

Sanjivani Rural education society's
Sanjivani arts, Commerce and Science College,
Kopargaon

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Department of Botany

Course Outcome

Semester	Course Code	Course Name	Course Objectives
I	BO 111	Plant life and utilization I	<ol style="list-style-type: none"> 1. To know about the origin and evolution of life, formation of earth in the universe and existence of life on earth. 2. To gain knowledge on Algae for growing the populations with lot of Economic importance as food, fodder and feed etc.
I	BO 112	Plant morphology and Anatomy	<ol style="list-style-type: none"> 1. The learners will be made aware of definition, descriptive and interpretative morphology so as to distinguish the plant forms. 2. Students will acquire knowledge on different morphological features like, fruit, flower, inflorescences their types and distinguishing features. 3. The learner will also have a deep understanding of anatomical features, types of tissues and its organization in the plant body with special emphasis on its role and functions. 4. These learning points will help the student in further applied aspects of the subjects during their higher studies. 5. The course will also develop their thinking ability to identify and let know the knowhow and importance of the plants to wider societal reach.
II	BO 121	Plant life and utilization II	<ol style="list-style-type: none"> 1. Students will be made aware of plant diversity in Pteridophytes, Gymnosperms and Angiosperms with reference to vascular plants 2. The student will understand the role of these groups with detailed understanding of their life cycles, and applications. 3. The learners will be acquainted with understanding of application and uses of such plants in utilization.
II	BO 122	Principles of plant science	<ol style="list-style-type: none"> 1. The learner will understand the physiological processes in the plants. 2. The students will get acquainted with different cellular functions and processes of cell division 3. The learners will get knowledge of the subatomic molecules and their role and functions in the cell. 4. The course will create an applied interest of the students in the subject and will provoke to consider research as one of the potential field as career.
III	BO 231	Taxonomy of Angiosperms and Plant Ecology	<ol style="list-style-type: none"> 1. To study vegetative and floral morphology of angiospermic plants 2. To study the status of angiospermic plant kingdom 3. To study the origin of angiosperm with respect to age and probable ancestors



III	BO 232	Plant Physiology	<ol style="list-style-type: none"> 1. To study the growth pattern of plant 2. To know the phenomenon of photoperiodism and effect of phytochrome on flowering 3. To study the vernalization process 4. To know the path of translocation
V	BO 351	Algae and Fungi	<ol style="list-style-type: none"> 1. To study salient features of cryptogamic plants. 2. To make students aware about the status of cryptogams as a group in plant kingdom. 3. To study the life cycles of selected genera. 4. To study economic and ecological importance of cryptogamic plants.
V	BO 352	Archegoniate	<ol style="list-style-type: none"> 1. To Know the salient features of Cryptogams plants. 2. Know the status of cryptogams as a group in plant kingdom. 3. Understand the life cycles of selected genera. 4. Learn about the economic and ecological importance
V	BO 353	Spermatophyta and Paleobotany	<ol style="list-style-type: none"> 1. To study Gymnosperms with respect to distinguishing characters, comparison with Angiosperms, and classification. 2. To study the life cycles of Pinus and Gnetum. 3. To study the scope of Paleobotany, types of fossils and geological time scale. 4. To study the various fossil genera representing different fossil groups.
V	BO 354	Plant Ecology	<ol style="list-style-type: none"> 1. To Understand plant communities and ecological adaptations in plants Learn about biodiversity and its conservation 2. Study botanical regions of India and different vegetation types.
V	BO 355	Cell and Molecular Biology	<ol style="list-style-type: none"> 1. To study molecular biology in relation to genetic material, its inheritance, modification, replication 2. To study the mitochondria and chloroplast DNA 3. To study transcription, translation post translation modification of protein. 4. To study gene regulation in prokaryotes and eukaryotes.
V	BO 356	Genetics	<ol style="list-style-type: none"> 1. To introduce the students with "Science of Heredity" 2. To study linkage and crossing over
V	BO 3510	Medicinal Botany	<ol style="list-style-type: none"> 1. Know about history and relevance of herbal drugs in Indian system of medicine 2. Learn the macroscopic and microscopic characters, chemical constituents, adulterants, therapeutical and pharmaceutical uses of medicinal plants 3. Understand the techniques for drug evaluation (Chemical, Physical and Biological), Phytochemical investigations, standardization and quality control of herbal drugs 3. Know the technique of medicinal gardening - Cultivation practices, marketing and utilization of selected medicinal plant



			6. Develop the skills for employment or entrepreneurship.
VI	BO 366	Plant Breeding and Seed Technology	<ol style="list-style-type: none"> 1. To introduce the student with science of plant breeding 2. To introduce the student with branch of plant breeding for the survival of human being from starvation. 3. To study the techniques of production of new superior crop varieties.
VI	BO 3610	Nursery and Gardening Management	<ol style="list-style-type: none"> 1. Students would have an understanding of How nursery of the plants is prepared? 2. How rooting is promoted in the stem cuttings? 3. How seeds are stored and what are the soil conditions for seed sowing and seedling growth? 4. How landscaping is designed?
VI	BO 3611	Biofertilizers	<ol style="list-style-type: none"> 1. To introduce application of Biofertilizer technology in Agriculture 2. To familiarize students with microbes used as biofertilizers 3. To demonstrate the low cost media preparation and cultural practices in biofertilizers 4. To aware the students about benefits of applications of biofertilizers 5. To create self employment opportunities among the students



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F.Y. B. Com. Degree course (CBCS-2019)

