

**SHIKSHAK SANCHALIT SHIKSHAN SANSTHA'S**  
**DR. SHANTILAL DHANJI DEVSEY ARTS COLLEGE AND COMMERCE AND SCIENCE**  
**COLLEGE, WADA,**  
TALUKA: WADA, DIST: PALGHAR-421303 (M.S.)  
AFFILIATED TO UNIVERSITY OF MUMBAI

## Faculty of Arts

### Department of Marathi

#### Program & Course Outcome 2015-16 to 2019-20

#### Program Outcomes

Program specific Name	Outcome- After completion of program
Bachelor of Arts in Marathi	PSO1. Students will have understanding of role of Marathi language in various streams. PSO2. Students will acquire basic knowledge of different modes of Marathi language i. e as a standard language and as literary esthetic language and relation between dialect and standard language. PSO3.They will know the tradition of Marathi literature. PSO4: They will be get knowledge of Indian and western literary theories. PSO5. They will understand relation between literature and society.

#### Course Outcomes

Course Name & Code	Outcome( After completion of course) students will get
UAMARCOM 101, UAMARCOM201	CO1. Understanding of general role and methods in Marathi language in official and conventional communication. CO2. Understanding of literary mode of Marathi language. CO3. Understanding of human values and aesthetic approach to the life.

UAMAR 101, UAMAR 201	CO1.Understanding of concept of literary genre, CO2. Basic understanding of drama, story, and poetry as literary genre through prescribed text, CO3. Perspective on human relationship and life, nature.
UAMAR301, UAMAR401	CO1. Basic understanding of novel and autobiography as literary genre through prescribed text, CO2. Perspective on social, cultural and political dynamic in literary artifact.
UAMAR 302, UAMAR 402	CO1. Understanding concepts of dialectic and standard language and relation between them. CO2. Basic Understanding of various dialectics in Maharashtra. CO3 Beauty and Variety of dialectic literature, specially Agari dialect.
UAMAR 501, UAMAR601	CO1. Understanding of basic concept of literary history CO2. Knowledge of tradition of History of Marathi literary history CO3. Knowledge of History of Marathi literature of Middle age, i. Bhakti era and pre and early colonial era. CO4. Encompass of vast native literary tradition.
UAMAR502, UAMAR602	CO1. Understanding of basic concept of literary theory. CO2. Knowledge of Indian poetics and important literary theories. CO3. Knowledge of western poetics and important theories. CO4. Encompass of world literary theories.
UAMAR503, UAMAR 603	CO1. Understandings of co-relation between Literature and Society. CO2. Introduction of various Sociological approaches to the literature and Encompass world and Indian sociological approaches to the literature. CO3. Understanding of application of those approaches through prescribed literary texts. CO4. Application of acquired literary competence through project works.

## Department of English

### Program & Course Outcome 2015-6 to 2019-20

#### Program & Course Outcomes

Courses Offered	Subjects	Type of Course	Program Outcome	Program Specific Outcome	Course Outcome
F.Y.B.A.	Introduction to Literature Paper-I	Aided	To acquire students with the characteristics of various literary	To develop an analytical skills and critical thinking through close reading	To recognize the culture and context of the work of

			genres	of literary texts.	literature.
S.Y.B.A.	Indian Literature in English Paper- II	Aided	To Introduce learners to the uniqueness of Indian Literature in English	To develop pluralistic dimensions of Indian Literature in English	To acquaint and understand the different genres of Indian Literature in English
S.Y.B.A.	American Literature, Paper- III	Aided	To acquire the learners of literature with the various genres and literary terms of 2th Century American Literature	To introduce them to the socio-cultural milieu of 20 <sup>th</sup> century America through literary texts.	To enhance their understanding of American, African American and Multicultural sensibilities by introducing them to the literary works.
T.Y.B.A.	16 <sup>th</sup> to 18 <sup>th</sup> Century English Literature Paper-IV	Aided	To introduce Students to English Literature of the 16 <sup>th</sup> , 17 <sup>th</sup> and 18 <sup>th</sup> Century English Literature	To familiarize students with different writing styles that each age adopted	After complication of the course students are expected to understanding the distinctive features of English literature of 16 <sup>th</sup> , 17 <sup>th</sup> and 18 <sup>th</sup> century
T.Y.B.A.	Literary Criticism Paper- V	Aided	To make them aware of nature and function of literature and criticism	To impart the technique of close reading of literary texts	After complication of course students are expected to understand the various literary theories and critical approaches
T.Y.B.A.	Grammar and Art of Writing Paper- VI	Aided	To develop among them an insight into the structure of the English language	To help them learn grammatical analysis and description and the skills of sentence transformation	After the complication of the course, students are expected to be

			and to provide knowledge of the rules of grammar		able to have develop adequate knowledge of the rules of grammar, grammatical analysis and sentence transformation
S.Y.B.A.	Mass Communication	Aided	To introduce the students to some major aspects of communication and mass communication	To develop among the students a broad perspective of the past and the present status of mass media in India	By the end of the course the students should be able to receive and analyse media products critically and become interested in jobs or career in Media Industry
F.Y.B.Com.	Business Communication	Aided	To develop an awareness about the complexity of communication in a dynamic business environment	To develop effective oral, writing and listening skills and communication technology among learners	After successful completion of the course, the learner should have enhanced listening, speaking, reading and writing skills and should be prepared to meet the challenges of communication in the business world.
F.Y.B.A.	Communication Skills in English	Aided	To enhance the learners "Communication Skills" by giving adequate exposure in reading, writing, listening and	To build up the learners confidence in oral and interpersonal communication by reinforcing the basics of pronunciation	To o help the learners recognize and operate in various styles and registers in English

			speaking skills and the related sub-skills		
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## Department of History

**Program & Course Outcome 2015-6 to 2019-20**

### Program Outcome

Program Name B. A. Code : 3A00125	Outcome
Programme Specific Name : History Code :	<ol style="list-style-type: none"> <li>1) It will be helpful to create awareness among students to understand the progress and importance of socio-Economics and religious reform movements in all over the India.</li> <li>2) It will be useful for understanding a nationalize movement especially base of freedom Movement.</li> <li>3) Students can be achieved various competitive examination such as MPSC, UPSC, SSC, etc.</li> <li>4) Students have been open opportunities in archaeology, Numismatics, Museology, Achieves.</li> <li>5) It will be helpful to understand new approaches in historical research and work.</li> <li>6) History studies help students to become better citizens by developing socio-cultural harmonious perspectives</li> <li>7) It is related to constitution</li> <li>8) Is will being create an awareness and preservation of Historical monument which is include in constitution of India article [Part IVA Fundamental Duties 51A. (F).</li> <li>9) Studying history will make students aware of democratic values.</li> <li>10) History tends to find answers to contemporary issue through the study of</li> </ol>

	history
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### Course Outcome

Program	Course Name	Code	Outcome
B.A.	History	UAHIS101	It will be useful for understanding a nationalize movement especially base of freedom Movement.
		UAHIS201	It will be helpful to create awareness among students to understand the progress and importance of socio-Economics and religious reform movements in all over the India.
		UAHIS301	A significant event in the history of the world helps to create a universal outlook and consciousness of change.
		UAHIS302	
		UAHIS401	It is aware of the glorious culture and traditions of ancient India.
		UAHIS402	
		UAHIS501	Identifying the changing social and political developments in the history of medieval India.
		UAHIS502	
		UAHIS503A	It recognizes the changing social conditions and egalitarian progressives of Maharashtra.
		UAHIS601	Understands the importance of India's changing social, political events and republican democratic system.
		UAHIS602	The exploration and heritage sites of archaeological sites in India have come to understand historical significance.
		UAHIS603A	Students can be reminded of the importance and preservation of ancient artifacts through museum studies

