CO 3:- To study dihydric, trihydric alcohols, phenols and their chemical reactions and uses. CO 4:- To discuss the name reactions of aldehydes and ketones with their mechanisms. CO 5:- To study preparation, structure, reactivity and uses of carboxylic acids, diazonium salts with their synthetic applications. CO-6:- To study preparation and properties of ethers and epoxides. CO 7:- To develop problem solving attitudes related to chemical reactions.
Paper-VI **Inorganic Chemistry**	CO-1: The study the types of compounds as simple, double and complex salts. CO-2: To study nature, structure, physical & chemical properties of compounds. CO-3: To detect the metal ions by chelating agents. CO-5: To study different theories behind acids and bases. CO-6: To Study properties of d-block elements.
Sem.- III **Paper VII** **Physical Chemistry**	CO-1: To study process of electrolysis, terms like specific, equivalent & molecular conductance, Transport no. factors affecting transport no., kohlrausch law, its application to determine equivalent conductance at infinite dilution, Ionic product of water, degree of dissociation and solubility of sparingly soluble salt. CO-2: To understand different crystal systems, x-rays to detect crystal structure, unit cell, space lattices. Bragg's spectrophotometer to detect & interpret the crystal structure. CO-3: To study and understand thermodynamic property, entropy, its derivation with various definitions, concepts of entropy of mixing of gases, physical transformations, ideal gases with equations. CO-4: To study partition coefficient, distribution law and its applications.
Paper-VIII	CO-1: To study qualitative as well as quantitative analysis of chemical compounds.

Inorganic Chemistry **B.Sc-II Practicals**	CO-2: To study the theory and concepts of gravimetric analysis and its applications in ores, minerals. CO-3: To study the industrial processes for manufacture of different inorganic heavy chemicals. CO-4: To study basic principles involved in manufacture of iron and its alloys with their applications. CO-1: To study chemical kinetics of various types of reactions. CO-2: To study sample analysis by Conductometry. CO-3: Study of calculations of specific and molar refraction of $-CH_2$ group using refractometer. CO-4: To use polarometer to determine specific rotation of sugar solution. CO-5: To prepare and study properties of various types of complex CO-6: To study semi micro analysis of binary mixtures. CO-7: To study the gravimetric estimation of Iron and Barium. CO-8: To study and estimate the unknown amounts in Fertilizer, soda-ash, water sample and vinegar volumetrically. CO-9: To study organic spotting of compounds. CO-10: To prepare and determine physical constants of organic compounds.
Sem.- V **Paper-IX** **(Physical Chemistry)** **Paper-X** **(Inorganic Chemistry)**	Co-1: To study theory and concepts of phase rule and its applications to one component and two component systems with the help of phase diagram. Co-2: To understand thermodynamics of electrode potential in an electrochemical cell, Nernst equation, types of electrodes, derivations for chemical cell, electrode & electrolyte concentration cell with various examples. Applications of E.M.F. measurement in determination of pH & solubility. Co-3: To study laws of photochemistry, concept of quantum yield, photochemical reactions such as decomposition, photosensitized reactions, and photodimerization. Explanations of phenomenon like fluorescence & phosphorescence with Jablonski diagram. Chemiluminessence phenomenon. Co-1: To study and understand the nature of metal ligand bonding in transition metal complexes (by CFT and MOT). Co-2: To understand the types of nuclear reaction, use of radioactive elements in atomic energy along with some applications of some isotopes as tracers. Co-3: To study bioinorganic chemistry, role of some metal ions in biological processes. Co-4: To study phenomenon of catalysis and its applications. Co-5: To understand the importance of organic fertilizers rather than inorganic fertilizers for healthy growth of plants.

Paper XI **(Organic Chemistry)**	CO-1:- To study the and understand spectrophotometric methods of analysis (IR, NMR, Mass) and their applications in structural deductions of organic compounds. CO-2:- To study and explain conformational isomerism in cycloalkanes and its derivatives. CO-3:- To understand mechanisms of certain name reactions with their synthetic applications. CO 4:- To study the preparation and synthetic applications of EAA and Malonic ester. CO-5:- To develop problem solving attitude and inculcate research oriented skills. CO-6:- To Discuss a solve problems based on UV, IR, NMR spectroscopy and Mass spectrometry.
Paper-XII **(Analytical and Industrial –Physical Chemistry)**	CO 1:- To understand the fundamentals of colorimetry and its applications in qualitative and quantitative analysis. CO 2:- To understand basic concepts of Conductometry and its applications in qualitative and quantitative analysis. CO 3:- To study fundamentals of the potentiometry and develop the analytical skills required for sample analysis and its applications in qualitative and quantitative analysis. CO 4:- To understand the basic concepts of flame photometry and its applications in qualitative and quantitative analysis. CO 5:- To study the basic concepts of electroplating and its applications in qualitative and quantitative analysis. CO-6: To develop the skills required for chemical analysis using these instrumental techniques.
Sem.- VI **Paper-XIII** **(Physical Chemistry)**	CO-1: To study the basics behind spectroscopy, fundamental equation, rotational spectra for diatomic molecule, vibrational spectra their selection rules & applications of these spectra. CO-2: To study thermodynamic property free energy, conditions for spontaneity of reaction derivations to explain change of phase, Gibbs-Helmholtz equation, Clapeyron Clausius equation, concept of vant Hoff equilibrium box, using this box how to prove law of mass action and reaction Isothem. CO-3: To study and apply Raoult's law to ideal and nonideal solutions, distillation behavior of completely miscible solutions, studying mutual solubility of partially miscible solutions. CO-4: To understand temperature coefficient, concept of energy of activation, with various theories, Third order reaction, derivation, characteristics and examples.
	Co-1: To study the sub-transition elements of periodic table with emphasis on their properties and preparation of transuranic elements. Co-2: To study the metals, semiconductors, superconductors with their properties and

Paper XIV **(Inorganic Chemistry)** **Sem.- VI** **Paper-XV** **Organic Chemistry**	applications. Co-3: To study structural chemistry mainly related to diborane, borazine and some xenon compounds. Co-4: To study theory and concepts of corrosion, and destruction of metals, passivity of metals by different electro processes. Co-5: To study the applications of organometallic compounds in industrial and synthetic organic chemistry. CO-1:- To study the synthesis, properties and importance of Heterocyclic compounds. CO-2:- To study classification, structural determination and properties of Carbohydrates-Glucose, Sucrose, Maltose, Starch and Cellulose. CO-3:- To study classification of vitamins, hormones and structural determination of Vit A, Adrenaline and Thyroxin by analytical and synthetical evidences. CO-4 :- To study classification and synthesis of dyes, various modes of application of dyes. CO-5 :- To have the knowledge of various pesticides, insecticides with their synthesis and uses. CO- 6 :- To study the classification of drugs, qualities of Ideal drugs and synthesis of drugs with their uses in curing of diseases.
Paper XVI **(Analytical and Industrial Organic Chemistry)** **Sem.- VI** **Practicals**	CO 1:- To know the importance of chemical analysis in industries. CO 2:- To study manufacture, properties and applications of high polymers, soaps and detergents. CO 3:- To study steps involved in the manufacture of sugar and ethanol, potential of sugar industry and process of fermentation of molasses. CO4:- To know different analytical techniques of Chromatography. CO 5:- To understand twelve principles of green chemistry and use of green techniques in synthesis of compounds. Co-1: To study and perform non instrumental experiments from chemical kinetics 1) To determine energy of activation for 1^{st} order and 2^{nd} order reactions. 2) To study effect of ionic strength, 3) effect of variation of concentration. Co-2: To determine partial molar volume using phenol-water system. Co-3: To study and perform Instrumental experiments in conductometry to measure 1) equivalence point of titration, 2) effect of substituent in disassociation constant. Co-4: To study and perform Instrumental experiments in Potentiometry 1) to measure pH, 2) end points of a acid-base and redox titration. To determine standard electrode potential and solubility of sparingly soluble salt. Co-5: To study to use colorimeter 1) to verify Beer's-Lambet law & 2) to determine concentration of unknown solution. Co-6: To study to use pH-meter to determine the degree of dissociation of weak acid. CO 7 :- To study separation and purification of organic binary mixture and identification of separated compounds (Chemical Separation) CO 8:- To study preparation, purification and determination of physical constant of

	organic compound (Calculations of theoretical and practical yields). CO 9:- To study preparation of various types of derivatives of organic compounds and their Identification. CO 10:- To analyise volumetrically samples are containing organic compounds (Sugar Analysis, Nitro group Analysis, Saponification, Acid-Ester/ Acid-Amide mixture analysis). CO 11- To understand accuracy, precision in chemistry practical and develop analytical skills as required in industries. CO-12: To study gravimetric analysis of samples CO-13: To prepare and study percentage purity of different coordination complexes CO-14: To separate and identify the components of a mixture by using ion exchange chromatographic techniques. CO-15: To determine acidity, turbidity, hardness of samples by volumetric estimations.

Dr. S..N. Battin
Department of Chemistry

DEPARTMENT OF INORGANIC CHEMISTRY

Department of Chemistry	After successful completion of two year degree program a student should be able to-
Program outcomes	PO 1:- Understand the major concepts in various disciplines of Chemistry. PO 2:- Inculcate scientific temperament amongst students and outside scientific community. PO 3:- Take informed actions, develop critical thinking and execute them for chemical analysis by various techniques. PO 4:- Achieve the skills required to succeed in the T-L process of schools, the chemical industries and research work. PO 5:- Demonstrate, solve and develop an understanding of concepts in chemistry. PO 6:- Get exposure of a breadth of experimental techniques using modern instrumentation and chemistry software. PO 7:- Understand the importance of Periodic table of the elements and its role in organizing chemical information. PO 8:- Understand the interdisciplinary nature of the chemistry and to integrate the knowledge of Physics, Mathematics and other disciplines to a wide variety of chemical problems. PO 9:- Learn the laboratory skills needed to design, safety and interpret chemical science. PO 10:- Enable to understand and critically interpret the primary chemical literature. PO 11:- Learn professionalism including the ability to work in teams and apply basic ethical principles.

Program Specific Outcomes	PSO 1 :- To develop knowledge, understanding and expertise in the field of chemical science. PSO 2 :- To understand theoretical principles, laws of subject and use them for chemical analysis both by instrumental and non instrumental methods of chemical analysis. PSO 3 :- To know chemical formulae, chemical reactions, mechanisms of reactions. PSO 4 :- To understand eco friendly chemical processes and study impact of chemistry on health and environment PSO 5:- To identify basic chemicals and their applications in agriculture, food science, medicinal science, material science, defense, biochemical science, electronics, communication and transportation. PSO 6:- To develop ability of solving numerical problems related to chemical science. PSO 7:- To identify and provide opportunities to excel in academic, industries and research work.