F.Y.B.Com Semester

Semester	Course Code	Course Name	Objective of the Course
F.Y.B.Com I	111	Compulsory English- I	<ol style="list-style-type: none">1. To offer relevant and practically helpful pieces of prose and poetry to students so that they not only get to know the beauty and communicative power of English but also its practical application2. To expose students to a variety of topics that dominate the contemporary socioeconomic and cultural life3. To develop oral and written communication skills of the students so that their employability enhances4. To develop overall linguistic competence and communicative skills of students
F.Y.B.Com I	112	Financial Accounting - I	<ol style="list-style-type: none">1. To impart knowledge of basic accounting concepts2. To create awareness about application of these concepts in business world3. To impart skills regarding Computerized Accounting4. To impart knowledge regarding finalization of accounts of various establishments.
F.Y.B.Com I	113	Business Economics- I	<ol style="list-style-type: none">1. To impart knowledge of business economics2. To clarify micro economic concepts3. To analyze and interpret charts and graphs4. To understand basic theories, concepts of micro economics and their application
F.Y.B.Com I	114 (A)	Business Mathematics and Statistics - I	<ol style="list-style-type: none">1. To introduce the basic concepts in Finance and Business Mathematics and Statistics2. To familiar the students with applications of Statistics and Mathematics in Business3. To acquaint students with some basic concepts in Statistics.4. To learn some elementary statistical methods for analysis of data.5. The main outcome of this course is that the students are able to analyze the data by using some elementary statistical methods



F.Y.B.Com I	115 - B	Banking and finance (Fundamentals of Banking I)	1.To provide knowledge of fundamentals of Banking 2.To create awareness about various banking concepts 3. To conceptualize banking operations.
F.Y.B.Com I	116 - C	Marketing & Salesmanship (Fundamentals of Marketing)	1. To introduce the basic concepts in Marketing. 2. To give the insight of the basic knowledge of Market Segmentation and Marketing Mix 3. To impart knowledge on Product and Price Mix. 4. To establish link between commerce, business and marketing. 5. To understand the segmentation of markets and Marketing Mix. 6. To enable students to apply this knowledge in practicality by enhancing their skills in the field of Marketing.
F.Y.B.Com I	117	Additional English	1. To expose students to a good blend of old and new literary extracts having various themes that are entertaining, enlightening and informative so that they realize the beauty and communicative power of English 2. To make students aware of the cultural values and the major problems in the world today 3. To develop literary sensibilities and communicative abilities among students

F.Y. B. Com. Degree course (CBCS)

F.Y.B.Com Semester II

Semester	Course Code	Course Name	Objective of the Course
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F.Y.B.Com I	111	Compulsory English- II	<ol style="list-style-type: none"> 1. To offer relevant and practically helpful pieces of prose and poetry to students so that they not only get to know the beauty and communicative power of English but also its practical application 2. To expose students to a variety of topics that dominate the contemporary socioeconomic and cultural life 3. To develop oral and written communication skills of the students so that their employability enhances
F.Y.B.Com II	122	Financial Accounting- II	<ol style="list-style-type: none"> 1. To impart knowledge of various software used in accounting 2. To impart knowledge about final accounts of charitable trusts 3. To impart knowledge about valuation of intangible assets 4. To impart knowledge about accounting for leases
F.Y.B.Com II	123	Business Economics (Micro) - II	<ol style="list-style-type: none"> 1. To impart knowledge of business economics 2. To clarify micro economic concepts 3. To analyze and interpret charts and graphs 4. To understand basic theories, concepts of micro economics and their application
F.Y.B.Com II	124 (A)	Business Mathematics and Statistics - II	<ol style="list-style-type: none"> 1. To introduce the basic concepts in Finance and Business Mathematics and Statistics 2. To familiar the students with applications of Statistics and Mathematics in Business 3. To acquaint students with some basic concepts in Statistics.
F.Y.B.Com II	125(B)	Banking and Finance FUNDAMENTALS OF BANKING – II	<ol style="list-style-type: none"> 1. To develop the working capability of students in banking sector 2. To Make the Students aware of Banking Business and practices. 3. To enlighten the students regarding the new concepts introduced in the banking system.
F.Y.B.Com II	126 (C)	Marketing and Salesmanship- Fundamental of Marketing- II	<ol style="list-style-type: none"> 1. To introduce the concept of Salesmanship. 2. To give insight about various techniques required for the salesman. 3. To inculcate the importance of Rural Marketing. 4. To acquaint the students with recent trends in marketing and social media marketing.
F.Y.B.Com I	117	Additional English II	<ol style="list-style-type: none"> 1. To expose students to a good blend of old and new literary extracts having various themes that are entertaining, enlightening and



			<p>informative so that they realize the beauty and communicative power of English</p> <p>2. To make students aware of the cultural values and the major problems in the world today</p> <p>3. To develop literary sensibilities and communicative abilities among students</p>
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S.Y. B. Com. Degree course (CBCS)
S. Y. B. Com. (Semester III) (2019 Pattern)

Semester	Course Code	Course Name	Objective of the Course
S. Y. B. Com. (Semester III)	231	Business Communication-I	<ol style="list-style-type: none"> 1. To understand the concept, process and importance of communication. 2. To acquire and develop good communication skills requisite for business correspondence. 3. To develop awareness regarding new trends in business communication.



S. Y. B. Com. (Semester III)	232	CORPORATE ACCOUNTING - I	<ol style="list-style-type: none"> 1. To acquaint the student with knowledge about various Concepts, Objectives and applicability of some important accounting standards associated with to corporate accounting. 2. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases. 3. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013
S. Y. B. Com. (Semester III)	233	BUSINESS ECONOMICS (MACRO)	<ol style="list-style-type: none"> 1. To familiarize the students to the basic theories and concepts of Macro Economics and their application. 2. To study the relationship amongst broad aggregates. 3. To impart knowledge of business economics. 4. To understand macroeconomic concepts. 5. To introduce the various concepts of National Income.
S. Y. B. Com. (Semester III)	234	BUSINESS MANAGEMENT - I	<ol style="list-style-type: none"> 1. To provide basic knowledge and understanding about various concepts of Business Management. 2. To help the students to develop cognizance of the importance of management principles. 3. To provide an understanding about various functions of management.
S. Y. B. Com. (Semester III)	235	ELEMENTS OF COMPANY LAW	<ol style="list-style-type: none"> 1. To develop general awareness of Elements of Company Law among the students. 2. To understand the Companies Act 2013 and its provisions. 3. To have a comprehensive understanding about the existing law on formation of new company in India.
S. Y. B. Com. (Semester III)	236(E)	Cost and Works Accounting I (BASICS OF COST ACCOUNTING)	<ol style="list-style-type: none"> 1. To prepare learners to know and understand the basic concepts of cost. 2. To understand the elements of cost. 3. To enable students to prepare a cost sheet. 4. To facilitate the learners to understand, develop and apply the techniques of inventory control.
S Y B Com (Semester IV)	241	BUSINESS COMMUNICATION-II	<ol style="list-style-type: none"> 1. To understand the concept, process and importance of communication. 2. To acquire and develop good communication skills requisite for business correspondence. 3. To develop awareness regarding new trends in business communication.
S Y B Com (Semester IV)	242	CORPORATE ACCOUNTING - II	<ol style="list-style-type: none"> 1. To acquaint the student with knowledge of corporate policies of investment for expansion and growth through purchase of stake in or absorption of smaller units. 2. To develop the knowledge among the student about consolidation of financial statement with the process of holding. 3. To update the students with knowledge of the process of liquidation of a company
S Y B Com (Semester IV)	243	BUSINESS ECONOMICS (MACRO)-II	<ol style="list-style-type: none"> 1. To familiarize the students to the basic theories and concepts of Macro Economics and their application. 2. To understand the theories of money.