## Department of Political Science

Program & Course Outcome 2015-6 to 2019-20

### Program & Program Specific Outcome

<p>Programme Name: Bachelor of Arts</p> <p>Code- (3A00146)</p>	<p><b>Programme Outcomes:</b> Student seeking admission for B.A. programme are expected to imbue with following quality which help them in their future life to achieve the expected goals.</p> <ul style="list-style-type: none"><li>a. Realization of human values.</li><li>b. Sense of social service.</li><li>c. Responsible and dutiful citizen.</li><li>d. Critical temper</li><li>e. Creative ability.</li></ul>
<p>Programme Specific Name: <b>Political Science</b></p> <p>de -</p>	<p><b>Program Specific Outcomes</b></p> <ul style="list-style-type: none"><li>1. Knowledge about political system of the nation.</li><li>2. Study of national and international political affairs.</li><li>3. Study from competitive examination point of view.</li><li>4. Understanding the government mechanism, its functions, duties and responsibilities.</li><li>5. Creating appropriate and efficient political leaders.</li><li>6. Getting knowledge of political law.</li><li>7. Getting knowledge of Constitution of India.</li></ul>

## Course Outcome

<b>Course Name &amp; Code</b>	<b>Outcome</b>
<b>Introduction to Political Science (UAPOL-101, 201)</b>	On completion of the course, students are able to – 01) Understand the nature of pol. science 02) Understand various concepts, approaches & theories 3)Study of various ideologies & values.
<b>Indian Political System (UAPOL-301,401)</b>	On completion of the course, students are able to – 01) Understand our nature of Indian political system. 02) Understand our party system & electoral process.
<b>Public Administration (UAPOL-302,402)</b>	On completion of the course, students are able to – 01) Understand various approaches & theories of Public Administration. 02)Study the thoughts of administrative thinkers. 03) Understand Indian administrative system. 04) Aware challenges to our administration.
<b>Political Process of Modern Maharashtra (UAPOL-503,603)</b>	On completion of the course, students are able to – 01) Understand political process of Maharashtra. 02) Study of different governmental committees / commissions reports. 03) Understand the problems of regional disparity.
<b>Political Thought (UAPOL-502,602)</b>	On completion of the course, students are able to – 01) Understand various ideas, concepts & approaches. 02) Compare different ideologies. 03) Study of great personalities & their contribution to society.



<b>International Relations (UAPOL-501,601)</b>	On completion of the course, students are able to – 01) Study various approaches of specific discipline. 02) Understand various concepts. 03) Study of India's foreign policy. 04) Compare our nations capabilities with other countries.
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## Department of Economics

### Program & Course Outcome 2015-6 to 2019-20

#### Program Outcome

Department objective of the B.A economics program are:

- To provided student a well-founded education in economics
- To prepare our graduate for employment and further study as economics.
- To provided student with the opportunity and theoretical aspect of economics.
- To provided student with the opportunity to focus on applied and policy issues in economics.

#### Course Outcome

Sr. no	Course name& code	Outcome
1.	Micro economics -I (ECOMIE101,201,301,&501)	This course is designed to provide and understanding the basic micro economics concept .and student should be able to build this concept in the future to develop deeper understanding of the economy. Student also known micro economics theory, market competition, and how get a social welfare. Those course provided knowledge real market production, consumer behavior.
2	Macro Economics - I (ECOMAE, 401,&601)	Macroeconomics is study of all of economy .this course provided knowledge student how to working open economy .student known to all economy system, government policy ,national income etc. and student should able to build of these consultants in the later year .so as able to analyses macro policies.
3.	Indian economy (ECOIE302)	This course part of the Indian economy .course can help and brief knowledge of Demonetization and demerits and impact of the economy and GDP.etc. Those course studying policy diversity and what policy help human health, poverty and

		nutrition. And all fact understanding this course.
4.	Economy of Maharashtra (ECOME402)	In this course overall introduce the Maharashtra economy nature. Focus on tribal area, student known tribal population, poverty, and all Issus .and these course information of water resources, water distribution and irrigations development .and this subject also inform the health and connectivity in Maharashtra.
5.	Economics of Development (ECODEV502)	In this course student can understanding the diverse concept deleted to economic growth and development .student can able think about issues by development process and student understanding by diverse impact factor on the development process like that poverty ,education ,health & nutrition. And economics theory help of student new ideas and new development think.
6.	International Economics (ECOINT602)	This course provided the student basic knowledge and developed the systematic model. This course known international trade, diverse trade policy and how can work the open economy system & monetary system. Student can understand international trade in both country. And how can determined exchange rate, price etc.
7.	Agriculture and co-operative economics (ECOILEC503, 603)	This course student understanding the basic concept of agriculture and co-operative economics. Course provided knowledge agriculture finance, agriculture problems, farmer suicide. Types of co-operative, principals of co-operative. Course study agro industry, housing, farmer co-operative society.

# **Faculty of Commerce**

## **Bachelor of Commerce**

### **Program & Course Outcome 2015-6 to 2019-20**

#### **Program Outcome**

We started commerce program to develop business skill and ability and awareness about competitive exam. Such as banking, LIC, Railway, MPSC, UPSC after completion education in commerce. Students also appear for C.A., ICWA, C.S., and M.Com. M.B.A., they are eligible to getting job in private sector or public sectors and also join industrial field and they also start their own business. Our college is located in Tribal area in Palghar District. Maharashtra Government has declared this area as a 'D' Zone. So that the well-known proprietors established various industries like Coca-cola, Vonida, Bhuwarka, Pratibha pipes, Charmminar, Blue Star, Gala and Goma etc. Most of the students are from BPL category. They are in needed job and money. So we decide to start the commerce program in our college.

The fruits come truth that, most of the students had successfully completed graduation in commerce and they have got the job in various industries, Banking field, service sectors, education field and some students started their own business.

#### **Course Outcome**

<b>Course Name &amp; Code</b>	<b>Outcome</b>
Accountancy	Students know the various concepts regarding production decide the product price, profit margin, how to maintain the ledger and final account. This subject is most important for various fields like Banking, Industrial area, Marketing and educational field.
Commerce	Student knows the various concepts of business. They got information about business and industry. Few students are started their own business and few students started small scale industries.
Economics	Students know the knowledge of economic planning. Market situation, demand and supply, determination of price of product, competition in market, import and export strategy, budgeting and economic policy of government.
Business Insurance	Students know the various policies of the insurance and investment scheme. For example life insurance, general insurance medic aim. Claim settlement process, documents and carrier options in insurance.

Marketing Research	Students got knowledge of marketing. Techniques and methods, data analysis, mechanism of market and carrier options in insurance. It is helpful for expand the market.
Advertising	Students know about various products available in the market. They know about the quality, quantity and price of the product. They also knows that the use of the product. Advertising is useful for the development of society and nation. It is helpful for to increase demand and supply. Advertising provide fund to various media.
Business Laws	Student got knowledge about various laws regarding business. For example bailment, mortgage, agency, negotiable, partnership firm act, and company act. etc. Contract procedure, birch of contract

## **Masters of Commerce**

### **Program outcome**

- ❖ The students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors.
- ❖ Student well versed in national as well as international trends.
- ❖ To provide in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment.
- ❖ Students with the knowledge, tools of analysis and skills with which to understand and participate in the modern business and economics world

### **Program Specific outcome**

- ❖ The Student are able to knowledge of business and the techniques of managing the business with special focus on marketing and Insurance.
- ❖ Ability to work in teams with enhanced communication and inter-personal skills.
- ❖ The students will be able for employment in functional areas like Accounting, Taxation, Banking.
- ❖ The Students are able to know ethical values, team work, leadership and managerial skills.
- ❖ Pursuing professional courses such as CA/ CS/ CMA/CFA.
- ❖ To create awareness in application oriented research through research for- business decisions.

### **M.COM. (MASTERS OF COMMERCE) (CHOICE BASED) SEM I and SEM II**

#### **COURSE OUTCOMES**

<b>SEMESTER I PROGRAME CODE: C00521</b>	
Subject / Course	Course Outcomes
Strategic Management	Students understand the basics of Strategic Management, levels of strategies and the use of it in the business organizations. Students understand the various strategies and how and why to formulate, implement and evaluate these strategies in the organizations.