COURSE OUTCOMES

M.Sc. Ist year Sem.- I Paper I (Inorganic Chemistry– I)	CO 1 :- To understand the concepts of matter, waves, and study of interaction between matter and waves along with various kind of expressions ad derivations. CO 2 :- To know the theory of transition elements and study of physical properties, chemical properties, different parameters and properties of these elements in compound form. CO 3 :- To understand the patterns of orientation of orbital as well as its mechanism toward formation of bond in different types of compounds. CO 4 :- To understand the concepts of formation of metallic, non metallic, conducting, semiconducting, and insulating substances and its related properties. CO 5:- To study the chemistry of radioactive materials, its reaction, properties and application.
Sem.- I Paper II (Organic Chemistry)	CO 1 :- To understand various types of chemical reactions, its intermediates, mechanism, stability, stereochemistry and its application. CO 2 :- To study the concept of substitution name reaction, its different types, stereochemistry and theory involving it. CO 3 :- To understand the reaction of unsaturated compounds, name reaction based on it, and its applications. CO 4 :- To study the different types of elimination reaction rearrangement reaction, its mechanism, stereochemistry and applications. CO 5 :- To study the structure of molecule in three dimension and its various classification and types.
Sem.- I Paper III (Physical Chemistry)	CO 1 :- To understand the principles and laws of thermodynamic reaction, its solution and its applications. CO 2 :- To study the speed as rate of progress of reactions including classification, methodology and applications. CO 3 :- To solve numerical problems of thermodynamic reaction. CO 4 :- To study the colloidal solution and macromolecules including polymers, its type, mechanism, reaction kinetics and derivation of rate of reaction.

Sem.-I **Paper IV** **(Analytical Chemistry)**	CO 1 :- To study the concept of error, its origin, classification, measurement, mathematical derivation, and its minimization. CO 2 :- To study and explain conformational isomerism in cycloalkanes and its derivatives. CO 3 :- To understand mechanisms of certain name reactions with their synthetic applications. CO 4 :- To study the preparation and synthetic applications of EAA and Malonic ester. CO 5 :- To develop problem solving attitude and inculcate research oriented skills. CO 6 :- To Discuss ad solve problems based on UV, IR, NMR spectroscopy and Mass spectrometry.
Sem.- I **Practical I** **(Inorganic Chemistry + Analytical Chemistry)**	CO 1:- To study the synthesis and determination of purity of inorganic complex salt. CO 2:- To estimate the percentage of different elements in particular ore sample, by thermo gravimetrically and titrametrically. CO 3:- To determine the amount of medicinal compound in given drug sample titrametrically. CO 4:- to estimate the hardness, alkalinity ad salinity of water titrametrically. CO 5 :- to study the Conductometry and potentiometric titration. CO 6:- To develop the research skills and understand the good manufacturing practices.

Sem.- I **Practical II** **(Organic Chemistry + Physical Chemistry)**	CO 1 :- To study the qualitative analysis, separation and determination of chemical compounds by mixture separation. CO 2 :- To study the instrumental and non instrumental analysis. CO 3 :- To determine the amount of medicinal compound in given drug sample titrametrically. CO 4 :- To study the kinetics of the hydrolysis of reaction CO 5 :- To gain the knowledge of adsorption of acid on activated charcoal.
Sem.- II **Paper V** **(Inorganic Chemistry)**	CO 1 :- To study the various aspects like synthesis and properties of non transition elements CO 2 :- To study the uses of organometallic compounds as catalyst in synthesis of various commercial based chemicals. CO 3 :- To gain the knowledge of lanthanide and actinide series along with its, properties, characterization and behavior. CO 4 :- To study the occurrence, extraction, properties and applications of copper, silver, gold, zinc, tin and lead. CO 5 :- To gain the knowledge of role of biological ions in different processes.

Paper VI **(Organic Chemistry)**	CO 1:- To understand the concept of different name reactions, their mechanisms and their synthetic applications. CO 2:- To study action of mechanism of different reagents in chemical reactions. CO 3:- To understand the mechanism and working of oxidation and reduction reactions and to study their name reactions. CO 4:- To study the different types of organometallic compounds and their applications. CO 5:- To gain the knowledge of different methodologies in organic synthesis, study of hydroboranes, enamines, protection and deprotection.
Paper VII **(Physical Chemistry**)	CO 1:- To study the different aspects of photochemistry and its different concepts. CO 2:- To gain the knowledge of concepts in electrochemistry and their applications. CO 3:- To understand the working and mechanism of compounds in bio-physical chemistry. CO 4:- To study the kinetics of different order of reactions and determination of reaction constants and solve related numerical problems.
Paper VIII **(Analytical Chemistry)**	CO 1:- To study the concepts of Ultraviolet Spectroscopy and solve related problems. CO 2:- To study instrumentation, principle of working, factors affecting the absorption in Infrared Spectroscopy technique. CO 3:- To understand the basic principles and working of Nuclear Magnetic Resonance (NMR) spectroscopy. CO 4:- To gain the knowledge of principle, instrumentation, working of Mass Spectrometry and its applications. CO 5:- To study the principles, instrumentations and workings of Atomic Absorption Spectroscopy and Inductively Coupled Plasma Spectroscopy. CO 6:- To develop the ability of solving numerical problems based on IR, NMR, UV spectroscopy and Mass Spectrometry.
Practical I (Inorganic Chemistry + Analytical Chemistry)	CO 1:- To study the synthesis and determination of purity of inorganic complex salt. CO 2:- To estimate the amount of Sn and Pb from given sample of alloy. CO 3:- To extract the caffeine from tea sample and determine its purity. CO 4:- To study instrumental analysis such as pH-metry and conductometry.
Practical II (Organic Chemistry + Physical Chemistry)	CO 1:- To study the various types of organic preparation. CO 2:- To study one step preparation and two step preparation of organic compounds. CO 3:- To prepare the derivatives of organic compounds. CO 4:- To study conductometry, potentiometery, pH metry methods of analysis. . CO 5:- To study adsorption of acid on activated charcoal. CO 6:- To study the phase equilibrium of three component system. CO 7:- To determine the rates of reaction by chemical kinetics.

Course Outcome.

M.Sc. IInd year **SEM III** **Paper I** **(Inorganic Chemical spectroscopy)**	CO 1:- To understand the group theory of molecules molecular symmetry, elements of symmetry, operations and molecular point groups. CO 2:- To study the electronic spectra of transition elements through the Orgel diagram, Tanabe Sugano diagram and charge transfer spectra. CO 3:- To study IR and Raman Spectra of inorganic molecules and its applications. CO 4:- To understand the concepts of microwave spectroscopy of simple inorganic molecules and effect of different factors on transition intensity and its application. CO 5:- To study the basic concepts, instrumentation, applications of Nuclear Magnetic Resonance (NMR) Spectroscopy with reference to inorganic compounds. CO 6:- To understand the basic principles, instrumentations and applications of PAS, PES and AES techniques.
Paper II **(Co-ordination Chemistry)**	CO 1:- To understand various theories such as VBT, CFT, LFT and MOT of octahedral, tetrahedral and square planar complexes. CO 2:- To study the thermal, magnetic and electronic properties of first transition elements through DTA and TGA. CO 3:- To understand the types of magnetic behavior of complexes and different theories and techniques in magneto chemistry. CO 4:- To study the general principles and catalysis by transition metal complexes as well as the current and future trends in catalysis. CO 5 :- To study the stability of tertiary complexes and mechanism of different reactions such as mimicking reactions, amino acids, ester hydrolysis and decarbonylation of B-ketoacids.
SEM.- III **Paper III** **(Nuclear Chemistry)**	CO 1:- To understand the structure of nucleus and the stability of the nucleus through different models. CO 2:- To study the different types of nuclear reactions, nuclear cross-section, coulomb scattering and potential barrier of different nucleus. CO 3:- To study the mechanism of nuclear fission through liquid drop model. CO 4:- To study the different types of nuclear reactors and reactors in India, shielding and health protection from nuclear radiation. CO 5:- To study the different Uranium and Thorium resources and heavy water manufacturing in India. CO 6:- To Understand the mechanism of interaction of different radiation with matter and radiolysis of water.

SEM.-III **Paper IV (Environmental Chemistry)**	CO 1:- To study the classification of air pollutants and their effect on living and non living things and major air pollution disasters. CO 2:- To study the types, sources, and classification of water pollutants with reference to their effect on life and environment. CO 3:- To understand methods of controlling air pollution through different techniques. CO 4:- To study the waste water treatments through aerobic, anaerobic, coagulation, disinfection and demineralization processes. CO 5:- To study different methods of sampling and analysis of air and water pollutants. CO 6:- To study the classification, effects of ionizing and non ionizing radiations on life, radioactivity, protection and control from radiation.

Practical(Non-Instrumentation) I	CO 1:- To determine the percentage of Si, Ca, Mg and Fe elements in given cement sample. CO 2:- To determine the percentage of Si, Al and Fe elements in Bauxite ore. CO 3:- To synthesize different co ordination complexes and determination of its purity. CO 4:- To determine the percentage purity of co ordination complexes.
SEM III **Practical II** **(Instrumentation)**	CO 1:- To Study the spectra and to determine extinction coefficient of sample by spectrophotometric method. CO 2:- To determine the concentration of metal in given sample by spectrophotometric method. CO 3:- To study the titration and dissociation constant of solutions by using pH meter. CO 4:- To determine the formula and stability constant of given complex conductometrically.
Sem.- IV **Paper I** **(Instrumental techniques)**	CO 1:- To understand the fundamentals, theory, instrumentation and applications of X-Ray and Neutron diffraction techniques. CO 2:- To study the thermal methods of analysis such as TGA, DTA, DCS, TMA and its application. CO 3:- To understand the principle, instrumentation and applications of Mossbauer spectroscopy in investigation of Fe and Sn compounds. CO 4:- To study the principle of ESR, hyperfine splitting, factors affecting G values and application to inorganic compounds. CO 5:- To study the effect of magnetic field on the spectra, structure determination and applications through NQR spectroscopy.
Paper II **(Co-ordination Chemistry)**	CO 1:- To study the classification of inorganic reactions (substitution reaction), reaction intermediates, order of reaction and reaction mechanism techniques to follow the rate of reaction. CO 2:- To understand the stereo chemical aspects of substitution reaction (SN^1 and SN^2) of octahedral complexes. CO 3:- To discuss the substitution reaction of labile transition metal complex.