			3. To understand the phases of trade cycle and policy measures to elongate the trade cycle.
S Y B Com (Semester IV)	244	BUSINESS MANAGEMENT-II	1. To make students capable of becoming good human resource of the corporate sector. 2. To equip the students about the various meetings of Companies and their importance.
S Y B Com (Semester IV)	245	ELEMENTS OF COMPANY LAW-II	1. To develop general awareness among the students about management of company 2. To have a comprehensive understanding about Key managerial Personnel of company and their role in Company administration. 3. To acquaint the students about E Governance and E Filing under the Companies Act, 2013.
S Y B Com (Semester IV)	246(E)	COST & WORKS ACCOUNTING-II	1. To know the documents that are used in stores and how to calculate the issuing price of material. 2. To provide knowledge to students on classification and codification. 3. To equip students with knowledge regarding the ascertainment of labour cost.

T.Y. B. Com. Degree course (CBCS)

T. Y. B. Com. (Semester V) (2019 Pattern)

Semester	Course Code	Course Name	Objective of the Course
T.Y.B. Com. Semester – V	351	Business Regulatory Framework	1. To provide conceptual knowledge about the framework of business Law in India. 2. To orient the students about the legal aspect of business. 3. To create awareness among the students about legal environment relating to the Contract Law, Partnership Act, Sale of Goods Act in India.
T.Y.B. Com. Semester – V	352	ADVANCED ACCOUNTING - I	1. To acquaint the student with knowledge about various concepts, objectives, and applicability of some important accounting standards.



			<ol style="list-style-type: none"> 2. To develop the knowledge among the students about reorganization of business regarding restructuring the capital. 3. To update the students with knowledge for preparation of final accounts of a Banking Companies with the provisions of Banking Regulation Act 1949.
T.Y.B. Com. Semester – V	353	Indian & Global Economic Development	<ol style="list-style-type: none"> 1. To develop ability to analyze economic development process of India. 2. To impart knowledge about the relevance of economic practices in modern competitive world. 3. To help the students develop a sound theoretical foundation for their future academic ventures.
T.Y.B. Com. Semester – V	355 – e	Cost and Works Accounting. Special Paper II	<ol style="list-style-type: none"> 1. To provide knowledge about the concepts and principles of overheads. 2. To Introduce the cost accounting standards and the cost accounting standard board. 3. To understand the stages involved in the accounting of overheads.
T.Y.B. Com. Semester – V	356 –E	Cost and Works Accounting Special Paper III	<ol style="list-style-type: none"> 1. To prepare learners to understand the basic techniques in Cost Accounting 2. To understand the learner, application of Cost Accounting techniques in cost control and decision making. 3. To enable the learners to prepare various types of Budgets.
T.Y.B. Com. Semester – V	354	Auditing	<ol style="list-style-type: none"> 1. To acquaint themselves about the Definition, Nature, Objectives and Advantages of Auditing, Types of Audit, Errors and Fraud, Audit Program, Notebook, Working Paper, Internal Control, Check. 2. To get knowledge about concept of Checking, Vouching, Verification and Valuation, Types of Audit Report and Auditing Assurance Standard. 3. To know the various new concepts in computerized system and Forensic Audit.
T.Y.B. Com. Semester – VI	361	Business Regulatory Framework	<ol style="list-style-type: none"> 1. To develop general awareness of Business Law among the students. 2. To understand the various statutes containing regulatory mechanism of business and its relevant provisions including different types of partnerships. 3. To have an understanding about the landmark cases/decisions having impact on business laws
T.Y.B. Com. Semester – VI	362	ADVANCED ACCOUNTING – II	<ol style="list-style-type: none"> 1. To acquaint the student with knowledge about the legal provisions regarding preparation and presentation of final accounts of Co-operative Societies. 2. To empower to students about the branch accounting in simple. 3. To make aware the students about the conceptual aspects of various recent trends in the field of accounting especially forensic accounting, accounting of CSR activities, accounting of derivative contracts and Artificial Intelligence in Accounting.



T.Y.B. Com. Semester – VI	363	Indian & Global Economic Development	<ol style="list-style-type: none"> 1. To develop ability of students to analyze economic development process of India. 2. To acquaint the students with the knowledge of recent trends in Human Development Index. 3. To acquaint students with the emerging issues in policies of India's foreign trade.
T.Y.B. Com. Semester – VI	364	Auditing & Taxation - II	<ol style="list-style-type: none"> 1. To understand the basic concepts of Income Tax Act, 1961 and create awareness of direct taxation among the students. 2. To understand the income tax rules and regulations and its provisions. 3. To have a comprehensive knowledge of calculation various types of income.
T.Y.B. Com. Semester – VI	365 – E	Cost and Works Accounting Special Paper II	<ol style="list-style-type: none"> 1. To provide knowledge about the various methods of costing. 2. To understand the applications of different methods of costing in manufacturing and service industries. 3. To enable students to prepare cost statements under different types of manufacturing industries and Service Industries
T.Y.B. Com. Semester – VI	366 – E	Cost and Works Accounting Special Paper III	<ol style="list-style-type: none"> 1. To impart knowledge about Standard Costing and Variance Analysis 2. To learn about pricing policy and its implementation. 3. To know the related Cost Accounting Standards and Cost Management practices in specific sectors