	<p>Students get the information about corporate restructuring strategies, PPP and strategic alliance; hence students can learn the importance of these. Students get the knowledge about the BPO, KPO, Disaster Management, Start-up and Make in India.</p>
Cost and Management Accounting	<p>Students understand how cost are charged to particular product or service and learn to identify and evaluate difference between Actual and Targeted Cost.</p> <p>Students understand management decision making and get to know about profit maximization and cost minimization concepts.</p>
Economics for Business Decision	<p>Students acquire the knowledge of basic tools and economic theory and practical application and get familiarized with understanding of economic aspects of current affairs.</p> <p>Students are able to analyze Market Behavior with economic way of thinking and understand different economic principles in business decision</p>
Business Ethics and Corporate Social Responsibility	<p>Students become familiarized with the concept and relevance of Business Ethics in the modern era and understanding of the sources of Business Ethics, the approaches to Business Ethics and the Emergence of Business Ethics.</p> <p>Students are able to understand the distinct and timeless values, Indian Ethical Practices and the working of Ethics in various functional areas. Students are given an insight into the elements of Corporate Governance and the consequences of the failure of the Corporate Governance Mechanism and they are become acquainted with the scope and complexity of Corporate Social Responsibility in the Global and Indian context.</p>
<b>SEMESTER II PROGRAME CODE: C00522</b>	
RESEARCH METHODOLOGY	<p>The students understand the basics of Research, its formulation and also get the knowledge about formation of hypothesis and sampling and learn about, how to collect primary and secondary data with the help of questionnaire.</p> <p>Students understand the importance of data analysis and learn hypotheses through various Parametric &amp; Non-Parametric test and they also learn about the Research Reporting and Modern Practices in Research through the reference and citation methods.</p>
Corporate Finance	<p>Students get the understanding of appropriate capital structure for organization and the knowledge about various types of risk faced by organization.</p> <p>Students get the knowledge about various investment options available, cost and return associated with them and understanding of saving for future, considering the effect of inflation.</p>
Macro Economic Concepts and Application	<p>Students understand the concepts National Income and Human Development Index and understand basic Keynesian macroeconomics concepts such as ADF, ASF.</p> <p>Students get knowledge about Goods Market and Money Market with IS-LM curve and understand Monetary Policy and Fiscal Policy o</p>

E-Commerce	Students understand the concept of e-commerce with its type and its market benefits and also learn concept of E-commerce Sales life cycle. Students get acquainted with technical concept like domain name, its address and web site design principle and learn E-CRM concept with its use and benefits.
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### MASTERS OF COMMERCE (CHOICE BASED) SEM III and SEM IV

<b>SEMESTER III PROGRAME CODE: C00523</b>	
<b>Subject / Course</b>	<b>Course Outcomes</b>
Advance Cost Accounting	Students are able to interpret cost accounting statements and make them conversant with the basic vocabulary and mechanics of cost management and understand the concept and role of cost accounting in the business management of various manufacturing and non-manufacturing companies across countries through process costing, cost centre, revenue center etc. Students learn about cost accounting for cost management, planning and control through budgetary control and variance analysis through activity based costing and acquire decision making skill in cost accounting to the level where he or she can function effectively as a professional.
Advanced Financial Accounting	Students understand the provisions of AS-11 and the Translation of the Financial Statements of Foreign Branches and Learners understand the legal aspects of banking companies, format of final accounts, RBI guidelines, and preparation of final accounts of Banking Companies. Students understand the Revenue Account, Profit & Loss Account and Balance Sheet of Insurance companies and Re-insurance accepted and develop the knowledge about life insurance business and preparation of their Final Accounts.
Direct Taxation	Students get knowledge of the residential status of a person and learn the differentiation between taxable and non-taxable incomes. They are learn computing the total taxable income of oneself and analyze the tax payable and get practical exposure in computing taxation of Companies.
Project Work	
<b>SEMESTER IV PROGRAME CODE: C00524</b>	
Corporate Financial Accounting	Students acquire the skills to interpret accounting standards and understand the concept and role of cost accounting in valuation of the business and goodwill during amalgamation/ merger. Students learn and apply the basic principles, conventions and standards of financial accounting leading to the preparation of consolidated financial statements and they are able to interpret and analyze the Corporate Financial Reporting
Financial Management	Students understand the need, types and sources of finance and made aware of the importance of Capital Budgeting and different techniques of capital budgeting for decision making. Students understand the concept of working capital, cash management, receivable management, inventory management and its requirements and control policies and understand the concept of budgetary control its

	importance, limitations and preparation of different types of budget
Indirect Taxation	Students understand the history of GST all over the world and understand the ways of computing GST and Input Tax Credit. Students learn how to decide the place of taxation and learn the ways and means of registration under the Law
Project Work	

# **Faculty of Science**

## **Department of Botany**

### **Program & Course Outcome 2015 to 2020**

#### **B. Sc. BOTANY: PROGRAM OUTCOMES**

##### **Specific core discipline knowledge**

Students can recall details and information about the evolution, anatomy, morphology, systematics, genetics, physiology, ecology, and conservation of plants and all other forms of life.

Students can recall details of the unique ecological and evolutionary features of the local and Indian flora.

##### **Communication skills**

Students can communicate effectively using oral and written communication skills

##### **Problem solving and research skills**

Students can generate and test hypotheses, make observations, collect data, analyze and interpret results, derive conclusions, and evaluate their significance within a broad scientific context.

#### **B. Sc. BOTANY: PROGRAM SPECIFIC OUTCOMES**

To recognize and identify major groups of cryptogams and phanerogams and their phylogenetic relationships.

To understand the phylogeny of plants and study various systems of classification.

To explore the morphological, anatomical, embryological details as well as economic importance of algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.

To understand physiological processes and adaptations of plants.

To provide knowledge about environmental factors and natural resources and their importance in sustainable development.

To explain how current medicinal practices are often based on indigenous plant knowledge and to get introduced to different perspectives on treating ailments according to ethnomedicinal principles.

To understand patterns of heredity and variation among individuals, species and populations and apply principles for improvement of quality and yield.

To be able to apply statistical tools to gain insights into significantly different data from different sources.

To acquire recently published knowledge in molecular biology, such as rDNA technology; PTC and bioinformatics and their applications.



To be able to carry out phytochemical analysis of plant extracts and application of the isolated compounds for treatment of diseases.

To be able to deal with all microbes and the technologies for their effective uses in industry and mitigation of environmental concerns.

### **First Year**

#### **Semester I**

##### **Paper I: Plant Diversity I**

###### **USBO101 & USBOP1**

To understand the salient features of algae, life cycle patterns with a suitable example; to be able to identify them as well as economic importance of algae.

To learn the general characteristics and classification of fungi; life cycles patterns with a suitable example; to be able to identify them as well as their mode of nutrition and economic importance.

To learn the general characteristics and classification of bryophyta; life cycle pattern with a suitable example; to be able to identify them.

##### **Paper II: Form & function I**

###### **USBO102 & USBOP1**

To understand general structure of plant cell with respect to plant cell wall, plasma membrane, ultra-structure and functions of cell organelles like Endoplasmic reticulum and Chloroplast.

To understand energy pyramids, energy flow in an ecosystem, types of ecosystems such as aquatic and terrestrial.

To understand Mendelian and Non mendelian inheritance pattern and ratios.

### **Semester II**

##### **Paper I: Plant Diversity I**

###### **USBO201 & USBOP2**

To learn the general features and classification of pteridophyta; life cycle pattern with a suitable example, stelar evolution; to be able to identify them.

To learn the general features and classification of gymnosperms; life cycle pattern with a suitable example, economic importance; to be able to identify them.

To understand plant morphology with reference to leaf and inflorescence.

To provide plant description, distinguishing features of families so also identify and classify according to Bentham and Hooker's system.

**Semester II**  
**Paper II: Form & function II**  
**USBO202 & USBOP2**

To understand plant tissue types with special reference to epidermal tissue system and internal primary structure of angiosperms.

To understand mechanism of photosynthesis.

To understand concept of primary and secondary metabolites and difference between them.

To understand few medicinally important plants.

**Second Year**  
**Semester III**  
**Paper I: Plant diversity II**  
**USBO301 & USBOP3**

To provide general characters and economic importance of division Pheophyta; life cycle pattern with a suitable example; to be able to identify them.

To provide general characters of class Anthocerotae and Musci; life cycle patterns with a suitable example; to be able to identify them.

To understand taxonomy in relation to Anatomy, Palynology, Chemical constituents, Embryology, Cytology, Ecology.

To provide plant description, distinguishing features of families so also identify and classify according to Bentham and Hooker's system.

To understand modern techniques to study plant diversity like plant preservation, microscopy, chromatography and electrophoresis.

**Paper II: Form and function II**  
**USBO302 & USBOP3**

To understand ultra-structure of cell organelles like mitochondria, Peroxisomes, Glyoxysomes and Ribosomes; cell cycle and nucleic acids.