	CO 4:- To study the mechanism of atom and electron transfer reactions of transition metal complex. CO 5:- To study the basics and types of photochemical reactions and the photochemistry of different co-ordination compounds. CO 6:- To understand the principles and fundamental relations in CD and ORD curves and their use in co ordination chemistry.
Sem.- IV **Paper III** **(Chemistry of Inorganic materials)**	CO 1 :- To study the different types of Solids , types of defects, determination of defects (structural and thermodynamic aspects) CO 2:- To gain the knowledge of synthesis of inorganic materials by using different techniques. CO 3:- To understand the types of ionic conductors, mechanism of ionic conduction and its applications. CO 4:- to study the electronic properties such as superconductivity, piezoelectricity, ferroelectricity and lasers and masers action with their applications. CO 5:- To study the magnetic properties of material through different theories and to study the applications of magnetic materials. CO 6:-To understand the structure and properties of different materials like metals, alloys, oxides, spinels, peroverskites and spin glasses. CO 7:- To study the basic concepts, classifications and applications of nanomaterials in inorganic chemistry and the properties, structures and applications of glass and ceramics.
Sem.- IV **Paper IV** **(Applied Inorganic Chemistry)**	CO 1:- To study the basic principles, thermodynamics and kinetic aspects in catalysis of transition elements. CO 2:- To study the classification of organometallic compounds, synthesis of zeolites, characterization and its application. CO 3:- To understand the properties of inorganic polymers and its different types. CO 4:- To gain the knowledge of non conventional sources of energy such as geothermal energy, energy from biogas and energy from fission and fusion reaction. CO 5:- To study the types, importance, properties, synthetic techniques and applications of nanomaterials.
Sem.- IV **Practical I (Non Instrumentation)**	CO 1:- To determine the amount of lead and iron from the given sample of Galena ore. CO 2:- To determine the amount of silica, iron, manganese from the given sample of Pyrolusite ore. CO 3:- To analyze the given sample of zinc ferrite by ion exchange method. CO 4:- to prepare different co-ordination complexes. CO 5:- to determine the percentage purity of given complex.

Sem.- IV **Practical II** **(Instrumentation)**	CO 1:- To determine the pKa value of indicators by spectrophotometric method. CO 2:- To study the stability constant of complexes by Jobs continuous variation methods by spectrometry. CO 3:- To determine the dissociation constant and pKa values of different samples by using pH meter. CO 4:- To study the precipitation titration and the normality of acids by Conductometry. CO 5:- To determine the concentration of given sample by fluorometric method. CO 6:- To study and interpret the X-Ray spectra and Mossbauer spectra of different samples.

Dr. S. N. Battin

Department of Chemistry

DEPARTMENT OF MATHEMATICS

Program outcomes, program specific outcomes and course outcomes for all programs thought by you		
Sr. No.	**Name of the program**	**Program outcomes**
1	**B.Sc. Mathematics**	PO1: Acquired the knowledge in advance mathematics
		PO2: Geometrical and analytical concepts were cleared Learnt basic lemmas ,theorems and Postulates PO3: Skills related to computers, software's, programming languages were understood.
		Program specific outcomes
1	**B.Sc. I Mathematics**	PSO1: Understood the concepts of algebra ,calculus basic differential equations and geometry. PSO2:Taken the practice of Solving problems PSO3: Understood the concepts related to Partial differential equation and vector algebra in three dimensions.
	B.Sc. II Mathematics	PSO4:Introduced Real analysis in primary level PSO5: Differential calculus along with tangent and normal to the curve and curvature have been understood PSO6: Algebra with only group theory has been introduced PSO7: Total differential equation and simultaneous differential equation is studied.
	B.Sc. III Mathematics	PSO8: Understood the ring and field theory along with linear algebra. PSO9: Understood the complex analysis PSO10: Learnt Partial differential equation PSO11: Understood the concepts of integral calculus and double integral along with beta and gamma function and improper integral.
		Course outcomes
1	**B.Sc. I Paper I Algebra**	CO1: Find Inverse of Matrix, Rank of Matrix, Characteristic equation of a matrix, Cayley Hamilton theorem CO2: Application of matrices to a system of linear equation, Eigen values and Eigen vectors. CO3: Understand the Complex number to find root modulus and argument of complex number, DeMoivers theorem.

2	**B.Sc. I Paper II Calculus**	CO4: Leibnit'z theorem Maclaurines and Taylors series Vector Algebra CO5: Reduction formulae and Euler's functions for determining degree of homogeneous equation
3	**B.Sc. I Paper III Geometry**	CO6: Understand the Plane ,Sphere and Change of axis along with rotation and translation CO7: Understand equation of normal
4	**B.Sc. I Paper IV Differential Equation**	CO8: Understand differential equation and its type, Exact Differential equation, Integrating factor, Bernoulli's equation CO9: Solution of linear differential equation with constant coefficient.
5	**B.Sc. II Paper V Differential calculus**	CO10: Find maximum and minimum value Jacobian of n order and find curvature of any given curve as well as find tangents and normals of any given curve.
6	**B.Sc. II Paper VI Real Analysis**	CO11 : To understand completeness of set of real number, absolute value of real number. CO12: Define sequence of real number, convergence of sequence, non-convergent sequence, Cauchy's General Principle of Convergence, Monotonic Sequence. CO13: Define series of real number, Cauchy root test, D'Alembert's test, Ratio test for convergence of series.
7	**B.Sc. II Paper VII Differential Equation**	CO14: To solve differential Equation of first order and of degree higher than the first, linear equation of the second order, homogeneous linear equation
8	**B.Sc. II Paper VIII Algebra-I**	CO15: Apply the theory of groups to number systems ,define group and its properties ,homomorphism and isomorphism
9	**B.Sc. III Paper IX Algebra – II**	CO16: Understand the theory of rings and fields as well as linear algebra
10	**B.Sc. III Paper X Complex Analysis**	CO17: Define Analytic Function, Complex Differentiation, Cauchy-Rieman equation. CO18: Complex Integration, Line Integration, Cauchy Integral Formula, Power Series, Laurent Series. CO19: Calculus of Residues, Residue at simple pole Residue at infinity, Cauchy residue theorem.
11	**B.Sc. III Paper XI Integral Calculus**	CO20: Acquire the knowledge of double integral beta ,gamma function and improper integral
12	**B.Sc. III Paper XII Partial Differential**	CO21: Learn to Partial Differential Equation, Formation of Partial Differential Equation, types of partial

	Equation	differential Equation. CO22: Lagrange's Method, Charpit's Method.
13	**B.Sc. III Paper XIII Metric Space**	CO23: Define metric spaces completeness ,compactness and open ,closed sets
14	**B.Sc. III Paper XIV Numerical Analysis**	CO24: Define operators, finite difference, Gauss Interpolation Formula, Newton's Interpolation Formula(Center, forward, backward) CO25: Numerical differentiation and integration, Maxima and minima of tabulated function, Difference equation.
15	**B.Sc. III Paper XV Programming in C**	CO26: Introduce Computer programming language C to write program for mathematical operations.
16	**B.Sc. III Paper XVI Integral Transform**	CO27: Define Laplace transform inverse Laplace transform and applications
		Program outcomes
1	**B.Sc. Statistics**	PO1: Acquired the knowledge in advance statistics
		PO2: Geometrical and analytical concepts were cleared Learnt basic theorems and Postulates PO3: Skills related to computers, software's, calculator were understood.
		Program specific outcomes
1	**B.Sc. I Statistics**	PSO1: Understood the concepts of Descriptive Statistics –I, Probability and Probability Distribution-I, Descriptive Statistics –II, Probability and Probability Distribution-II. PSO2: Taken the practice of Solving statistical data graphically, to compute various measures of central tendency, dispersion, moments, skewness and kurtosis. PSO3: Understood the concepts related to sample space and event, probability conditional probability and independence of events, correlation regression.
		Course outcomes
1	**B.Sc. I Paper I Descriptive Statistics -I**	CO1: Meaning of primary and secondary data, classification of data, graphical representation of data CO2: concept of central tendency of statistical data, Arithmetic mean, Geometric mean, Harmonic mean, Median, Mode. CO3: concept of dispersion, range, Quartile Deviation, Mean Deviation, variance and standard deviation. CO4: Moments, Raw moment, Central moment,

		Sheppard correction Skewness, Bowley's coefficient of skewness
2	**B.Sc. I Paper II Probability and Probability Distribution-I**	CO5: experiment, random experiment, sample space, algebra of event, CO6: Probability, Axiomatic definition of probability event based on permutations and combinations. CO7: conditional probability of an event, partition of sample space, independence of two event CO8: Discrete random variables, probability mass function.
3	**B.Sc. I Paper III Descriptive Statistics - II**	CO9: Bivariate data, Scatter diagram, Spearman's rank correlation coefficient CO10: Concept of regression, regression coefficient, CO11: Attributes, concept of Consistency, Yule's coefficient of association CO12: Price index number, weighted price index number, test of index number
4	**B.Sc. I Paper IV Probability and Probability Distribution-II**	CO 13: Expectation of random variable, variance of univariate distributions. CO 14: Two dimensional discrete random variable, bivariate probability marginal and conditional probability distributions. CO15: Expectation in bivariate distribution, theorems of expectation, conditional mean. CO16: Bernoulli Distribution p.m.f, mean, variance Discrete Uniform Distribution, Binomial Distribution

Dr. D. M. Zombade
Dept. of Mathematics

DEPARTMENT OF MICROBIOLOGY

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr.No.	**Name of the program**	**Program outcomes**
1	**B Sc I**	1.To attain the capability to employ in independent and 1) Student learned how to handle and care the compound microscope. 2) Student understood the proper staining techniques and cultivation of microorganisms as standard laboratory procedures. 3) They learned different sterilization procedures. 4) Students studied types of enzymes and microbial metabolism. 5) They got information about water pollution, microbiological analysis of pollution and treatment, as well as sewage treatment process. 6) They learned techniques used in dairy industries
	B.Sc. II	1) Students learned cytology and physiology of microorganisms. 2) Students learned bacterial genetics including mutations and genetic recombination. 3) They learned basic techniques and fermentation methods. 4) They performed experiments on isolation, cultivation and identification of pathogens. 5) Students learned how to test antibiotic sensitivity of pathogens.
Sr. No.	**Name of the program**	**Course outcomes**