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PROGRAMME OBJECTIVES: (POs)

Department of Microbiology

F.Y. BSc Degree Course (CBCS-2019)

Objectives to be achieved

- To enrich students' knowledge and train them in the pure microbial sciences
- To introduce the concepts of application and research in Microbiology
- To inculcate sense of scientific responsibilities and social and environment awareness
- To help student's build-up a progressive and successful career

Semester	Course Code	Course Name	Objectives of the Course
I	MB: 111	Introduction to Microbial World	1.To introduce students with amazing world of Microbiology 2. To help students to know Types of Microorganism and their differentiating characters 3.To introduce them with Development of microbiology as a discipline 4.To help students for understanding the discovery of microscope and Microorganisms
I	MB: 112	Basic Techniques in Microbiology	1.To introduce students with working and different types of microscopy 2 .To help students to know the different staining techniques, 3. To emphasize the students to know about the Sterilization & Disinfection.
I	MB: 113	Practical Course based on theory paper I (MB 111) and Paper II (MB 112)	1.To introduce with basic safety measures and Good Laboratory Practices in microbiology laboratory 2. To gain the knowledge about operation, precautions and use of common microbiology laboratory instruments. 3. To help the students to know about actual use of common laboratory glass wares 4. To impart skills and knowledge to perform different staining techniques.
II	MB: 121	Bacterial Cell and Biochemistry	1.To study Structure, chemical composition and functions, components in bacterial cell 2. To gain the knowledge about Carbohydrates definition, Classification. 3. To introduce students with Atom, To introduce with Biomolecules, types of bonds, linkages
II	MB: 122	Microbial cultivation and growth	1. To introduce the students with cultivation of Microorganisms.



			2. To introduce the basic concepts of kinetics of bacterial growth, generation time.
II	MB: 123	Practical Course based on theory paper I (MB 121) and Paper II (MB 122)	<ol style="list-style-type: none"> 1. Preparation of simple laboratory nutrient media 2. To study the effect of different parameters on growth of E. coli 3. To study enumeration of bacteria. 4. To help students to understand normal flora of skin.

S. Y. BSc Degree Course (CBCS-2019)

Microbiology

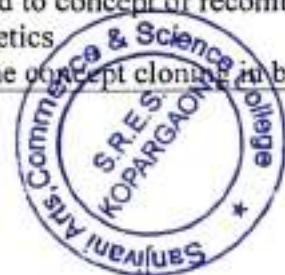
Semester	Course Code	Course Name	Objectives of the Course
III	MB-231	Medical Microbiology and Immunology	<ol style="list-style-type: none"> 1. To understand Classification, Morphological, Cultural and Biochemical characters, Antigenic structure, Viability characteristics, Pathogenicity, Pathogenesis, Symptoms, Laboratory diagnosis, Epidemiology, Prophylaxis and Chemotherapy of the pathogenesis. 2. To understand different types of immune system 3. To study formation of different types of blood cells. 4. To understand definition and concept of Antigens and antibodies, Immunohematology
III	MB-232	Bacterial Physiology and Fermentation Technology	<ol style="list-style-type: none"> 1. Introduce students with Enzymes, Bacterial physiology 2. To help students to study Concept of fermentation technology 3. Impart students to gain knowledge about Design of a Fermenter and Monitoring of different fermentation parameters, Types of fermentation. 4. To study Contamination: Sources, precautions and consequences
III	MB-231	Practical course based on MB 231 and MB 232	<ol style="list-style-type: none"> 1. To study Biochemical characterization of bacteria 2. To learn Isolation and identification of pathogens from clinical samples 3. Primary screening of industrially important organisms
IV	MB 241 Bacterial Genetics Semester IV	Bacterial Genetics	<ol style="list-style-type: none"> 1. To Understand DNA, Types of nucleic acids, Structure of DNA, Prokaryotic DNA replication 2. To study Gene expression 3. To Understand different types of Mutations and reversions, Plasmid genetics.
IV	MB-242	Air, Water and Soil Microbiology	<ol style="list-style-type: none"> 1. To help students to understand Air Microbiology and Water Microbiology 2. To study Bacteriological methods of water for potability



			3.Help students to understand soil microbiology
IV	MB-243 Practical course based on MB 241 and MB 242	Practical course based on MB 241 and MB 242	<ol style="list-style-type: none"> 1.To gain practical knowledge about Air sampling using an air sampler 2. To study different Bacteriological tests for potability of water 3. To study Enrichment, Isolation, Preparation and Application of Bio inoculant

T. Y. BSc Degree Course

Semester	Course Code	Course Name	Objectives of the Course
III	MB 331	Medical Microbiology- I	<ol style="list-style-type: none"> 1. To Understand the human anatomy, pathogens associated with diseases. 2. To assess epidemiological patterns of microbial disease transmission as various modes, intensity at local and global level. 3. Study of bacterial pathogens: 4. To comprehend of pathogenesis of specific pathogens causing microbial diseases.
IV	MB 341	Medical Microbiology II	<ol style="list-style-type: none"> 1. To gain Knowledge principles of chemotherapy of microbial diseases and development of drug resistance among pathogens and strategies to mitigate. 3. To develop identification systems for microbial disease diagnosis, disease treatment and prevention measures. 3. To Study viral pathogens with respect to – Virion characteristics, Viability characteristics, Pathogenicity, Pathogenesis, Symptoms, Laboratory diagnosis including serological diagnosis, etc 4. To Study Parasites, Candida and Non-Candida fungal pathogens
III	MB – 332	Genetics and molecular biology - I	<ol style="list-style-type: none"> 1. To study different types of DNA Replication methods and mismatch repair system 2. To study Prokaryotic and Eukaryotic Transcription 3. To study Prokaryotic and Eukaryotic Translation
IV	MB – 342	Genetics and molecular biology - II	<ol style="list-style-type: none"> 1. To understand Techniques used in recombinant DNA technology 1. To study Gene transfer by transformation, Transduction and conjugation. 2.To understand DNA damage and repair mechanisms 3. To get introduced to concept of recombination and bacteriophage Genetics 4. To understand the concept cloning in bacteria