To understand variation in chromosome structure, sex determination, sex linked, sex influenced and sex-limited traits, sex determination and extranuclear genetics.

To understand DNA replication and protein synthesis in prokaryotes and eukaryotes.

**Paper III: Current trends in plant sciences I**  
**USBO303 & USBOP3**

To study Indian Herbal and Ayurvedic Pharmacopoeia with genuine medicinal plants and their possible adulterants.

To understand forest types of India, agro-forestry, urban forestry, organic farming, silviculture.  
To provide economic importance of plants w. r. t. fibres, spices and condiments.  
To understand concept of aromatherapy, botanical and nutraceuticals of few plants.  
To learn about enzyme industry and biofuels.

## **Second Year**

### **Semester IV**

#### **Paper I: Plant diversity II**

##### **USBO401 & USBOP4**

To understand general characters of Ascomycetae, life cycle pattern of suitable examples; to be able to identify them.  
To understand crop diseases with suitable examples.  
To learn classification, structure, method of reproduction, economic importance and ecological significance of lichens.  
To understand Salient features and classification of Psilophyta and Lepidophyta; life cycle pattern of suitable examples; to be able to identify them.  
To study Paleobotany w. r. t. the geological time scale; formation and types of fossils; structure and systematic position of form genus Rhynia.

#### **Paper II: Form and Function II**

##### **USBO402 & USBOP4**

To study normal Secondary Growth in Dicotyledonous stem and root, mechanical tissue system and types of vascular bundles.  
To study respiration, photorespiration, photoperiodism and vernalization.  
To study biogeochemical cycles, ecological factors and community ecology.

#### **Paper III: Current trends in plant sciences II**

##### **USBO403 & USBOP4**

To learn about basic principles of horticulture and gardening.  
To study various types of gardens.  
To get exposure to principles and techniques of plant tissue culture.  
To use statistical techniques as chi square test and coefficient of correlation.  
To understand basic principles behind bioinformatics and various tools used in it.

**Third Year  
Semester V  
Paper I: Plant diversity III  
USBO501 & USBOP5**

The students would be able:

- To gain knowledge about microbial diversity and techniques for culturing and visualization.
- To understand the salient features of three major groups of algae, their life cycle patterns with a suitable example; to be able to identify them.
- To learn the general characteristics and classification of two major groups of fungi along with life cycles of each group; to be able to identify them.
- To understand the scope and importance of Plant Pathology and apply the concepts of various control measures of commonly widespread plant diseases.

**Paper II: Plant diversity IV  
USBO502 & USBOP5**

The students would be able:

- To acquire knowledge of different fossil forms and understand their role in evolution.
- To provide plant description, describe the morphological and reproductive structures of seven families and also identify and classify according to Bentham and Hooker's system.
- To gain proficiency in the use of keys and identification manuals for identifying any unknown plants to species level.
- To relate anomalies in internal stem structure with function and appreciate the salient features of the root stem transition zone.
- To get exposure to pollen study and learn to apply it in various fields.

**Paper III: Form and function III  
USBO503 & USBOP6**

The students would be able:

- To acquire knowledge about two important organelles and molecular mechanisms of translation
- To understand water relations of plants, inorganic and organic solute transport, and apply the knowledge to manage mineral nutrition and survival in challenging abiotic stresses.
- To understand succession in plant communities and study remediation technologies in order to apply knowledge acquired for cleanup of polluted sites.
- To get exposure to principles and techniques of plant tissue culture and apply these studies for improving agriculture and horticulture and to become an entrepreneur.

**Paper IV: Current trends in plant sciences II  
USBO504 & USBOP6**

The students would be able:

- To get exposure to the technique of mushroom cultivation and explore the possibility of entrepreneurship in the same.
- To learn ethnobotanical principles, applications and utilize indigenous plant knowledge for the cure of common human diseases and improvement of agriculture.

To gain knowledge about the latest molecular biology techniques for isolation and characterization of genes.

To learn principles and application of commonly used techniques in instrumentation.

To gain proficiency in the monograph study and pharmacognostic analysis of six medicinal plants.

## **Semester VI**

### **Paper I: Plant diversity III**

#### **USBO601 & USBOP8**

The students would be able:

To identify, describe and study in detail the life cycles of three Bryophytes.

To and study in detail classification and general characters of three classes of Pteridophytes and identify as well as describe the life cycles of one example from each class.

To study evolutionary aspects and economic utilization of Bryophytes and Pteridophytes.

To identify, describe and study in detail the life cycles of three Gymnosperms.

### **Paper II: Plant diversity IV**

#### **USBO602 & USBOP8**

The students would be able:

To study contribution of Botanical gardens, BSI to Angiosperm study and provide plant description, describe the morphological and reproductive structures of seven families.

To gain exposure to a phylogenetic system of classification.

To gain insight into the anatomical adaptations of different ecological plant groups.

To understand development plant of male and female gametophytes, embryonic structure and development.

To understand the different aspects and importance of Biodiversity and utilize them for conservation of species so as to prevent further loss or extinction of Biodiversity and preserve the existing for future generations.

### **Paper III: Form and function III**

#### **USBO603 & USBOP9**

The students would be able:

To study various plant biomolecular structures and appreciate the structures, role, functions and applications of enzymes.

To gain insight into the Nitrogen and plant hormone metabolism with applications of the same in agriculture and horticulture.

To understand principles of genetic mapping , mutations and solve problems based on them, gain knowledge of various metabolic disorders and their implications.

To generate and test hypotheses, make observations, collect data, analyze and interpret results, derive conclusions, and evaluate their significance within a broad scientific context, using suitable statistical techniques.

**Paper IV: Current trends in plant sciences II**  
**USBO604 & USBOP9**

The students would be able:

To gain insight into recent molecular biology techniques for DNA analysis and amplification and Barcoding techniques and applications therein.

To understand and apply tools of Bioinformatics for data retrieval and phylogenetic analysis.

To learn about the sources of economically important plants in the field of fats and oils and apply it for extraction, dealing with entrepreneurship in the field.

To gain knowledge and proficiency in preservation of post-harvest produce and explore the possibility of entrepreneurship in the field.

**Department of Chemistry**

**Program & Course Outcome 2015-6 to 2019-20**

**Program Outcomes**

- 01.** Explaining the basic scientific principles and methods.
- 02.** To inculcate the scientific temperament in the students and outside the scientific community.
- 03.** Ability to handle the unexpected situation by critically analyzing the problem.
- 04.** Understanding the issues related to nature and environmental contexts and sustainable Development.
- 05.** Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
- 06.** Solve the problem and also think methodically, independently and draw a logical conclusion.
- 07.** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
- 08.** Find out the green route for chemical reaction for sustainable development.
- 09.** Use of modern techniques, decent equipment's and Chemistry software's (like. Chemdraw)

### Program Specific Outcome

1. knowledge about the fundamentals and applications of chemical and scientific Theories.
2. Every branch of Science and Technology is related to Chemistry.
3. Easily assess the properties of all elements discovered.
4. Apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries.
5. Will become familiar with the different branches of chemistry like analytical, organic, inorganic, physical, environmental, polymer and biochemistry.
6. Helps in understanding the causes of environmental pollution and can open up new methods for environmental pollution control.
7. Develops analytical skills and problem solving skills requiring application of chemical principles.
- 8 Acquires the ability to synthesize, separate and characterize compounds using laboratory and Instrumentation techniques.
9. Increasing working knowledge of instruments.
11. Social awareness about the quality of water.
12. Increasing the practical skill of the students
13. Awareness about plastic garbage.