	B Sc I	**Unit I -** Students got detail information about history and development of Microbiology. **Unit II** – Students learned nomenclature and classification of microorganisms. **Unit III –** They learned morphology and cytology of bacteria. **Unit IV –** Students learned characteristics of different organisms..
	Paper II	**Unit I -** Students learned principles and working of compound and electron microscope. **Unit II –** They learned principle, procedures and mechanism of different staining techniques. **Unit III –** They studied sterilization techniques. **Unit IV –** Students got detail information of culture media and cultivation techniques**.**
	<u>Paper III</u>	**Unit I** – student studied structure and functions of different macromolecules. **Unit II** – Students learned structure and types of enzymes. **Unit III** – They learned biochemical reactions in bacteria. **Unit IV** – They learned about microbial nutrition and their growth.
	<u>Paper IV</u>	**Unit I** –Students learned techniques of microbiological analysis of pollution and treatment . **Unit II** – They learned types of sewage and and sewage treatment and disposal. **Unit III** – Students learned about contamination of milk and pasteurization process. **Unit IV** – This course included types of diseases, mode

		of transmission , preventon and control of diseases.
	Practical course	-Students learned constructions and functions of instruments used in Microbiology laboratory. - They performed different staining procedures and cultivation techniques . - Some bacteria isolated, cultivated and studied in detail. - Different enzymatic reactions and biochemical tests are performed by the students. - Few fungal cultures were mounted and studied
	B.Sc II – Paper V	1. Students studied ultrastructure and functions of bacterial cells and endospore. 2. They got information about phases and types of growth. 3. Bacteria respond positively and negatively in different environmental conditions were studied. 4. Students learned about the bacterial metabolism and energy production. 5. They learned structure and cultivation of viruses.
	Paper VI	1. They studied structure and replication of DWP. 2. They learned about genetic code, transcription and translation 3. Mutation of bacteria was studied by the students. 4. Types of plasmids and their applications. 5. Methods of bacterial recombination were studied by the students.
	Paper VII	1. Students learned immune mechanism of human body. 2. Role of antigen and antibody. 3. Basic techniques used in clinical microbiology were studied. 4. Pathogenicity of microorganisms was studied in detail. 5. Few bacterial, fungal and bacterial diseases were

		studied by students.
	Paper VIII	1. Basics of Industrial Microbiology. 2. Students learned about different fermentation. 3. Different techniques of screening and strain improvements learned by the students. 4. Included microbiological essay. 5. Specific fermentations were learned by students.
	<u>Practical Course –</u>	- Different staining procedures performed by students. - They learned how to prepare culture media, reagents and solutions. - They performed different biochemical tests for identification of bacteria. - Students studied effects of environment on microbial growth. - They performed industrial screening procedures. - They learned techniques in pathological labs for identification of pathogens. - They learned determination of blood group, widal tests, estimation of glucose protein, isolation of DNA and growth phases of bacteria.

Dr. M.D. Chavan

Department of Microbiology

DEPARTMENT OF PHYSICS

Learning Outcomes		
Sr.No.	**Name of the program**	**Program outcomes**
1	**B.Sc. Physics**	**PO1**:Acquired the knowledge with facts and figures related to Physics. **PO2**:Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life. **PO3:**Acquired the skills in handling scientific instruments, performing in laboratory experiments
		Program specific outcomes
2	**B.Sc. I Physics**	**PSO1:** Attained a common level in basic mechanics, properties of matter. **PSO2:** Understood some phenomenon of optics and basic principles of LASER **POS3:**Understood the principles of heat and thermodynamics to complement the core for their future courses **POS4:** Introduced some principles of electricity, magnetism and basic electronics **PSO5:** Developed their experimental and data analysis skills through a wide range of experiments through practical at laboratories
	B.Sc. II Physics	**PSO6:** Introduced to a wide range of topics in General Physics , heat and Sound with additional relevant mathematical techniques to complement the core . **PSO7:** Understood some principles of electronics. **PSO8:** Understood the phenomenon of optics **PSO9:** Understood the principles of modern physics **PSO6:** Developed their experimental skills through a series of experiments which also illustrate major themes of the lecture courses.

Sr.No.	Name of the program	Course outcomes
3	**B.Sc. I Physics Paper I (Mechanics and properties of matter)**	**CO1:**Determine moment of inertia of a body about different axes. **CO2:** Use various types of pendulums to determine acceleration due to gravity (g) **CO3:** Describe the basics of elasticity **CO4:** Understand and determine the surface tension of liquid. **CO5**: Identify the type of flow of fluid and apply Bernoulli's theorem
	B.Sc. I Physics Paper II (Optics and Laser)	**CO6:**State Fermat's principle and explain reflection and refraction of light .Identify the type of aberration. **CO7:** Identify various parts of optical instruments (spectrometer, optical bench) **CO8:**Describe the phenomenon of Interference and diffraction of light. **CO9:** Understand basic principles of laser and describe He-Ne and Ruby lasre
	B.Sc. I Physics Paper III (Heat and Thermodynamics)	**CO10:** Understand transport phenomena associated with gas molecules. **CO11:** Describe different methods of liquefaction of gas. **CO12:** Understand basics of thermodynamics and its laws **CO13:** Describe principle of working of heat engines **CO14:** Understand principle of refrigerator
	B.Sc. I Physics Paper IV (Electricity, Magnetism and BasicElectronics)	**CO15:** Understand basics of alternating current and AC circuits. **CO16:** Understand magnetostatics and use B.G. **CO17:** Understand basic electronic components and devices. **CO18:** Explain the principles of BJT
	B.Sc. II Physics Paper V (General physics ,Heat and Sound)	**CO19:** Apply the theory of vectors **CO20:** Describe precessional motion **CO21:** Understand bending moment and theory of flat spiral spring **CO22:** Determine viscosity highly viscous liquids **CO23:** Understand concept of entropy **CO24:** Understand acoustics of buildings and reverberation time

	B.Sc II Physics Paper VI (Elctronics)	**CO25:** Understand different types of transistor amplifiers **CO26:** Understand different types of Oscillators **CO27:** Understand unipolar devices (UJT, FET) **CO28:** Understand basics of digital electronics **CO29:** Understand and use electronic instruments
	B.Sc.II Physics Paper VII (Optics)	**CO30:** Understand the lens system and draw cardinal points. **CO31:** Describe Michelson and Fabry perot interferometer **CO32**: Understand the phenomena of diffraction of light. **CO33:** Understand the term Resolving power. **CO34:** Understand the phenomena of polarization. **CO35:** Understand the principle of optical fiber
	B.Sc. II Physics Paper VIII (Modern Physics)	**CO36:** Understand theory of relativity **CO37:** Describe concept of matter waves **CO38:** Understand vector atom model **CO39:** Understand Compton effect **CO40:** Understand nuclear fission, nuclear energy and describe nuclear reactor

Head of Department
Dept. of Physics

DEPARTMENT OF ZOOLOGY

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr. No.	**Name of the program**	**Program outcomes**
1	**B Sc III -Zoology**	• Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes • Understand the issues of environmental contexts and sustainable development.
Sr. No.	**Name of the program**	**Program specific outcomes**
1	**B Sc I**	Understand the nature and basic concepts of Cell biology, Taxonomy , genetics, Ecology, applied Zoology
2	**B Sc II**	• Analyse the relationships among animal and environment, basic biochemistry • Understand the applications of Zoological sciences in Apiculture, sericulture, poultry ,dairy, fishery, goat and reproductive biology , immunology, basic histology of human
3	**B Sc III**	• Understanding and performing procedures as per laboratory standards in the areas of animal physiology, endocrinology, toxicology, Taxonomy, Economic Zoology , Ecology , embryology
Sr. No.	**Name of the program**	**Course outcomes**
	B Sc Zoology	• Learners will develop conceptual clarity with regard to the anatomy of animals at different levels. • Learners shall know the evolutionary perspective of each level of organization. Learners will know the importance of the significance and advantages of each level of organization • Learners will understand that scientific classification of animals is based on certain characteristics they have in common. Learners will be able to recall characteristics features and examples of each phylum. • . Classification , general characters, ecological significance of animal representatives of invertebrates and vertebrates
		• Learners will be able to understand the processes

		involved in embryonic development and its application
		• Learners would appreciate the well planned organization of tissues and cells in the organ systems.
		• The course will prepare learners to develop broad understanding of the different areas and significance of toxicology. Moreover, it will also develop critical thinking and assist students in preparation for employment in pharmaceutical industry and related areas.
		• Learners will be able to understand the different factors affecting environment, its impact and laws governing environmental management.

Dr. K. R. Rao
Dept. of Zoology

DEPARTMENT OF SOCIAL WORK

Program Outcomes:

The master of social work program prepares graduate students to become competent and professional social worker by inculcating human values.

It creates the respect towards diversity and makes them to work for social and economic justice as a central to their practice by seeking them to apply their knowledge, values and skills to improve human well being.

Program Specific Outcomes: (Specialization wise)

Sr. No.	Name of Specific Program	Program Specific Outcomes
1	**Human Resource Management-HRM (Gr.A)**	• Manage own professional development and provide leadership to others in the achievement of ongoing competence in human resources professional practice. • Analyze the key issues related to administering the human elements such as motivation, compensation, appraisal, career planning, diversity, ethics, and training etc.
2	**Urban and Rural Community Development-URCD (Gr.B)**	• To acquaint with community development and development practices • To comprehend with importance of modern development practices and innovative people participation strategies • Develop perspectives for critical understanding the issues and concerns of Urban , Rural and Tribal Communities
3	**Family and Child Welfare - FCW (Gr.D)**	• The programme prepares and equip the masters of social work to directly work with people, develop their capacities to conceive the concepts , principles and theories related to human development and social development in the fields of different social domains such as women , children, disadvantaged group etc and provide guidance and counseling to the target group// community. • The course has a lot of scope in government projects, educational and health care institutions and in many more local and international NGOs. • Acquire skills social work intervention with children , youth, women, disabled and aged
4	**Medical and Psychiatric Social**	• To develop skills, knowledge and values regarding medical & psychiatric issues among students.