			3. To demonstrate the knowledge of common and advanced laboratory practices in Molecular Biology
III	MB – 333	Enzymology	<ol style="list-style-type: none"> 1. To understand methods of active site determination, role of enzymes and its cofactors in microbial physiology. 2. To learn to perform enzyme assay, purification and quantification of enzymes activity, enzyme kinetics in terms of initial, final velocity, mathematical expression of enzyme kinetic parameters. 3. To correlate regulation of metabolism at enzymatic levels and apply, methodology for commercial applications of enzymes
VI	MB – 343	Metabolism	<ol style="list-style-type: none"> 1. To learn mechanisms of transport of solutes across the membrane 2. To get acquainted with mechanism of biosynthesis and degradation of bio molecules 3. To comprehend basic concept of autotrophic mode of metabolism of prokaryotes
III	MB – 334:	Immunology – I	<ol style="list-style-type: none"> 1. Adaptive / Acquired Immunity (Third line of defence) 2. To Understand immune system structure, composition, function and comparison of different types of immunity. 3. To Acquire knowledge about antigens, Recognition of pathogens; antigen processing and presentation; Immunity to infection and pathological consequences of immunodeficiencies.
IV	MB – 344	Immunology – II	<ol style="list-style-type: none"> 1. To learn the applications of Immunology in monoclonal antibodies, vaccines production and Immunotherapy. 2. To study Immunoematology 3. To Understand abnormal working of Immune system in hypersensitivity, auto immune diseases, immune tolerance and transplantation immunology. 4. To develop strategies for Diagnosis of diseases based on antigen and antibody reactions with emphasis on prevailing communicable diseases.
III	MB – 335	Fermentation Technology– I	<ol style="list-style-type: none"> 1. To impart technical understanding of commercial fermentations. 2. To apply classical, advanced strain improvement and isolation techniques for fermentation processes. 3. To optimize and sterilize media used in fermentation industry for commercially economical and efficient fermentations. 4. To recover the product using suitable methods and ensuring quality of the finished product by quality assurance tests



			5. To study Quality assurance (QA) of fermentation product
IV	MB – 345	Fermentation Technology – II	<ol style="list-style-type: none"> 1 To Introduce with Solid State Fermentation and Submerged Fermentation 2. To acquaint fermentation economics, process patentability, process validation. 3. To comprehend the large scale productions of commercially significant fermentation products of classical and recent significance.
III	MB 336	Food and dairy microbiology	<ol style="list-style-type: none"> 1. To describe food safety problems and solutions in India and global scale. 2. To study Milk Chemistry and Constituents 3. To acquire knowledge about food spoilage, food borne diseases, Pre disposition and preventive and control measures. 4. To understand prospects of dairying at commercial marketing. 5. To acquire skills of processing of milk and dairy products. 6. To assess quality control in dairy industry. 7. To comprehend production of dairy products of commercial significance with emphasis to local and global market demand.
IV	MB – 346	Agricultural and environmental microbiology	<ol style="list-style-type: none"> 1. To understand plant growth improvement with respect to disease resistance, environment tolerance. 2. To correlate stages of plant disease development, epidemiology, and symptom based classification, control methods. 3. To understand the importance of microorganisms in sustainable agriculture, biotechnological application of bio films, edible vaccines, bioremediation, bio augmentation, bioleaching etc 4. To correlate Soil Micro biome and Role of microorganisms in soil health 5. To determine the use of Microorganisms as tools in plant genetic engineering 6. Biofuel cells and Biodegradable plastic
IV	MB – 347	Practical course – I applied microbiology	<ol style="list-style-type: none"> 1. To help students to gain practical knowledge of Sterility Testing of pharmaceuticals 2. To help students to study MIC and MBC 3. To Understand Antibiotic and growth factor assay To Isolate PGPR 4. To study Validation of commercial formulations of bioinoculants 5. To understand Biosynthesis of nanoparticles 6. To Tests for Milk and Dairy products by using different test



IV	MB – 348	Practical course – II biochemistry and molecular biology	<ol style="list-style-type: none"> 1. To study practical based on clinical biochemistry 2. To impart students to understand techniques of Enzyme production, purification, quantification and Immobilization 3. TO help students for Enrichment, Isolation and Enumeration of Bacteriophages 4. To gain the practical knowledge useful in enzymology and genetics. 5. To learn methods for Preparation of buffers and calibration of pH meter 6. To study Chromatographic techniques useful in purification 7. Qualitative analytical tests
IV	MB – 349	Practical course – III diagnostic microbiology and immunology	<ol style="list-style-type: none"> 1. To study practical based on Clinical microbiology 2. To develop skills of Isolation, identification of following pathogens from clinical samples 3. To study practical based on Agglutination test and hemogram 4. Demonstration of permanent slides of following parasites 5. To study the different techniques of Immuno chromatographic test: Immunoprecipitation



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M.Sc. I – Chemistry (CBCS) 2019-2020
Semester – I and Semester II

Semester	Course Code	Course Name	Objective of the course
M.Sc. I	CCTP-1 CHP-110	Physical Chemistry-I (Fundamentals of Physical Chemistry)	<ol style="list-style-type: none"> 1. Know historical of development of quantum mechanics in chemistry. 2. Understand and explain the differences between classical and quantum mechanics. 3. Know historical of development of quantum mechanics in chemistry. 4. Understand and explain the differences between classical and quantum mechanics. 5. Difference between thermal and photochemical processes. 6. photochemical laws: Grothus - Draper law, Stark-Einstein law, 7. Quantum yield and reasons for high and low quantum yield, 8. factors affecting the quantum yield,
M.Sc. I	CCTP-2 CHI-130	Inorganic Chemistry-I (Molecular Symmetry and Chemistry of Main Group Elements)	<ol style="list-style-type: none"> 1. Student should visualize/ imagine molecules in 3 dimensions. 2. To understand the concept of symmetry and able to pass various symmetry elements through the molecule. 3. Understand the concept and point group and apply it to molecules. 4. To understand product of symmetry operations. 5. To apply the concept of point group for determining optical activity and dipole moment. 6. Student should understand the detail chemistry of S and P block elements w.r.t. their compounds, their reactions and applications. 7. To learn the advance chemistry of boranes, fullerene, zeolites, polymers etc. 8. Organometallic chemistry of some important elements from the main groups and their applications