### Course Outcome

<b>Course Name</b>	<b>Course code</b>	<b>Outcome</b>
Chemistry Paper I	USCH101	Understand the term Rate of Reaction, Understand the term of analytical chemistry tools and measurement Units & calculations. Understand the term Chemical Thermodynamics, Atomic structure, Periodic Table and periodicity Basics of Organic Chemistry
Chemistry Paper II	USCH102	Understand Atomic Structure, Quantum numbers, Periodic Table and Periodicity in the Properties, Chemical Bonding and VSEPR Theory Understand the Concepts of Qualitative Analysis, Bonding and Structure of Organic Compounds, Types of Arrows and Aromaticity Understand the Nomenclature of Organic Compounds, Fundamentals of Organic Reaction Mechanisms, Concept of Carbon Acid, Reagents and Recent Trends in Chemistry

Chemistry Practical	USCHP1	Determine the: i) Rate constant for the hydrolysis of ester; ii) Rate constant for the saponification and iii) Enthalpy of dissolution of salts Determine the i) amount of given solid mixture titrimetrically and ii) percentage composition of given mixture gravimetrically Analyze the sample containing two cations and two anions qualitatively (semi-micro) Understand the crystallization and Characterisation of given organic compound
Chemistry Paper I	USCH 201	Understand the Gaseous State, Nuclear Chemistry, Buffers, Oxidation & Reduction, Introduction to Gravimetric Analysis and Titrimetric Analysis. Gaseous State, Chemical Equilibria and Thermodynamic Parameters, Concept of Qualitative Analysis, Acid Base Theories, Chemistry of Aliphatic Hydrocarbons.
Chemistry Paper II	USCH202	Understand the Comparative Chemistry of Main Group Elements and Comparative Chemistry of Carbides, Nitrides, Oxides and Hydroxides of Group-I and II Elements Understand the Acid-Base Theories and Stereochemistry of organic Compounds Understand the Mechanism of organic reactions and Functional group interconversions
Chemistry Practical	USCHP2	i) Standardize the commercial samples of base and acid; ii) Study the reaction and balancing the reaction and iii) Study the kinetics of the reaction Determine the i) acetic acid in Vinegar titrimetrically; ii) Strength of acid; iii) amount of Mg (II) and Fe (II) in the given solution by complexometrically and titrimetrically respectively. Study Inorganic Preparations and Volumetric Analysis Perform the Characterisation of given organic compound
Physical Chemistry Paper I	USCH301	Understand the term Chemical Thermodynamics, Photochemistry Chemical Kinetics, Electrochemistry, Titrimetric Analysis, Titrimetric Analysis, Separation Techniques, Nuclear Chemistry, Liquid State, Phase Equilibria, Molecular Spectroscopy, Statistical Treatment of Analytical Data.
Chemistry Paper - II	USCH302	i)To understand concepts like free energy, Helmholtz free energy, Gibb's free energy, Gibb's Duhem equation, Van't of reaction isotherm and Isochore ii) Photochemical phenomenon (fluorescence, phosphorescence, chemiluminiscence, ozone depletion) & also opposing, consecutive, parallel reaction, thermal chain reaction & effect of temperature on rate of reaction. iii)To understand Kohlrausch's law and its application & other theory like Arrhenius theory of electrolyte, Debye Huckel theory & how to construct titration curve, choice of indicator.



		iv)To know complexometric titration of EDTA & separation techniques (solvent extraction).
Chemistry Paper - III	USCH303	This paper deals with the basics of Analytical chemistry, sampling, statistical treatment of analytical data, chemical analysis, separating components from a given sample, basic concepts like pH, experimental techniques like Titrimetry, Gravimetry, using instruments to carry out analysis, the various techniques like potentiometry, chromatography, electrophoresis, spectrometry. Instrumentation in general is felt to be of interest to learners of various branches like physics, botany, zoology, and microbiology.
Chemistry Practical I	USCHP1	To impart various skills of handling chemicals, reagents, apparatus, instruments and the care and safety aspects involved in such handling To make the learner capable of analyzing and interpreting results of the experiments he conducts or performs
Chemistry Practical II	USCHP2	To impart various skills of handling chemicals, reagents, apparatus, instruments and the care and safety aspects involved in such handling To make the learner capable of analyzing and interpreting results of the experiments he conducts or performs
Chemistry Practical III	USCHP3	To impart various skills of handling chemicals, reagents, apparatus, instruments and the care and safety aspects involved in such handling To make the learner capable of analyzing and interpreting results of the experiments he conducts or performs
Physical Chemistry Paper I	USCH 401	Electrochemistry, Nuclear Chemistry, Liquid State Phase Equilibria, Molecular Spectroscopy Statistical Treatment of Analytical Data, Titrimetric Analysis.
Chemistry Paper - II	USCH402	i)To understand concepts transport no, ionic conductance & it's relation, binding energy, binding energy curve, binding energy per nucleon, magic number, odd-even no. rule, N/P ratio, mass defect of nucleus, & also surface tension, viscosity, liquid crystal. ii)To understand liquid-liquid mixture, Raoult's law' ideal & non-ideal solution
Chemistry Practical III	USCH403	This paper deals with the basics of Analytical chemistry, sampling, statistical treatment of analytical data, chemical

		analysis, separating components from a given sample, basic concepts like pH, experimental techniques like Titrimetry, Gravimetry, using instruments to carry out analysis, the various techniques like potentiometry, chromatography, electrophoresis, spectrometry. Instrumentation in general is felt to be of interest to learners of various branches like physics, botany, zoology, and microbiology.
Chemistry Practical I	USCHP4	To understand how to determine order of reaction, conductometric titration of strong acid & base, organic preparation, organic estimation, inorganic quantitative & qualitative analysis, organic preparation, characterized organic compound containing only C, H, O element & to know how to determine molar absorptivity, surface tension, viscosity and how to use of analytical instruments.
Chemistry Practical II	USCHP5	To understand how to determine order of reaction, conductometric titration of strong acid & base, organic preparation, organic estimation, inorganic quantitative & qualitative analysis, organic preparation, characterized organic compound containing only C, H, O element & to know how to determine molar absorptivity, surface tension, viscosity and how to use of analytical instruments
Chemistry Practical III	USCHP6	To understand how to determine order of reaction, conductometric titration of strong acid & base, organic preparation, organic estimation, inorganic quantitative & qualitative analysis, organic preparation, characterized organic compound containing only C, H, O element & to know how to determine molar absorptivity, surface tension, viscosity and how to use of analytical instruments
Physical Chemistry	USCH501	Student able to understand the term Colligative Properties of Dilute Solutions, Phase Rule Surface Chemistry & Catalysis, Electrochemistry, Electrochemical cells, Introduction to Polymers, Crystalline State.
Inorganic chemistry	USCH502	i)To understand symmetry element, symmetry operation & how to assign point group to given molecule, MOT for CO, NO, HCL, H <sub>3</sub> , H <sub>3</sub> <sup>+</sup> , BeH <sub>2</sub> , H <sub>2</sub> O molecules. ii)To understand concept crystal lattice, lattice point, unit point, unit cell, lattice constant & different packing of rigid sphere (hcp, ccp), packing density (bcc, fcc, simple cubic), term superconductivity & it's application. iii)To understand chemistry of lanthanides, occurrence it's application iv) To know acidity and basicity of mono, polyatomic cation & anionaqueous & non-aqueous solvents liquid ammonia, dinitrogen tetra oxide w.r.to acid-base reaction, redox

		reaction
Organic Chemistry	USCH503	<p>Understand the Mechanism of Organic Reactions (Elimination reactions, Tetrahedral mechanism and Rearrangements)</p> <p>Understand the Stereochemistry (Chirality, symmetry elements, cycloalkanes, stereo selectivity and stereo specificity, stereochemistry of substitution and addition reactions)</p> <p>Understand the Carbohydrates (Introduction, monosachharides, open chain configurations, reactions) and IUPAC Nomenclature (Bicyclic, Biphenyls, Cummulenes)</p> <p>Understand the Heterocyclic Chemistry of Pyrrole, Thiophene and Furan and Organic Synthesis (Multi-component reactions and Newer methods)</p>
Analytical chemistry	USCH504	<p>This paper deals with the basics of Analytical chemistry, sampling, statistical treatment of analytical data, chemical analysis</p> <p>separating components from a given sample, separating methods like paper chromatography, TLC, HPLC, HPTLC</p> <p>an understanding of major concepts,theoreticalprinciples and experimental findings in Optical methods such as AAS, AES, Fluorimetry, phosphorimetry, turbidimetry, nephelometry</p> <p>interpret the complexometric titrations.</p> <p>interpret the redox titrations.</p> <p>interpret the precipitation titrations.</p> <p>express the titrimetric analysis methods.</p> <p>expresses the terms such as standard solution, titration, back titration, equivalence point, end point, primary and secondary standard.</p> <p>solves volumetric calculations.</p>
Physical Chemistry Practical	USCHP01	<p>Understand the molecular weight calculation by Rast Method, the order between <math>K_2S_2O_8</math> and KI by fractional change method, the adsorption of acetic acid on activated charcoal by using Freundlich adsorption isotherm and understand the handling of instruments and correct calculation by using different instruments.</p>
Inorganic Chemistry Practical	USCHP05	<p>To understand how to prepare inorganic complex and to know about terms related with co-ordination compound and how to estimate and analyze by iodometric, complexmetric titration</p> <p>To understand how to prepare inorganic complex of copper, iron, nickel, aluminium and determine percentage of purity</p>