	Work - MPSW (Gr.E)	• To create trend and professional social work in the field of health and mental health

MSW-I (Sem. I) Course Outcomes: (Subject and Unit wise)

Sr. No.	Paper No.	Name of Course (i.e.- Subject & Unit)	Course Outcomes
1	**P-I**	**Indian Society and Social Institution**	
		Unit No. 1 -	To understand the concept of society and Social Institutions.
		Unit No. 2	Develop a broad understanding of Indian society and intercultural literacy through cultural immersion
		Unit No. 3	Explain how the self develops sociologically and compare this to psychological, economic and other approaches with the help of social institutions.
		Unit No. 4	Understand and describe the primary perspectives on social stratification
		Unit No. 5	To creates law abiding citizens with human values and rights through legal education.
2	**II**	**History and Ethics of Social Work Profession**	1. To understand the historical context of social work education. 2. To comprehend the ideologies of social work. 3. To understand the western and Indian ideologies for social change.
		Unit No. 1 -	To understand the context of emergence of social work.
		Unit No. 2	To comprehend the history of social work and social education
		Unit No. 3	To know various concepts pertaining to social work.
		Unit No. 4	To envisage the ethics and code of conduct of social work.
		Unit No. 5	To understand western history of ideologies.
3	**III**		**Stages of Human Development**
		Unit No. 1 -	➢ To understand concepts of stages of the life span. ➢ To understand the role of hereditary and environment.
		Unit No. 2	➢ To be aware of personal to pubertal growth ➢ To be aware of physical, physiological, psychological, emotional and social development.
		Unit No. 3	➢ To get awareness about various concept adulthood. ➢ To get awareness of significance of neighborhood, peer, school, community, work place and other larger context of the society and culture.
		Unit No. 4	➢ To get orientation about Aging. ➢ To understand the concept of psychosocial development.
		Unit No. 5	➢ To understand the concept of Multidisciplinary

			perspectives. ➢ To understand various aspects Economic, Political, Ecological and feminist perspectives of human development
4	**IV**		**Introduction to Social Work Research**
		Unit No. 1 -	• Develop understanding about scientific approach to human inquiry
		Unit No. 2	• Acquired skills and techniques for doing research
		Unit No. 3	• Comprehend the scope and importance of social work research
		Unit No. 4	• Gain Knowledge about various steps in social Work research
		Unit No. 5	• Able to know the various tools, levels of measurement and types of sampling methods applied in social work research
5	**V**		**Introduction to Social Casework**
		Unit No. 1 -	➢ To understand basic concepts of social case work ➢ To understand the historical development of social casework.
		Unit No. 2	➢ To be aware of social functioning of social casework. ➢ To be aware of process and components of social casework.
		Unit No. 3	➢ To get awareness about tools and techniques of social casework. ➢ To get awareness of skills needed in social casework.
		Unit No. 4	➢ To get orientation about interview in social casework. ➢ To understand the importance of recording in social casework.
		Unit No. 5	➢ To understand the settings of social casework. ➢ To understand various settings: schools, family, industry health and mental health of social work.
6	**VI**		**Introduction to social group work**
		Unit No. 1 -	To enumerate the importance of group in social work practice relevant to Indian conditions
		Unit No. 2	To understand the concept of group work while working in group
		Unit No. 3	Learn the process of forming groups
		Unit No. 4	To Develop the different skills and techniques while working in groups.
		Unit No. 5	Understand about the techniques and dynamics to be followed while working in group.
7	**VII**		**Community Organization and Social action**
		Unit No. 1 -	To understand the concept of community practice
		Unit No. 2	To acquaint with the knowledge of community power structure and dynamics

		Unit No. 3	To comprehended with the knowledge of models and strategies of community organization
		Unit No. 4	To gain clarity of process and steps of community organization
		Unit No. 5	To study the relevance of community organization method across the sphere of social work

MSW-I (Sem. II) Course Outcomes: (Subject and Unit wise)

Sr. No.	**Paper No.**	**Name of Course (i.e.- Subject & Unit)**	**Course Outcomes**
1	**P-I**	**Indian Social Problems**	
		Unit No. 1 -	To prepares students for socialisation by participating in a social group by teaching them its norms and expectations for bringing social change.
		Unit No. 2	Describe the functionalist view of deviance in society and compare Durkheim's views with social disorganization theory, control theory, and strain theory
		Unit No. 3	Create awareness of social conditions through life experiences and through reports in the media
		Unit No. 4	To bring out conformity, solidarity and continuity of a particular group or society through Social Control.
		Unit No. 5	Understand degree to which, in a given society, an individual's, family's, or group's social status can change throughout the course of their life through a system of social hierarchy or mobility.
2	**II**		**Ideologies of Social Work**
		Unit No. 1 -	To understand the religious ideologies and social work.
		Unit No. 2	To comprehend the various social work approaches of social work.
		Unit No. 3	To know the contemporary ideologies of social work.
		Unit No. 4	To understand the work of social reformers and their ideologies of social change.
		Unit No. 5	To imbibe various concepts related to professional social work.
3	**III**		**Theories of Human Development**
		Unit No. 1 -	➢ To understand concepts of mind, brain and behavior ➢ To understand the concepts in health and mental health.
		Unit No. 2	➢ To be aware of personality development ➢ To be aware of various types of personality.
		Unit No. 3	➢ To understand about the process of becoming. ➢ To get awareness of self through different cognitive

			paradigms.
		Unit No. 4	➢ To get orientation of various theories of personality development. ➢ To understand the theories of learning's.
		Unit No. 5	➢ To understand the cognitive development theory. ➢ To understand humanistic theories of development.
4	**IV**		**Social Work Research and Statistics**
		Unit No. 1 -	• Acquire skills for data analysis
		Unit No. 2	• Learn SPSS for statistical analysis of the data .
		Unit No. 3	• Orient the students about application of various statistical tests or data analysis
		Unit No. 4	• Study the various steps in report writing
		Unit No. 5	• Prepare synopsis for research project
5	**V**		**Theories and Skills in Social Casework**
		Unit No. 1 -	➢ To understand basic theories in social casework ➢ To understand the defense mechanisms.
		Unit No. 2	➢ To be aware about importance of client-worker relationship in social casework ➢ To be aware of characteristics of client-worker relationship in social casework
		Unit No. 3	➢ To get awareness about basics of counseling. ➢ To get awareness of process and areas of counseling.
		Unit No. 4	➢ To get orientation about crisis. ➢ To understand the importance of crisis intervention.
		Unit No. 5	➢ To understand the concept of professional self. ➢ To understand role & qualities of social case worker.
6	**VI**		**Social Group Work and Leadership**
		Unit No. 1 -	Learn to develop values appropriate to working with groups
		Unit No. 2	Develop the skills of programme plannings and plan programs.
		Unit No. 3	Understand the importance of Leadership and develop the qualities of a leader.
		Unit No. 4	Utilize the skills in empowering the weaker sections while working in the field of social work
		Unit No. 5	To acquire skills of working with different population across a variety of settings.
7	**VII**		Community Development and Social Action
		Unit No. 1 -	To acquaint with the knowledge of community development
		Unit No. 2	To study the community development institutions and programs
		Unit No. 3	To acquaint with the knowledge of social action
		Unit No. 4	To acquaint with the knowledge of social reforms Advocacy and lobbying
		Unit No. 5	To study the social movements in India

MSW-II (Sem.III) Course Outcomes: (Subject and Unit wise)

Sr. No.	Paper No.	Name of Course (i.e.- Subject & Unit)	Course Outcomes
1	**P-I**	**Administration of Human Services Organization**	
		Unit No. 1 -	➢ To understand concepts of administration ➢ To understand welfare administration
		Unit No. 2	➢ To be aware of process of administration ➢ To be aware of human resource policy
		Unit No. 3	➢ To get awareness about concept of NGO. ➢ To get awareness of GOs and NGOs.
		Unit No. 4	➢ To get orientation about leadership. ➢ To understand the concept of team building.
		Unit No. 5	➢ To understand the concept of time management. ➢ To understand various aspects of time management.
2	**II**	**Project Management and skills in Communication**	To understand the concept of project management To Comprehend the important skills in project management
		Unit No. 1 -	To understand the concepts of project mangement
		Unit No. 2	To gain the knowledge about various concept of project life cycle
		Unit No. 3	To acquire skills by understanding the tools in project management
		Unit No. 4	Understanding the importance of skills in communication
		Unit No. 5	To gain the knowledge about various approaches n communication.
3	**III**		**Social Policy and Social Legislation-I**
		Unit No. 1 -	To acquaint with the knowledge of social policy and social legislation
		Unit No. 2	To study the historical perspectives of social policies
		Unit No. 3	To comprehend with the concept of social legislation
		Unit No. 4	To study the legal practices in social work
		Unit No. 5	To study the importance of provisions for social workers
Gr. A (HRM)			
4	**IV**	**HRM & Social Work in Industry-I**	
		Unit No. 1 -	Explain the importance of human resources and their effective management in organizations.
		Unit No. 2	Understand the organizational, societal and individual costs and benefits of training and development along with its different types.
		Unit No. 3	Justify how each area of Human Resources Information System interrelates with each other and how crucial proper design and management are to the success of the system.