M.Sc. I	CCTP-3 CHO-150	Organic Chemistry-I (Basic Organic Chemistry)	<ol style="list-style-type: none"> 1. They will understand the criteria for aromaticity in non-benzenoid molecules and other advanced polycyclic aromatics 2. Understand the chemistry of monocyclic heterocycles, nomenclature and reactions 3. Learn the concept stereochemistry and its importance; their rules and the concept of chirality 4. Understand the role of various reaction intermediates like carbocation, carbanion, carbenes, radicals, and nitrenes in organic reactions; concept of NGP 5. Able to describe mechanism of different rearrangement reactions. Appreciates the various steps involved in the molecular rearrangements.
M.Sc. I	CBOP-1 CHG-190	Section-I: General Chemistry-I, Theory Course Elective Option-A: Introduction to Solid State of Matter	<ol style="list-style-type: none"> 1. Bonding in solids – band theory 2. Electronic conductivity 3. Semiconductors, photoconductivity 4. Non-stoichiometry, defects and types of defects in solids 5. Ionic conductivity and their applications 6. Superconductivity and theory of superconductivity 7. Method of synthesis of solids
M.Sc. I	CCPP-1 CHP-107	Basic Practical Chemistry-I	<ol style="list-style-type: none"> 1. This practical course is also designed to make student aware of green chemistry and role of green chemistry in pollution reduction. 2. The students learn how to avoid solvents and do solvent free reaction. <p>. Also the work-up procedure in many experiments is made more eco-friendly to environment.</p>
M.Sc. II	CCTP-4 CHP-210	Physical Chemistry - II (Molecular Spectroscopy and Nuclear Chemistry)	<ol style="list-style-type: none"> 1. Students should able to solve $^1\text{H-NMR}$ problems and should also able to draw the $^1\text{H-NMR}$ spectrum for simple organic compounds mentioning multiplicity pattern and coupling constant with the help of "Tree Diagram" Should able to predict and analyze the multiplicity patterns with more than one coupling constants. 2. Students should know various key factors responsible for the spectroscopic data acquisition and should able to solve Problems based on UV, IR, MS, $^1\text{H-NMR}$, $^{13}\text{CNMR}$.
M.Sc. II	CCTP-5 CHI-230	Inorganic Chemistry -II (Coordination and	<ol style="list-style-type: none"> 1. Student should able to find out the no of microstates and meaningful term symbols,

		Bioinorganic Chemistry)	<p>construction of microstate table for various configuration</p> <ol style="list-style-type: none"> Hund's rules for arranging the terms according to energy. Student should understand interelectronic repulsion. Student should know the concept of weak and strong ligand field. Student able to find out splitting of the free ion terms in weak ligand field and strong ligand field. Importance of bioinorganic chemistry. Role of metals in Metalloprotein and metalloenzymes. Similarities in coordination theory for metal complexes and metal ions complexed with biological ligands. Importance and transport of metal ions.
M.Sc. II	CCTP-6 CHO-250	Organic Chemistry-II (Photochemistry, Pericyclic and Organic spectroscopy)	<ol style="list-style-type: none"> Students should able to understand free radicals' formation, stability and reactivity and should also be able to use the basic understanding in writing probable reaction mechanisms. Students should able to write MO diagram for various olefinic compounds and should able to predict the products, the stereochemistry as well as should able to understand the preferred reaction pathways. Students should able to calculate λ_{max} of organic compounds containing more than one and less than four conjugated systems. Students should able to correlate IR bands with functional groups using numerical data as well as spectral data.
M.Sc. II	CBOP-2 CHG-290	Section-I: General Chemistry-II, Theory Elective Option-A : Material Characterization Technique	<ol style="list-style-type: none"> Different characterization technique of solids. Principle of XRD, instrumentation of powder XRD, Bragg's law, applications of XRD for crystal structure determination, numerical problems. Principle of SEM, instrumentation of SEM and interpretation of surface morphology of solid from SEM. Principle of TEM, instrumentation of TEM and interpretation of TEM images. Basics of X-rays, Principle of XRF, types of XRF, instrumentation, qualitative and quantitative analysis, numerical.

		Section-II: General Chemistry, Practical Elective Option-A: Electroanalytical Techniques of Analysis	<ol style="list-style-type: none"> 1. Students are trained to different purification techniques in organic chemistry like recrystallization, distillation, steam distillation and extraction. 2. Students are made aware of safety techniques and handling of chemicals.
M.Sc. II	CCPP-2 CHP-227	Basic Practical Chemistry-II	<ol style="list-style-type: none"> 1. This course is designed to make students aware of how to perform organic compounds in laboratory. 2. The course includes synthesis of some derivatives and organic compounds, which will help them while working in research laboratory in future. 3. Making derivatives of organic compounds will help them in industry or while doing research in medicinal chemistry for Drug development.