		of the given water-soluble salt and qualitative analysis of water-soluble salts w. r. to added cation / anion.
Organic Chemistry Practical	USCHP09	Separate and Identify the Binary solid-solid mixture
Analytical Chemistry Practical	USCHP13	the ability to use modern instrumentation like potentiometer, colorimeter, turbidimeter, pH meter for chemical analysis and separation the ability to perform redox titrations, complexometric titrations a familiarity with, and application of safety and chemical hygiene regulations and practices an ability to work effectively in diverse teams in laboratory
Environmental Science & Pollution (Theory) Paper-V	USACEVS501	Understand the term Introduction to Environment and Pollution, Green chemistry and Sustainability, Alternate Energy Resources, Applications of Analytical Methods.
Physical Chemistry	USCH601	Molecular Spectroscopy, Basics of Quantum Chemistry Applied Electrochemistry, Renewable Energy Sources, Nuclear Magnetic Resonance Spectroscopy, Chemical Kinetics, Nuclear Chemistry. +
Inorganic chemistry	USCH602	i)To understand VBT, CFT (Co-ordination no. 2 - 6) w.r.to splitting of d orbital, ligand field effect, Jahn- Teller distortion, CFSE value calculation (1 – 10) & it's limitations. ii)To understand how to make MOT for co-ordination compounds & to understand thermodynamic & kinetic stability of complex, Inert & labile complex, ligand substitution reaction, acid hydrolysis, base hydrolysis, anation reaction & concept like electronic microstates, terms, term symbol for transition metal ion, ground state term & their rule in detail iii)To understand characteristics of organometallic compound and their synthetic method (oxidative - addition, transmetallation, carbanion - halide exchange, metallation, methylene insertion reactions) iv)To understand properties, structure, bonding, application of borazine, BOD, COD, TOC, aerobic & anaerobic process, nanomaterials, gastrointestinal agent & topical agent
Organic Chemistry	USCH603	Understand the Spectroscopy (UV-Visible, IR, PMR, Mass and Spectral characterisation and structural elucidation) Understand the Polymers (Classification, Stereochemistry, preparation and uses) and Photochemistry (Jablonski diagram, photochemistry of carbonyl compounds)

		<p>Understand the different Catalysts, Reagents and Natural Products</p> <p>Understand the Organometallic Chemistry (Mg, Li and Zn) and Chemistry of some Important Biomolecules (amino acids, polypeptides and nucleic acids)</p>
Analytical chemistry	USCH604	<p>interpret the potentiometric titrations, concept of DC Polarography, amperometric titrations</p> <p>an understanding of major concepts, theoretical principles and experimental findings in food and cosmetic chemistry.</p> <p>an understanding of separating components from a given sample using separating methods like GC, Ion exchange chromatography, size exclusion chromatography</p> <p>an understanding of major concepts, theoretical principles and experimental findings in thermal methods like DTA, TGA. Thermometric titration, Radioanalytical technique i.e. NAA.</p>
Physical Chemistry Practical	USCHP02	<p>Students able to understand calculate order of reaction, viscosity measurements, and understand the handling of instruments and correct calculation by using different instruments.</p>
Inorganic Chemistry Practical	USCHP06	<p>To understand how to prepare inorganic complex and to know about terms related with co-ordination compound and how to estimate and analyze by iodometric, complexometric titration</p> <p>To understand how to prepare inorganic complex of copper, iron, nickel, aluminium and determine percentage of purity of the given water-soluble salt and qualitative analysis of water-soluble salts w. r. to added cation / anion.</p>
Organic Chemistry Practical	USCHP10	<p>Separate and Identify the Binary mixtures containing (VL + NVL) &amp; (S + VL) components and Organic Preparations (Derivatives-Acetyl, Nitro, Ether, ester hydrolysis and oxidation</p>
Analytical Chemistry Practical	USCHP14	<p>the ability to use modern instrumentation like potentiometer, colorimeter, turbidimeter, pH meter for chemical analysis and separation</p> <p>the ability to perform redox titrations, complexometric titrations</p> <p>a familiarity with, and application of safety and chemical hygiene regulations and practices</p> <p>an ability to work effectively in diverse teams in laboratory</p>
Environmental Science & Pollution (Theory) Paper-V	USACEVS601	<p>Business Analytics of Environmental Testing, Ecological restoration, Climate Change, Environmental Education &amp; Legislation.</p>

## Department of Physics

### Program & Course Outcome 2015 to 2020

#### Program Outcome

<p>Program Name: <b>Bachelor of Science</b></p>	<p><b>Program Outcomes:</b> Student seeking admission for B.Sc. program is expected to get knowledge in some fundamental subject like Physics, Chemistry, Mathematics, Biology etc. Students get basic understanding of this field and a creative attitude towards it. Students can gain some in-depth knowledge of</p> <ul style="list-style-type: none"><li>a. Technology in all scientific fields.</li><li>b. Methodology behind the course to improve overall productivity.</li><li>c. What Specialization should they take during their master's degree course!</li><li>d.</li></ul>
<p>Program Specific Name: <b>B.Sc. in Physics</b></p>	<p><b>Program Specific Outcomes:</b></p> <p>On completion of the B. Sc. (Physics) program,</p> <ul style="list-style-type: none"><li>1. Students will be able to understand theories &amp; principles of physics, which include mathematical methods, electromagnetism, Atomic and molecular spectra, Electrodynamics, electronics, thermodynamics, &amp; Nuclear physics, quantum mechanics solid state.</li><li>2. Learn the Concept of Quantum Mechanics, Relativity, introduced at degree level in order to understand nature at atomic levels. Provide knowledge about material properties and its application for developing technology to ease the problems related to society..</li><li>3. Understand physical properties chemical bonds in crystallography its structures and dynamics.</li><li>5. Analyze the application of mathematics to problem in physics &amp; development of mathematical method suitable for such application &amp; for formulation of physical theories.</li><li>6. Learn the structure of solid materials &amp; their different physical properties along with mechanics, Dynamics, electronics, optics &amp; material science.</li></ul> <p><b>On completion of the B. Sc. Practical's program,</b> students will be able to</p> <ul style="list-style-type: none"><li>1. Understand Basic Circuits using Active Devices, Analog Circuits and their applications using Active Devices.</li><li>2. Learn basic test instruments such as power supply, function generator, CRO and their construction and working principle. understand Basic differential amplifier and their</li></ul>

	<p>applications in linear Integrated circuits</p> <p>3. Design &amp; conduct experiments as well as to analyze data and its interpretation.</p> <p>4. Design a system component on bread board or process to meet desired needs within realistic constraints such as economic environmental, social, political, ethical, health &amp; safety.</p> <p>5. Understand the fundamental concept of semiconductor like crystal structure, energy band gap, charge carrier statistics.</p>
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### Course Outcome

Course Name	Course code	Outcome
Classical Physics	USPH-101	<p>1. Learn the basics of properties of matter, stress, strain, how Young's modulus and rigidity modulus are defines, how they are evaluated for different shapes of bodies that can solved using their practical of determination.</p> <p>2. Learn the fundamentals of fluid dynamics using their different equations like Bernoulli's and Poiseuilles and studied types of flows.</p> <p>3. Study the lens maker formula, focal lengths, types of Aberrations, types of Eye pieces .Lens combination and its practical correlations with the content.</p> <p>4. Study the interference, thin films, fringes in wedge shaped films and grasped with numerical.</p> <p>5.Study-the-behaviour-of – gases, Thermodynamics their laws, Heat capacity indicator diagrams, and grasp the significance of terms like path function and work done during thermal processes.</p>
Modern Physics	USPH-102	<p>1.To develop analytical abilities towards real world problems</p> <p>2.To familiarize with current and recent scientific and technological developments</p> <p>3. To enrich knowledge through problem solving, hands on activities, study visits, projects etc.</p> <p><b>Learning Outcomes:</b></p> <p>1. Understand nuclear properties and nuclear behavior.</p> <p>2. Understand the type isotopes and their applications.</p> <p>3. Demonstrate and understand the quantum mechanical concepts.</p> <p>4. Demonstrate quantitative problem solving skills in all the topics covered</p>