		Unit No. 4	State the importance of relations in Human Resource function in planning and staffing organizational manpower requirements.
		Unit No. 5	Summarize the variety of forms that conflict in work organizations take with emphasis on conflict of interest and trying to resolve them by counseling.
5	**V**	**Personnel Management & Industrial Relations – I**	
		Unit No. 1 -	The understand basic objective of personnel management is to help the realization of the organizational goals.
		Unit No. 2	Explain fundamental concepts, principles, techniques and judgment in supply-demand forecasting and supply programs in determining HR planning.
		Unit No. 3	To understand established the rules and regulations for maintaining an equitable wage and salary system.
		Unit No. 4	Analyze core issues, policies and practices surrounding employee relations and legal issues.
		Unit No. 5	Differentiate between cooperation and management of conflict within an organization and provide strategic policies relating to the changes that occur in employer-employee relations.
6	**VI**	**Labor Welfare & Labor Laws : I**	
		Unit No. 1 -	To know how Labor Welfare helps to foster a sense of responsibility in the industry.
		Unit No. 2	To increase the standard of living of the. Working class laborer is more prone to exploitation from the capitalists if there is no standardized way of looking after their welfare.
		Unit No. 3	To learn the fair labour Standards Act to regulates employee wages and establishes the minimum wage and overtime payments.
		Unit No. 4	To Interpret; analyze the International Industrial Relation issues and performance management.
		Unit No. 5	To discuss the different labor laws and case studies pertaining to factory.
		Gr. B (URCD)	
7	**IV**		**Governance and Rural Community Development**
		Unit No. 1 -	Gain Knowledge about rural realities and problems in rural areas
		Unit No. 2	Understand the concept and significance of democratic decentralization and its impact on local self governance
		Unit No. 3	Get acquainted with various government initiatives and voluntary organizations efforts for community development
		Unit No. 4	Develop a broad understanding about the importance of cooperative societies and impact of LPG on cooperatives
		Unit No. 5	Develop an understanding about cooperative sector in India.
8	**V**		**Urban and Tribal Community Development -I**

		Unit No. 1 -	To acquaint with the knowledge of urban community
		Unit No. 2	To acquaint with the knowledge of social Institutions of urban community
		Unit No. 3	To gain clarity of tribal problems and development programs
		Unit No. 4	To comprehend the importance of urban local self governance
		Unit No. 5	To acquaint with the knowledge of urban Policies and programs related to urban development
9	**VI**		**Social Work and Ecology**
		Unit No. 1 -	To acquaint with the knowledge of ecology and environment
		Unit No. 2	to gain clarity of Human and Environmental relation and interdependency
		Unit No. 3	To comprehend the importance of Natural resources and diversity
		Unit No. 4	To understand the importance of Government role and responsibility and initiatives
		Unit No. 5	To study the environmental movements national and state
			Gr. D (FCW)
10	**IV**		**CHILD DEVLOPMENT**
		Unit No. 1 -	To develop an understanding on the concept of pre natal care and child growth .
		Unit No. 2	To get exposure to the importance of immunization programme in the life of a child as a social worker.
		Unit No. 3	Explore factors related to the beginning of the parenting needs during the various life developemental stages.
		Unit No. 4	Get acquainted towards the aspects and behavior problems of the children.
		Unit No. 5	Learn to cater to the needs / solve the problems of the beneficiaries
11	**V**	**Family and Women Development**	To understand the theories and approaches to family and social institution. To gain the knowledge about the ender issues and women development.
		Unit No. 1 -	To understand various concepts related to family and theories.
		Unit No. 2	To know the impact of various socio economic factors on family.
		Unit No. 3	Understanding various theories and prepositions of marriage
		Unit No. 4	To know various alternative family patterns
		Unit No. 5	To understand gender issues and need of women development.
12	**VI**	**Social work Intervention with Children , Youth and Aged**	
		Unit No. 1 -	Develop understanding about the needs and Problems of

			Children and Youth
		Unit No. 2	Learn the concept of Gerontology and School social work
		Unit No. 3	Gain Knowledge about various national and International agencies working efforts for children, youth and aged
		Unit No. 4	Develop holistic perspectives for social work practice in the field of child development, Youth development
		Unit No. 5	Able to understand the various policies, programmes and enactments related to Child Rights, Youth development and Aged Welfare
			Gr. E (MPSW)
13	**IV**		**Medical Social Work**
		Unit No. 1 -	➢ To understand concepts of medical social work ➢ To understand a need for medical social work in India
		Unit No. 2	➢ To be aware of concept of patient ➢ To be aware of hospitalization process
		Unit No. 3	➢ To get awareness about health care delivery system ➢ To get awareness of management of hospital
		Unit No. 4	➢ To get orientation of emergence of medical social worker ➢ To understand the roles, functions, and limitations of medical social worker
		Unit No. 5	➢ To understand the concept of multidisciplinary treatment ➢ To understand various needs of patients
14	**V**		**Preventive and Social Medicine-I**
		Unit No. 1 -	➢ To introduce basic concepts of health and disease. ➢ To understand the indicators of health and disease.
		Unit No. 2	➢ To be aware of various communicable diseases. ➢ To be aware of non-communicable diseases.
		Unit No. 3	➢ To get awareness about occupational hazards. ➢ To get awareness of food and hygiene.
		Unit No. 4	➢ To get orientation of public sector health care. ➢ To understand the private sector health care.
		Unit No. 5	➢ To understand the concept of nutrition ➢ To understand problem of Malnutrition in India.
15	**VI**		Psychiatry and Mental Health-I
		Unit No. 1 -	➢ To introduce basic concepts in field of Psychiatry ➢ To understand the DSM and ICD classification.
		Unit No. 2	➢ To be aware of various concepts in psychiatric history taking (MSE). ➢ To be aware of neurosis and psychosis.
		Unit No. 3	➢ To get awareness about childhood psychiatric disorders ➢ To get awareness of psycho-somatic disorders
		Unit No. 4	➢ To get orientation of personality disorders. ➢ To understand major psychotic disorders.
		Unit No. 5	➢ To understand the concept of geriatrics

			➢ To understand problems of organic brain disorders.

MSW-II (Sem.IV) Course Outcomes: (Subject and Unit wise)

Sr. No.	Paper No.	Name of Course (i.e.- Subject & Unit)	Course Outcomes
1	**I**	**Social Welfare Administration**	
		Unit No. 1 -	➢ To understand basic concepts of human resource development ➢ To understand a need for performance appraisal.
		Unit No. 2	➢ To be aware of concept of organizational effectiveness. ➢ To be aware of basic managerial skills.
		Unit No. 3	➢ To get awareness about civil society organizations ➢ To get awareness of corporate social responsibility.
		➢ **Unit No. 4**	➢ To get orientation of major legal provisions applicable to NGOs, Trusts. ➢ To understand the importance of public relations.
		Unit No. 5	➢ To understand the concept of financial administration ➢ To understand social audits for organizations.
2	**II**	**Project Implementation and Communicational Media**	➢ To understand the concept of project development. ➢ To gain the knowledge about project implementation. ➢ To get acquainted with various communicational media.
		Unit No. 1 -	➢ To understand the process of project development
		Unit No. 2	➢ To know the importance of project implementation.
		Unit No. 3	➢ To understand the organizational communication and planning.
		Unit No. 4	➢ To gain knowledge about various audio video media.
		Unit No. 5	➢ To know various skills in communication.
3	**III**		**Social Policy and Social Legislation-II**
		Unit No. 1 -	To acquaint with the knowledge of social policy and planning
		Unit No. 2	To study the linkage between social policy and planning
		Unit No. 3	To acquaint with five years plans and progrmms
		Unit No. 4	To study the legislation related to health
		Unit No. 5	To study the legislation related to community development
			Gr. A (HRM)
4	**IV**	**HRD & Social Work in Industry-II**	
		Unit No. 1 -	➢ Learn the cost-benefit analysis of HRD and its sub-system.
		Unit No. 2	Define, describe how to support and/or control change and Initiate and respond to change by understanding industrial

			psychology.
		Unit No. 3	Explain, evaluate the main practices and process of Organizational Development
		Unit No. 4	Outline the nature and sources of conflict and explain the different strategies and approaches used in the resolution of conflict.
		Unit No. 5	State the need and significance of CSR for the benefits of employers, employees and community as well as govt.
5	**V**	**Personnel Management & Industrial Relations – II**	
		Unit No. 1 -	Define the concept of performance management and outline its role in contemporary organizations.
		Unit No. 2	Develop the ability to use different performance management techniques by the means of personnel audit and research.
		Unit No. 3	Interpret analyze the mechanisms of Industrial relation issues and performance management.
		Unit No. 4	To learn about safeguard security of tenure and improve conditions of service through trade union.
		Unit No. 5	To suggest ways of responsive co-operation in improving levels of production and productivity, discipline and high standards of quality.
6	**VI**	**Labour Welfare & Labour Laws : II**	
		Unit No. 1 -	To increase the aspects standard of living of the by working class.
		Unit No. 2	To protect the employees and their family members by providing social security mechanism.
		Unit No. 3	To learn about minimum wages act, payment of wages act and payment of bonus act.
		Unit No. 4	To know how to safeguard employee by proving PF, gratuity and pension scheme.
		Unit No. 5	To develop understanding about ESI act, compensation act, maternity benefit acts and mathadi act and its amendment.
Gr. B (URCD)			
7	**IV**	**Strategies and Trends in Rural Community Development**	
		Unit No. 1 -	Gain insight about importance of peoples participation in rural development
		Unit No. 2	Learn concept and process of five year plan
		Unit No. 3	Understand the development of different approaches in rural development
		Unit No. 4	Study the role of social work practice in rural community development
		Unit No. 5	Understand the impact of LPG on rural community.
8	**V**	**Strategies And Approaches For Tribal And Urban Community Development**	

		Unit No. 1 -	To acquaint with the knowledge of socialization and tribal society
		Unit No. 2	To study the problems of tribal community
		Unit No. 3	To study the programs and strategies related to tribal development
		Unit No. 4	To study the policies affecting the tribal community
		Unit No. 5	To understand the working of NGS and civil societies working for urban community development
9	**VI**		**Disaster Management**
		Unit No. 1 -	To understand the concept of disaster and its types
		Unit No. 2	To acquaint with the knowledge of impact of disaster on communities
		Unit No. 3	To study the disaster management cycle and management
		Unit No. 4	To study the policy issues involved in disaster management
		Unit No. 5	To study the role and initiatives of government and NGOs in disaster management
Gr. D (FCW)			
10	**IV**		**CHILD WELFARE SERVICES**
		Unit No. 1 -	To gain knowledge on the various policies for children established by the government.
		Unit No. 2	To get exposure to Child Rights which are a component of human rights
		Unit No. 3	To understand the current concerns with regard to child rights in various fields.
		Unit No. 4	To know the child related laws and policies and to ameliorate the conditions of children in India.
		Unit No. 5	To gain knowledge about the schemes advocating child protection in India.
11	**V**	**Family Issues and Social Work Intervention**	To understand the various legislations pertaining to family and marriage. To know the policies and programmes related to family and women and development. To acquire knowledge and skills regarding social work interventions in family setting.
		Unit No. 1 -	To know the concepts and programmes of family life education
		Unit No. 2	To gain the understanding of population policy.
		Unit No. 3	To gain the conceptual understanding of family violence and its implications.
		Unit No. 4	To know various legislations related to family and marriage.
		Unit No. 5	To understand the ideologies related family, international and national policies and programmes.
12	**VI**		**Social Work Intervention with Women and Disabled**
		Unit No. 1 -	Strengthen the professional competency of social work practice with women and disabled