**Sanjivani Rural education society's
Sanjivani arts, Commerce and Science College,
Kopargaon**

PO's and CO's
Glossary for exemplars

F. Y. B. Sc. – Chemistry (CBCS) 2019-2020
Semester – I and Semester II

Semester	Course Code	Course Name	Objective of the course
F. Y. B.Sc. I	CH-101	Physical Chemistry	<ol style="list-style-type: none"> 1. To understand basic concept of physical, organic and Inorganic chemistry. 2. To impart practical skills and learn basics behind experiments. 3. To prepare background for advanced and applied studies in chemistry.
F. Y. B.Sc. I	CH-102	Organic Chemistry	<ol style="list-style-type: none"> 1. The students are expected to understand the fundamentals, principles, and recent developments in the subject area. 2. It is expected to inspire and boost interest of the students towards chemistry as the main subject. 3. To familiarize with current and recent developments in Chemistry. 4. To create foundation for research and development in Chemistry.
F. Y. B.Sc. I	CH-103	Chemistry Practical I	<ol style="list-style-type: none"> 1. Importance of chemical safety and Lab safety while performing experiments in laboratory 2. Determination of thermochemical parameters and related concepts 3. Techniques of pH measurements 4. Preparation of buffer solutions 5. Elemental analysis of organic compounds (non - instrumental) 6. Chromatographic Techniques for separation of constituents of mixtures
F. Y. B.Sc. II	CH-201	Inorganic Chemistry	<ol style="list-style-type: none"> 1. Students will learn quantum mechanical approach to atomic structure, Periodicity of elements, various theories for chemical bonding. 2. To prepare background for advanced and applied studies in chemistry.
F. Y. B.Sc. II	CH-202	Analytical Chemistry	<ol style="list-style-type: none"> 1. Students will know about basics of analytical chemistry, some techniques of analysis and able to do calculations essential for analysis. 2. To impart practical skills and learn basics behind experiments.
F. Y. B.Sc. II	CH-203	Chemistry Practical II	<ol style="list-style-type: none"> 1. Inorganic Estimations using volumetric analysis 2. Synthesis of Inorganic compounds 3. Analysis of commercial products 4. Purification of organic compounds 5. Preparations and mechanism of reactions involved



S. Y. B. Sc. – Chemistry (CBCS) 2019-2020
Semester – III and Semester IV

Semester	Course Code	Course Name	Objective of the course
S. Y. B.Sc. III	CH-301	Physical & Analytical Chemistry	<ol style="list-style-type: none"> 1. To understand basic concept of physical, Analytical, Organic and Inorganic chemistry. 2. To impart practical skills and learn basics behind experiments. 3. To prepare background for advanced and applied studies in chemistry.
S. Y. B.Sc. III	CH-302	Inorganic & Organic Chemistry	<ol style="list-style-type: none"> 1. The students are expected to understand the fundamentals, principles, and recent developments in the subject area. 2. It is expected to inspire and boost interest of the students towards chemistry as the main subject. 3. To familiarize with current and recent developments in Chemistry. 4. To create foundation for research and development in Chemistry.
S. Y. B.Sc. III	CH-303	Chemistry Practical III	<ol style="list-style-type: none"> 1. Importance of chemical safety and Lab safety while performing experiments in laboratory 2. Determination of thermochemical parameters and related concepts 3. Techniques of pH measurements 4. Preparation of buffer solutions 5. Elemental analysis of organic compounds (non - instrumental) 6. Chromatographic Techniques for separation of constituents of mixtures
S. Y. B.Sc. IV	CH-401	Physical & Analytical Chemistry	<ol style="list-style-type: none"> 1. Students will learn quantum mechanical approach to atomic structure, Periodicity of elements, various theories for chemical bonding. 2. To prepare background for advanced and applied studies in chemistry. 3. Students will know about basics of analytical chemistry, some techniques of analysis and able to do calculations essential for analysis.
S. Y. B.Sc. IV	CH-402	Inorganic & Organic Chemistry	<ol style="list-style-type: none"> 1. To impart practical skills and learn basics behind experiments.
S. Y. B.Sc. IV	CH-403	Chemistry Practical IV	<ol style="list-style-type: none"> 1. Inorganic Estimations using volumetric analysis 2. Synthesis of Inorganic compounds 3. Analysis of commercial products 4. Purification of organic compounds

			5. Preparations and mechanism of reactions involved
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T. Y. B. Sc. – Chemistry (CBCS) 2021-2022
Semester – V and Semester VI

Semester	Course Code	Course Name	Objective of the course
T. Y. B.Sc. V	CH-501	Physical Chemistry -I	<ol style="list-style-type: none"> 1. Know historical of development of quantum mechanics in chemistry. 2. Understand and explain the differences between classical and quantum mechanics. 3. Know historical of development of quantum mechanics in chemistry. 4. Understand and explain the differences between classical and quantum mechanics. 5. Difference between thermal and photochemical processes. 6. photochemical laws: Grothus - Draper law, Stark-Einstein law, 7. Quantum yield and reasons for high and low quantum yield, 8. factors affecting the quantum yield,
T. Y. B.Sc. V	CH-502	Analytical Chemistry - I	<ol style="list-style-type: none"> 1. Explain different principles involved in the gravimetry, spectrophotometry, parameters in instrumental analysis, qualitative analysis. 2. Perform quantitative calculations depending upon equations student has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. 3. Discuss / Describe procedure for different types analyses included in the syllabus. 4. Select particular method of analysis if analyte sample is given to him.
T. Y. B.Sc. V	CH-504	Inorganic Chemistry -I	<ol style="list-style-type: none"> 1. Explain electroneutrality principle and different types of pi bonding. 2. Able to explain Nephelauxetic effect towards covalent bonding. 3. To understand about inert and labile complexes and stability of complexes in aqueous solutions 4. Classification of reactions of coordination compounds 5. The basic mechanisms of ligand substitution reactions. 6.To know position of d-block elements in periodic table.