Practical I	USPH-P-01	<ol style="list-style-type: none"> <li>1. To demonstrate their practical skills.</li> <li>2. To understand and practice the skills while doing physics practical.</li> <li>3. To understand the use of apparatus and their use without fear.</li> <li>4. To correlate their physics theory concepts through practical.</li> <li>5. Understand the concepts of errors and their estimation</li> </ol>
Mathematical Physics	USPH-201	<ol style="list-style-type: none"> <li>1. Understand the basic mathematical concepts and applications of them in physical situations.</li> <li>2. Demonstrate quantitative problem solving skills in all the topics covered.</li> </ol>
Electricity and Electronics	USPH-202	<ol style="list-style-type: none"> <li>1. Design a circuit involving basic electronic components such as resistors, capacitors, inductors, op-amps, transistors and logic gates. <ol style="list-style-type: none"> <li>1. Design a system with digital circuits.</li> <li>2. Design a system with multiple interacting circuits.</li> <li>3. Design a complex system with multiple circuits while satisfying numerous requirements and constraints.</li> </ol> </li> </ol>
Practical II	USPH-P-02	<ol style="list-style-type: none"> <li>i) To demonstrate their practical skills.</li> <li>ii) To understand and practice the skills while doing physics practical.</li> <li>iii) To understand the use of apparatus and their use without fear.</li> <li>iv) To correlate their physics theory concepts through practical.</li> <li>v) Understand the concepts of errors and their estimation</li> </ol>
Mechanics and thermodynamics	USPH-301	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> <li>i) Understand the concepts of mechanics &amp; properties of matter &amp; to apply them to problems.</li> <li>ii) Comprehend the basic concepts of thermodynamics &amp; its applications in physical situation.</li> <li>iii) Learn about situations in low temperature.</li> <li>iv) Demonstrate tentative problem solving skills in all above areas.</li> </ol>
Vector calculus ,Analog	USPH-	1) Understand the basic concepts of mathematical physics



Electronics	302	<p>and their applications in physical situations.</p> <p>2) Understand the basic laws of electrodynamics and be able to perform calculations using them.</p> <p>3) Understand the basics of transistor biasing, operational amplifiers, their applications</p> <p>4) Understand the basic concepts of oscillators and be able to perform calculations using them.</p> <p>5) Demonstrate quantitative problem solving skill in all the topics covered.</p>
Applied Physics - I	USPH-303	<p>i) Students will be exposed to contextual real life situations.</p> <p>ii) Students will appreciate the role of Physics in 'interdisciplinary areas related to materials, Bio Physics, Acoustics etc.</p> <p>iii) The learner will understand the scope of the subject in Industry &amp; Research.</p> <p>iv) Experimental learning opportunities will foster creative thinking &amp; a spirit of inquiry.</p>
Practical course -3 (Group A,B,C and Skill)	USPH-P-03P	<p>On successful completion of this course students will be able to :</p> <p>i) Understand &amp; practice the skills while performing experiments.</p> <p>ii) Understand the use of apparatus and their use without fear &amp; hesitation.</p> <p>iii) Correlate the physics theory concepts to practical application.</p> <p>iv) Understand the concept of errors and their estimation.</p>
Optics and Digital Electronics	USPH-401	<p>1) Understand the diffraction and polarization processes and applications of them in physical situations.</p> <p>2) Understand the applications of interference in design and working of interferometers.</p> <p>3) Understand the resolving power of different optical instruments.\</p> <p>4) Understand the working of digital circuits</p> <p>5) Use IC 555 timer for various timing applications.</p> <p>6) Demonstrate quantitative problem solving skills in all the topics covered.</p>
Quantum Physics	USPH-	

	402	<p>1) Understand the postulates of quantum mechanics and to understand its importance in explaining significant phenomena in Physics.</p> <p>2) Demonstrate quantitative problem solving skills in all the topics covered.</p>
Applied Physics - II	USPH-403	<p>i) Understand the concepts of mechanics &amp; properties of matter &amp; to apply them to problems.</p> <p>ii) Comprehend the basic concepts of thermodynamics &amp; its applications in physical situation.</p> <p>iii) Learn about situations in low temperature.</p> <p>iv) Demonstrate tentative problem solving skills in all above areas.</p>
Practical course - 4(Group A,B,C and Skill)	USPH-P-04	<p>On successful completion of this course students will be able to :</p> <p>i) Understand &amp; practice the skills while performing experiments.</p> <p>ii) Understand the use of apparatus and their use without fear &amp; hesitation.</p> <p>iii) Correlate their physics theory concepts to practical application.</p>
Mathematical Methods in physics , Thermal and Statistical Physics	USPH-501	<p>From this course, the students are expected to learn</p> <ol style="list-style-type: none"> <li>1. Some mathematical techniques required to understand the physical phenomena at the undergraduate level and get exposure to important ideas of statistical mechanics.</li> <li>2. The students are expected to be able to solve simple problems in probability,</li> <li>3. understand the concept of independent events and work with standard continuous distributions.</li> <li>4. The students will have idea of the functions of complex variables.</li> <li>5. Solve nonhomogeneous differential equations and partial differential equations using simple methods.</li> <li>6. The units on statistical mechanics would introduce the students to the concept of microstates, Boltzmann distribution and statistical origins of entropy.</li> </ol>

		It is also expected that the student will understand the difference between different statistics, classical as well as quantum.
Solid-state-physics	USPH-502	<p>Be able to account for interatomic forces and bonds, Have a basic knowledge of crystal systems and symmetries, crystalline materials are studied using diffraction, including concepts like structure factor, and scattering amplitude hkl value determination.</p> <p>2. Be able to perform structure determination of simple structures, understand the concept of reciprocal space and be able to use it as a tool know the significance of Brillouin zones</p> <p>3. Be able to calculate thermal and electrical properties in the free-electron model and know Bloch's theorem and energy band and distinction between metals, semiconductors and insulators</p> <p>4. Be able to estimate the charge carrier mobility and density. Be able to account for what the Fermi surface is and how it can be measured.</p> <p>5. To understand Lattice heat capacity and to compare Classical theory, Einstein's theory, Debye's theory of specific heat of solids. Students are able to understand crystal its systems, types</p> <p>6. Semiconductors its types conduction and characteristics were understood by students. Semiconductors its various characteristics were verified practically.</p> <p>7. Band theory periodic potential. Fermi energy, superconductivity understand by students</p> <p>8. Number of numerical are solved like susceptibility, vi characteristics, Design of circuits etc</p>
Physics paper III\ Atomic-an-molecular-physics	USPH-503	<p>Upon successful completion of this course, the student will understand</p> <ol style="list-style-type: none"> <li>1. the application of quantum mechanics in atomic physics</li> <li>2. the importance of electron spin, symmetric and antisymmetric wave functions and vector atom model</li> <li>3. Effect of magnetic field on atoms and its application</li> <li>4. Learn Molecular physics and its applications.</li> </ol> <p>This course will be useful to get an insight into spectroscopy.</p>
Electrodynamics	USPH-	1. Have gained elaborated knowledge about electrostatics