		Unit No. 2	Gain greater understanding about the concept of gender equality and women empowerment
		Unit No. 3	Able to analyse the situation of girl child and women in India
		Unit No. 4	Get acquainted with the efforts of different voluntary agencies and government in the field of women development and Rights of the disabled
		Unit No. 5	Acquire various skills for social work intervention with women and disabled
			Gr. E (MPSW)
13	**IV**		**Psychiatric Social Work**
		Unit No. 1 -	➢ To understand concepts of psychiatric social work ➢ To understand a need for psychiatric social work in India
		Unit No. 2	➢ To be aware of emergence of psychiatric social work ➢ To understand the roles, functions, and limitations of psychiatric social worker
		Unit No. 3	➢ To get awareness about concept and need of counseling. ➢ To get orientation of various behavior therapies.
		Unit No. 4	➢ To get orientation of CBT and REBT. ➢ To understand the humanistic therapies.
		Unit No. 5	➢ To understand applications of therapies in different settings and issues. ➢ To address psycho-social issues through psycho-therapies.
14	**V**		Preventive and Social Medicine-II
		Unit No. 1 -	➢ To understand family planning and its scope. ➢ To understand sociology involved in family planning.
		Unit No. 2	➢ To be aware of MCH services. ➢ To understand child related health, human rights issues.
		Unit No. 3	➢ To get awareness about care and rehabilitation. ➢ To get orientation of various GOs and NGOs efforts in the field of disability care and rehabilitation.
		Unit No. 4	➢ To get orientation of health education and promotion ➢ To understand approaches of health education and promotion.
		Unit No. 5	➢ To understand legal aspects of general health. ➢ To get orientation of medico-legal offences.
15	**VI**		Psychiatry and Mental Health-II
		Unit No. 1 -	➢ To introduce basic concepts of mental health. ➢ To understand the prevalence of CMD.
		Unit No. 2	➢ To be aware of various laws related to mental health ➢ To be aware of mental health policy.
		Unit No. 3	➢ To get awareness about level of preventions in mental health ➢ To get awareness of relation between civil society and

			mental health
		Unit No. 4	➢ To get orientation of mental health education. ➢ To understand the need of promotion of mental health education
		Unit No. 5	➢ To understand different models of mental health education ➢ To understand different models of mental health intervention

Head of Department

Department of M.S.W

DEPARTMENT OF BIOTECHNOLOGY (B.SC.)

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr.No.	**Name of the program**	**Program outcomes**
1	**B Sc III - Biotechnology**	• To attain the capability to employ in independent and life-long learning in the broadest context socio-technological changes and use recent techniques betterment of mankind • Understand the issues of environmental, pharmaceutical, agricultural, medicinal, industrial contexts and uphold development. • To inculcate research attitude among the students • To initiate skill oriented entrepreneur leadership
Sr.No.	**Name of the program**	**Program specific outcomes**
1	**B Sc I Biotechnology**	Understand the nature and basic concepts of Cell biology, Taxonomy , genetics, Ecology, Animal and plant development, Biostatistics, Computer science, Biochemistry and metabolism, Chemical and physical science, Microbiology
2	**B Sc II**	• Acquaint the students with new techniques in the field of animal, plant, microbial genetics and basic Immunology and immune-techniques • Acquaint the students with biochemical techniques used to isolation, screening use plant and animal extracts
3	**B Sc III**	• Understand the applications of Biotechnology and genetics in Agriculture, Pharmaceuticals, Medicine, food industries, Apiculture, sericulture, poultry ,dairy, fishery, goat and reproductive biology , immunology • Acquaint the students with the processes and standard procedures in the industries
Sr. No.	**Name of the program**	**Course outcomes**
	B Sc Biotechnology	• Learners will develop conceptual clarity with regard to the new ideas in the genetic engineering. • Learners shall know the importance of enzymes. Learners will know the importance of the

		significance and advantages of each each industrially important enzyme isolated from plants, animals and microbes. • Learners will understand that scientific use of microorganism and GMOs. Learners will be able to recall applications and uses of GM plants and animals.
		• Learners will be able to understand the processes involved in developmental processes and its genetics and its application
		• Learners would appreciate the well planned organization of animal and plant tissue culture systems.
		• The course will prepare learners to develop broad understanding of the different areas and significance of genetic engineering, food and dairy technology, bioinformatics, drug designing, nanotechnology. Moreover, it will also develop critical thinking and assist students in preparation for employment in pharmaceutical, food, diary, agricultural, medicinal industry and related areas.
		• Learners will be able to understand the different issues regarding GMOs, patenting, its impact and laws governing environmental safety and management.

Dr. N. B. Patkar
Dept. of Biotechnology

DEPARTMENT OF BIOTECHNOLOGY (M.SC.)

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr. No.	**Name of the program**	**Program outcomes**
1	**M. Sc Biotechnology**	• Programme outcome of M. Sc Biotechnology is to produce competent biotechnologist's who can employ and implement their knowledge base in premium processes and applications which will profoundly influence or utilized for existing paradigm of agriculture, industry, healthcare and restoration of degraded environment to provide sustainable competitive edge to present society. • Students will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in various sectors of pharmaceutical and biotechnological industry. • Understand the foundational concepts of molecular biology, and how these impact biotechnology research and development in the diverse fields that span healthcare and agriculture. • To inculcate research attitude among the students • To initiate skill oriented entrepreneur leadership
Sr. No.	**Name of the program**	**Program specific outcomes**
1	**M. Sc Biotechnology**	• Students will be able design, conduct experiments, analyze and interpret data for investigating problems in Biotechnology and allied fields. • Higher studies (M. Phil, Ph. D) can be pursued in order to attain research positions. Various examinations such as CSIR-NET, GATE, ICMR, DBT and many other opens channels for promising career in research. • Some of the major pharmaceutical and drug companies' highering biotechnological professionals include Ranbaxy, Hindustan Lever and Dr Reddy's Labs, food processing industries, chemical industry and textile industry as well. Beside this industries also employ bio-technological professionals in their marketing divisions to boostup business in sectors where their products would be required.

		• Entrepreneurship ventures such as consultancy and training centres can be opened. • Beside industrial sector there are ample opportunities in academics as well. • Several career opportunities are available for students with biotechnology background abroad especially in countries like Germany, Australia, Canada, USA and many more where biotechnology is a rapidly developing field.
Sr. No.	**Name of the program**	**Course outcomes**
	M. Sc I Biotechnology Sem-I	**Microbiology** • This course will aid students to acquire skills and competency in microbiological laboratory practices applicable to microbiological research or clinical methods, including accurately reporting observations and analysis. • Students will gain awareness about the microbes present in the environment and their impact
		Concept of Biochemistry • Students will be imparted complete knowledge about structure and function of different biomolecules (proteins, lipids, nucleic acids, and carbohydrates) found in living cells. • Also the course will provide the knowledge how biomolecules are synthesized and metabolized inside living cells.
		Inheritance Biology • After completing the course on inheritance complete knowledge as how genes are transmitted in plants and animals from one generation to another will be imparted. • Along with this, the course will highlight the role of genetics / mutations in animal and plant breeding.
		Biostatistics and Bioinformatics • The primary goal of this course is to uncover how various tools and techniques of bioinformatics can be utilized in studies pertaining to macromolecules (DNA, RNA, protein). • After completing this course students will be able to analyze, interpret and study biological data (sequence, structure, etc) stored in various databases

		available on internet.
	Sem-II	**Cell Biology** • In particular, this course will focus on different attributes of living cells, how cells are formed, how cells interact along with the cell adhesion and cellular signaling. • Specific knowledge will be imparted about role of cell division and its regulation on diseases like cancer.
		Enzyme technology • Upon successful completion of this course, the student will learn the major classes of enzyme and their functions in the cell. • The course also provides information pertaining to role of co-enzyme cofactor in enzyme catalyzed reaction, properties of enzymes and regulation of biochemical pathways. • Differentiate between equilibrium and steady state kinetics and analyzed simple kinetic data and estimate important parameter (Km. Vmax, Kcat etc).
		Molecular Cell Processing • Course on molecular cell processing will enhance the knowledge base about functional and structural organization of nucleic acid. • The course particularly aims at understanding structure, synthesis and replication of nucleic acids.
		Immunology and Immunotechniques • The course will provide technical knowledge as to how different diseases are caused and various responses mediated by living cells to combat pathogen attack. • At The course will provide sound knowledge of how immune system deals with various pathogens, different processes and cell types involved in prevention of disease. • Along with this the students will become aware about concept, synthesis and action mechanism of vaccines
	M. Sc II Biotechnology Sem-III	**Industrial and Environmental Biotechnology** • Learning outcome of Environment Biotechnology is to describe existing and emerging technologies that are important in the area of environment and the principles and techniques which underline the application of biosciences, address environmental issues including pollution, mineral resource, renewable energy and water recycling.

		• Course will have a specific focus on bioremediation and treatment of polluted effluent. • The course will also provide conceptual knowledge and significance of genetically modified microbes
		Genetic Engineering • Learning outcomes of this course are technical know-how on versatile techniques in recombinant DNA technology. • An understanding on application of genetic engineering techniques in basic and applied experimental biology and proficiency in designing and conducting experiments involving genetic manipulation. • The course will provide techniques involved in production of transgenic plants and animals and their pros and cons.
		Plant Biotechnology • The student will acquire knowledge about the range of approaches to manipulate and improve plants. • Students will demonstrate the ability to develop, interpret, and critically evaluate modern approaches to scientific investigation in field of agriculture.
		Computational structure biology & Drug designing • This course offers the students comprehensive information and insights in understanding disease mechanism through biomolecular. • The students will gain an understanding in both scientific knowledge of designing and developing navel drug for emerging diseases, and business challenges in biopharmaceutical companies, including regulatory issues.
	Sem-IV	**Animal biotechnology & Stem cell technology** • The course is designed to give students a perspective on recent advances in Animal Biotechnology. Students will get familiarized with the different approaches to generate transgenic animals for various applications. • The concept of transfer of new genes in animal cells and animal cloning along with gene therapy and its significance will be imparted to the students. • To know how stem cells are utilized in medical applications.
		Advanced analytical Techniques • Upon successful completion, students will have the knowledge and skills to explain the theoretical

		aspects of key analytical techniques and instruments used in industries including electron microscopy, X-ray diffraction, mass spectrometry and spectroscopy. • Strategically plan analytical campaigns to apply to different types of samples and research objectives, including selection of the most appropriate technique/instrumentation for the students' research project. • Undertake the correct sample preparation and characterization prior to analysis by the chosen techniques or instruments. • Design an analytical work-flow to acquire data and achieve the research objectives of their project.
		Research Methodology and IPR • Course on research methodology will provide knowledge base as to how to design a research project and about different aspects involved in carrying out research. • Students will learn the methods of sampling, reviewing a research objective, conducting experiments and interpretation of results. • The concept of patent, forms of patent and patent procedures in India.
		Medical Biotechnology and Bio-nanotechnology • To enlighten the knowledge of the Students on different areas of Medical Biotechnology. • To train the Students in a hospital based setup and familiarize them with the clinical diagnostics of diseases. • To make Students acquainted with the fundamental concepts of nanotechnology and develop an understanding to employ its principles in modern biotechnology applications.
		Dissertation • This course will include allotment of an individual research work to each student to be carried out in fourth semester. • This will not only enhance knowledge base of students but also provide them exposure as to how to conduct and carry out a research based task. • Students will also learn how to compile and interpret results.