T. Y. B.Sc. V	CH-505	Industrial Chemistry	<ol style="list-style-type: none"> 1. Importance of chemical industry, 2. Knowledge of various industrial aspects 3. They should also know the physico-chemical principals involved in manufacturing process 4. Concept of basic chemicals, 5. Their uses and manufacturing process.
T. Y. B.Sc. V	CH-507	Organic Chemistry -I	<ol style="list-style-type: none"> 1. Define and classify polynuclear and heteronuclear aromatic hydrocarbons. 2. Write the structure, synthesis of polynuclear and heteronuclear aromatic hydrocarbons. 3. Understand the reactions and mechanisms 4. Explain the reactivity of polynuclear and heteronuclear aromatic hydrocarbons. 5. Describe the synthesis of chemical reactions of polynuclear and heteronuclear aromatic Hydrocarbons.
T. Y. B.Sc. V	CH-508	Chemistry of Biomolecules	<ol style="list-style-type: none"> 1. The student will understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell. 2. The student will understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell. 3. The student will understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell. 4. features of various types of enzyme inhibitions, industrial applications of enzymes.
T. Y. B.Sc. V	CH-510 (A)	Medicinal Chemistry	<ol style="list-style-type: none"> 1. The basics of medicinal chemistry, biophysical properties, overview of basic concepts of traditional systems of medicine. 2. Over view of the overall process of drug discovery, and the role played by medicinal chemistry in this process. 3. Biological activity parameters and importance of stereochemistry of drugs and receptors. 4. Knowledge of mechanism of action of drugs belonging to the classes of infectious and non-infectious diseases. 5. Enhancement of practical skills in synthesis, purification and analysis.
T. Y. B.Sc. V	CH-511 (A)	Environmental Chemistry	<ol style="list-style-type: none"> 1. Importance and conservation of environment. 2. Importance of biogeochemical cycles 3. Importance and conservation of environment. 4. Importance of biogeochemical cycles



T. Y. B.Sc. V	CH-503	Physical Chem. Practical I	<ol style="list-style-type: none"> 1. Demonstrate theoretical principles with help of practical. 2. Design analytical procedure for given sample. 3. Apply whatever theoretical principles he has studied in theory during practical session in laboratory.
T. Y. B.Sc. V	CH-506	Inorganic Chem. Practical I	<ol style="list-style-type: none"> 1. To develop skills required in chemistry such as the appropriate handling of apparatus and chemicals. 2. The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research. 3. To expose the students to an extent of experimental techniques using modern instrumentation.
T. Y. B.Sc. V	CH-509	Organic Chem. Practical I	<ol style="list-style-type: none"> 1. The student will develop the ability to effectively communicate scientific information and research results in written and oral formats. 2. Apply whatever theoretical principles he has studied in theory during practical session in laboratory. 3. Understand principle of Thin Layer Chromatographic techniques. 4. Understand the purification technique used in organic chemistry
T. Y. B.Sc. VI	CH-601	Physical Chemistry II	<ol style="list-style-type: none"> 1. Electrochemical cells: Explanation of Daniell cell, Conventions to represent electrochemical cells 2. Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell with suitable example, 3. EMF of electrochemical cell and its measurement. 4. Distinguish between crystalline and amorphous solids / anisotropic and isotropic solids. 5. Radioactivity 6. Types and properties of radiations: alpha, beta and gamma
T. Y. B.Sc. VI	CH-602	Physical Chemistry III	<ol style="list-style-type: none"> 1. Factors affecting on solid state reactions, 2. Rate laws for reactions in solid state 3. Applying rate laws for solid state reactions 4. Results of kinetics studies 5. History of polymers. 6. Classification of polymers 7. Chemical bonding & Molecular forces in Polymer 8. Molecular weight of polymers



T. Y. B.Sc. VI	CH-604	Inorganic Chemistry II	<ol style="list-style-type: none"> 1. To understand M-C bond and to define organometallic compounds 2. To define organometallic chemistry 3. Define and differentiate homogeneous and heterogeneous catalysis. 4. Give examples and brief account of homogeneous catalysts. 5. Understand the phenomenon of catalysis, its basic principles and terminologies.
T. Y. B.Sc. VI	CH-605	Inorganic Chemistry III	<ol style="list-style-type: none"> 1. Student will learn the concept of acid base and their theories. 2. They will also come to know different properties of acids and bases. 3. Strength of various types acids. 4. How acid and base strengths get affected in non-aqueous solvents. 5. Various methods of nanoparticle synthesis 6. Stabilization of Nanoparticles in solution 7. Properties and Application of Nanoparticles 8. Know about carbon nanotube and its application
T. Y. B.Sc. VI	CH-607	Organic Chemistry II	<ol style="list-style-type: none"> 1. Students will learn the interaction of radiations with matter. 2. They will understand different regions of electromagnetic radiations. 3. They will know different wave parameters <p>Students will learn the interaction of radiations with matter.</p> <ol style="list-style-type: none"> 4. They will understand different regions of electromagnetic radiations. 5. They will know different wave parameters
T. Y. B.Sc. VI	CH-608	Organic Chemistry III	<ol style="list-style-type: none"> 1. The use of models to draw different types of disubstituted cyclohexanes in chair form 2. The geometrical isomerism in disubstituted cyclohexanes 3. The stability, energy calculations and optical activity of these conformers 4. The use models and to draw different types of conformational isomers of decalin in chair form 5. To know the stability of geometrical isomers of decalin
T. Y. B.Sc. VI	CH-610 (A)	Chemistry of Soils & agrochemicals	<ol style="list-style-type: none"> 1) Know the different components and properties of soil. 2) Know classification of soil on the basis of pH. 3) Identify the problematic soil and recommend method for their reclamation.

			<p>4) Know the different plant nutrients required for plants and their functions.</p> <p>5) Know the role of various fertilizers and manures required for plant growth.</p> <p>6) Know the various methods and their techniques in analysis of soil.</p> <p>7) Know importance of manures as compared to chemical fertilizers.</p>
T. Y. B.Sc. VI	CH-611 (A)	Analytical Chemistry II	<p>1. Explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques.</p> <p>2. Differentiate / distinguish / compare among the different analytical terms, process and analytical methods.</p> <p>3. Perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory.</p>
T. Y. B.Sc. VI	CH-603	Physical Chemistry Practical II	Perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory.
T. Y. B.Sc. VI	CH-606	Inorganic Chemistry Practical II	<p>1. Demonstrate theoretical principles with help of practical.</p> <p>2. Design analytical procedure for given sample.</p> <p>3. Apply whatever theoretical principles he has studied in theory during practical session in laboratory.</p>
T. Y. B.Sc. VI	CH-609	Organic Chemistry Practical II	<p>1. The student will develop the ability to effectively communicate scientific information and research results in written and oral formats.</p> <p>2. Apply whatever theoretical principles he has studied in theory during practical session in laboratory.</p> <p>3. Understand principle of Thin Layer Chromatographic techniques.</p> <p>4. Understand the purification technique used in organic chemistry</p>