Dr. N. B. Patkar
Dept. of Biotechnology

DEPARTMENT OF BIOINFORMATICS

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr. No.	**Name of the program**	**Program outcomes**
1	**M. Sc Bioinformatics**	• This course will provide the knowledge of bioinformatics to interpret the rapidly expanding amount of biological information & discuss the basic concepts of bioinformatics and focus how to identify, seek, establish, maintain and exchange research information in biology. • Students will exhibit contemporary knowledge in developing new and more accurate algorithms and the development of High Performance Computing coupled with DNA sequencing, serial analysis of gene expression, microarrays, and new mass spectrometry • Understand the foundational concepts & review the major scientific databases needed for research problems in biology. • To inculcate scientific temperament among the students.
Sr. No.	**Name of the program**	**Program specific outcomes**
1	**M. Sc Bioinformatics**	• Students will be able to access several open resources in the form of biological databases and tools for the analysis of experimentally generated biological data and will also be equally capable to develop high throughput databases and many tools to be applied in bioinformatics. • Higher studies (M. Phil, Ph. D) can be pursued in order to attain research positions. Various examinations such as CSIR-NET, GATE, ICMR, ICAR, DBT & BINC and many other opens channels for promising career in research. • Employment opportunities in various industries in the applied aspects of Biotechnology, Microbiology, Molecular biology, Pharma & Biopharma, Drug discovery and Drug design Information technology and Healthcare IT. • Ample opportunities to take up consultancy and contract research in the field of biology for the management and analysis of molecular data.

		• Several career opportunities are available for students with bioinformatics background abroad especially in Europe, USA, Japan and Malaysia.
Sr. No.	**Name of the program**	**Course outcomes**
	M. Sc I Bioinformatics	• In particular, this course will focus on different attributes of living cells, how cells are formed, how cells interact along with the cell adhesion and cellular signaling. • The course will introduce the basic concepts of genetics and much molecular process including central dogma of molecular biology. • This course will aid students to acquire skills and competency in microbiological laboratory practices applicable to microbiological research or clinical methods, including accurately reporting observations and analysis. • Students will gain awareness about the microbes present in the environment and their impact. • The primary goal of this course is to uncover the basic and advanced tools and biological databases to the students and make them familiar with the same. • The course also introduces students with the concepts of basic and object oriented computer programming languages and their respective applications in biological sciences. • Students will be imparted complete knowledge about structure and function of different biomolecules (proteins, lipids, nucleic acids, and carbohydrates) found in living cells. • The course will provide sound knowledge of how immune system deals with various pathogens, different processes and cell types involved in prevention of disease. • An understanding on application of genetic engineering techniques in basic and applied experimental biology and proficiency in designing and conducting experiments involving genetic manipulation.
	M. Sc II Bioinformatics	• This course offers the students comprehensive information and insights in understanding disease mechanism through biomolecular. • The students will gain an understanding in both scientific knowledge of designing and developing

		navel drug for emerging diseases, and business challenges in biopharmaceutical companies, including regulatory issues. • Upon successful completion, students will have the knowledge and skills to explain the theoretical aspects of key analytical techniques and instruments used in industries including electron microscopy, X-ray diffraction, mass spectrometry and spectroscopy. • Students will be able to learn and create, retrieve, update and manage biological data using Structure Query language and oracle application programming languages in DBMS. • Students will be able to learn molecular and computational modeling and molecular simulations to study the behavior of molecules, molecular systems ranging from small chemical systems to large biological and material assemblies. • Course on research methodology will provide knowledge base as to how to design a research project and about different aspects involved in carrying out research. • Students will learn the methods of sampling, reviewing a research objective, conducting experiments and interpretation of results. • The concept of patent forms of patent and patent procedures in India. • Students will gain the knowledge of informatics applied in healthcare or individual health, pathology and health information system. • Application of bioinformatics in chemistry, immunology, personalized medicine, genomics, proteomics, metabolomics, interactomics and nano sciences. • This course will include allotment of an individual research work to each student to be carried out in fourth semester. • This will not only enhance knowledge base of students but also provide them exposure as to how to conduct and carry out a research based task. • Students will also learn how to compile and interpret results.

Mr. V. P. Sinoorkar
Dept. of Bioinformatics

DEPARTMENT OF GENETICS

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr. No	**Name of Program**	**Program out come**
1	**M.Sc. Genetics**	• To Inculcate research values among the students • Understand the issues of agricultural, genetic disorder, environmental, pharmaceutical, medicinal, industrial contexts and uphold development. • To increase awareness about genetic diseases and genetic counselling to prevent genetically transfer of diseases • Learners will be able to understand the genetical processes involved in animal and plant development and its application.
Sr. No	**Name of Program**	**Program specific outcomes**
1	**M.Sc. Genetics**	• To Increase the capability to employ in independent sector , in national, international genetic institutes and life-long learning in the broadest context socio-technological changes and use recent techniques betterment of mankind • Learners will develop conceptual clarity with regard to the new ideas in the Plant breeding and tissue culture, genetic engineering, Genetic disorders. • Learners shall know the importance of genes and their involvement in plant breeding and in development of new disease free plant variety. • Learners will know the importance of the significance and advantages of each industrially important enzyme isolated from plants, animals and microbes. • Learners will understand scientific use of microorganisms and Genetically Modified Organisms. • Learners will be able to recall applications and uses of Genetically Modified plants and animals. • Learners will understand Genetic modifications behind disease like Cancer and other inherited diseases.
		• Learners would appreciate the well planned organization of animal and plant tissue culture systems.
		• The course will prepare learners to develop broad ,understanding of the different areas and significance of genetic engineering,

		Agriculture and seed technology, cancer genetics, various genetical disorders, bioinformatics, drug designing, nanotechnology. Moreover, it will also develop critical thinking and assist students in preparation for employment in national and international agricultural research institutes, cancer research, pharmaceutical, medicinal industry and related areas
		• Learners will be able to understand the different issues regarding Genetically Modified plants and animals, patenting, its impact and laws governing environmental safety and management.
Sr. No	**Name of Program**	**Course Outcome**
1	**M.Sc. I Genetics**	• Understand the nature and basic concepts of Mendelian Genetics, inheritance biology, plant and animal genetics, Biostatistics and population genetics, Cytogenetic and Genome Organization, Cellular and Molecular Biology, • Acquaint the students with Clinical Bioinformatics, Regulation of gene expression and developmental, Biochemistry Advanced microbial genetics, Industrial and Environmental Biotechnology, Plant breeding and Tissue culture, Computational Structure Biology and Drug designing
2	**M.Sc. II Genetics**	• Acquaint the students with new techniques in animal, plant, microbial genetics, Cancer genetics, basic Immunology and immune techniques, Molecular medicine, Advance pharmaceutics, Medical biotechnology and bio-nanotechnology • Acquaint the students with biochemical techniques used to isolation, screening and use of plant and animal extracts in gene sequencing, agriculture and seed technology

Dr. Archana S. injal
Dept. of Genetics

DEPARTMENT OF NANOTECHNOLOGY

Program outcomes, program specific outcomes and course outcomes for all programs		
Sr.No.	**Name of the program**	**Program outcomes**
1	**M.Sc II - Nanotechnology**	Upon successful completion of this course students will be able to explain methods of fabricating nanostructures. Relate the unique properties of Nanomaterials to reduce dimensionality of the material. Describe the tools for properties of nanostructures and discuss various applications of Nanomaterials and implications of health and safety related to Nanomaterials. On successful completion of this course, students would have the skills and knowledge to: 1. Explain the fundamental principles of nanotechnology and their application to various fields. 2. Apply Biological and physical concepts to the Nano-scale and Nano domain. 3. Identify and compare state-of-the-art nanofabrication methods and perform a critical analysis of the research literature. 4. Design processing conditions to engineer functional Nanomaterials. 5. Evaluate current constraints, such as regulatory, ethical, political, social and economical, issues encountered in living systems.
Sr.No.	**Name of the program**	**Program specific outcomes**
1	**M.Sc. I Nanotechnology**	Understand the nature and basic concepts of fundamental of Nanotechnology in Physics, Chemistry, Biotechnology, nano medicine. To understand the concept of nanomaterial fabrication, properties of Nanomaterials, characterization tools of Nanomaterials and various nanoforms carbon.
2	**M.Sc. II Nanotechnology**	This programme aims to develop awareness & knowledge of different organizational requirement and subject knowledge through varied subjects and training methodology in students. To inculcate the students capability to work as entrepreneurs and techno managers with strong ethics and communication skills. The

		specific outcome includes training the students to take up wide variety of roles like researchers, scientists, consultants, entrepreneurs, academicians, and industry leaders. And finally, to equip students to pursue higher education and research in reputed institutes at national and international level.
Sr.No.	**Name of the program**	**Course outcomes**
	M.Sc. Nanotechnology	Upon successful completion of this course students will be able to explain methods of fabricating nanostructures. Relate the unique properties of Nanomaterials to reduce dimensionality of the material. Describe the tools for properties of nanostructures and discuss various applications of Nanomaterials and implications of health and safety related to Nanomaterials. On successful completion of this course, students would have the skills and knowledge to: 1. Explain the fundamental principles of nanotechnology and their application to various fields. 2. Apply Biological and physical concepts to the Nano-scale and Nano domain. 3. Identify and compare state-of-the-art nanofabrication methods and perform a critical analysis of the research literature. 4. Design processing conditions to engineer functional Nanomaterials. 5. Evaluate current constraints, such as regulatory, ethical, political, social and economical, issues encountered in living systems.

Dr. Mahesh C Partapure
Dept. of Nanotechnology