	504	<p>gauss laws divergence and curl; Poisson, Laplace equations, image problems ,different charge densities.</p> <p>2:Have gained ability to apply Poisson, Amperes and faradays laws in magnestostatics to find different potentials and electrostatics and magnestostatics fields</p> <p>3: Study in depth about Polarization, bound charges and boundary condition, energies infields.</p> <p>4. Using Maxwell equations students are able to understand interrelations and equivalence of E,D,B,H.</p> <p>5:To realize the importance of application of Blot Savarts Law and Amperes law. After Maxwell equations and formed continuity equations</p> <p>6:To understand the relevance of different magnetization and the boundary condition of magnetic field with electromagnetic waves in vacuum and matter using different form of wave and light equations.</p> <p>7. Number of numerical were solved after completion of every unit, these efforts give rise up confidence level.</p>
<p>Practical of course USPH501 + course USPH502</p> <p>Practical of course USPH503 + course USPH504</p>		<p><b>Knowledge Outcomes:</b>  Students able to understand fundamental knowledge of physics, including basic concepts and principles in thermodynamics &amp; mathematical (analytic and numerical) methods, Solid state Physics, Atomic and Molecular Physics, electrodynamics</p> <p><b>Professional Skills</b>  Students will acquired the following professional skills to deal with representative physics problems and situations at the undergraduate level:</p> <ol style="list-style-type: none"> <li>(1) Identifying the key factors and applying appropriate principles and assumptions in the formulation of physics problems;</li> <li>(2) Applying appropriate analytical and approximation methods;</li> <li>(3) Applying general experimental and measurement skills with prescribed procedures;</li> <li>(4) Analyzing experimental data and their level of uncertainty, and relating the experimental results with theoretical expectations;</li> <li>(5) Applying appropriate scientific programming skills;</li> <li>(6)Reporting the solutions to physics problems, experimental or project studies either orally or in</li> </ol>

	USPH505 USPH506	<p>written format</p> <p><b>Generic Competencies:</b></p> <p>Graduates should have acquired some generic skills in their study, including the following</p> <ol style="list-style-type: none"> <li>(1) identifying the key issues and attempting different methods in dealing with general problems;</li> <li>(2) manipulating precise and intricate concepts to construct logical arguments;</li> <li>(3) paying attention to the details and their logical relationships when analysing an issue;</li> <li>(4) evaluating an issue critically based on evidence and scientific principles;</li> <li>(5) being comfortable with numbers and analysing an issue quantitatively;</li> <li>(6) acquiring knowledge effectively by self-study and work independently;</li> <li>(7) working effectively in a team;</li> <li>(8) presenting information in a clear, concise and logical manner; and</li> <li>(9) having good time management skills.</li> </ol>
Classical Mechanics	USPH-601	<ol style="list-style-type: none"> <li>1. students are able to understand central force, Keplers law, co-ordinate system and laws of motion with types of pendulum.</li> <li>2. students are able to solve Lagrange's equations ,DAlemberts principle ,constraints and numericals,kinematics of moving fluids and eulers equation, tensor.</li> <li>3. students are able to understand Duffings equations, Chaos and types of Harmonic Oscillator</li> <li>4. overall understanding of concepts of equations of motion ,linear harmonic and nonlinear harmonic oscillator and their motions,chaos,dynamics kinematics of fluid intrigued fascinating interest to the students.</li> </ol>
Electronics	USPH-602	<ol style="list-style-type: none"> <li>1. Understand the basics of semiconductor devices and their applications. About SCR,JFET,MOSFET,UJT,OPAMP.</li> <li>2. Understand-operational-Amplifier-as an-instrumentation,comparater,filters of amplifier. Wave form generation.</li> <li>3. understand the basic concept of timing pulse generation and regulated power supplies</li> <li>4. Understand the basic of digital circuits, number of numerical are solved. good ideas and skill to solve numerical to design circuits.</li> </ol>
Nuclear Physics	USPH603	Upon successful completion of this course, the student

		<p>will be able to Understand the fundamental principles and concepts governing classical nuclear and particle physics and have a knowledge of their applications interactions of ionizing radiation with matter the key techniques for particle accelerators the physical processes involved in nuclear power generation. Knowledge on elementary particles will help students to understand the fundamental constituents of matter and lay foundation for the understanding of unsolved questions about dark matter, antimatter and other research oriented topics</p>
Relativity	USPH604	<p>This course introduces students to the essence of special relativity which revolutionized the concept of physics in the last century by unifying space and time, mass and energy, electricity and magnetism. This course also gives a very brief introduction of general relativity. After the completion of the course the student should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the significance of Michelson Morley experiment and failure of the existing theories to explain the null result.</li> <li>2. Understand the importance of postulates of special relativity, Lorentz transformation equations and how it changed the way we look at space and time, Absolutism and relativity, Common sense versus Einstein concept of Space and time.</li> <li>3. Understand the transformation equations for: Space and time, velocity, frequency, mass, momentum, force, Energy, Charge and current density, electric and magnetic fields.</li> <li>4. Solve problems based on length contraction, time dilation, velocity addition, Doppler effect, mass energy relation and resolve paradoxes in relativity like twin paradox etc.</li> </ol>
<p>Practical of course USPH601 + course USPH602</p> <p>Practical of course USPH603 + course USPH604</p>	USPH605 USPH606	<p><b>Knowledge Outcomes:</b> Students able to understand fundamental knowledge of physics, including basic concepts and principles Classical Mechanics, Electronics, Nuclear Physics , Relativity and experimental methods for physics.</p> <p><b>Professional Skills</b></p>

		<p>Students will acquired the following professional skills to deal with representative physics problems and situations at the undergraduate level:</p> <ol style="list-style-type: none"> <li>(1) Identifying the key factors and applying appropriate principles and assumptions in the formulation of physics problems;</li> <li>(2) Applying appropriate analytical and approximation methods;</li> <li>(3) Applying general experimental and measurement skills with prescribed procedures;</li> <li>(4) Analyzing experimental data and their level of uncertainty, and relating the experimental results with theoretical expectations;</li> <li>(5) Applying appropriate scientific programming skills;</li> <li>(6) Reporting the solutions to physics problems, experimental or project studies either orally or in written format</li> </ol> <p><b>Generic Competencies:</b></p> <p>Graduates should have acquired some generic skills in their study, including the following</p> <ol style="list-style-type: none"> <li>(1) identifying the key issues and attempting different methods in dealing with general problems;</li> <li>(2) manipulating precise and intricate concepts to construct logical arguments;</li> <li>(3) paying attention to the details and their logical relationships when analysing an issue;</li> <li>(4) evaluating an issue critically based on evidence and scientific principles;</li> <li>(5) being comfortable with numbers and analysing an issue quantitatively;</li> <li>(6) acquiring knowledge effectively by self-study and work independently;</li> <li>(7) working effectively in a team;</li> <li>(8) presenting information in a clear, concise and logical manner; and</li> <li>(9) having good time management skills.</li> </ol>
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### Department of Mathematics

**Program & Course Outcome 2015 to 2020**

**Program Outcome**

<p>Programme (Name) - B. Sc. Code- Sem-V[1S00145]; Sem-VI [1S00146]</p>	<p>The B.Sc. programme enabled the students to enhance their critical thinking, during the three year period of study and the curriculum stimulates the mental thoughts and assumptions of the students. Through practical's students have increased interest and practise in subject. This Analysis leads to take decisions at intellectual, organizational and personal from different perspectives of life. Most of the students are getting selected for placements in TCS.</p>
<p>Programme Specific Name- B. Sc. in Mathematics Code-</p>	<ol style="list-style-type: none"> <li>1. Students acquired the Knowledge of Differential Equations of first order and first degree Orthogonal Trajectories, Numerical Analysis various methods such as Newton Rapsion, Secant, Bairstov, Birge-Vieta, Interpolations-Lagrange's, Newton's forward and backward etc.</li> <li>2. Learns the concept of Groups, Subgroups, Understand the Concept of Real Numbers, Sequences, Continuous Functions, Differentiation and Reimann Integration.</li> <li>3. Mathematical literacy in vector spaces, pigeon-hole principle. Student learns and understand mathematical language.</li> <li>4. Learned to gain the Knowledge to apply the previous Knowledge on concept of cosets, Lagrange's theorem in group theory, ring theory.</li> <li>5. UG programs offer elective papers in the V and VI semesters, namely Numerical Analysis, Number Theory and Its applications, Graph Theory, Basic Concepts of Probability and Random Variables, Graph Theory and Combinatorics, Operations Research importance of human values, professional ethics, a better understanding on soft skills. It improved analytical skills, entrepreneurship and leadership qualities in the students. These concepts are self-directed and lifelong learning. The application of the learned skills by the candidates is everlasting context of socio-technological changes.</li> </ol>

### Course Outcome

S. N.	Course Name	Course code	Outcomes
<b>FYBSc</b>			
1	Calculus I	<b>USMT 101</b>	<p>On completion of this unit successfully students will able to:</p> <ol style="list-style-type: none"> <li>1. Have familiarity with Real Number System, sequence and properties</li> <li>2. Verify whether given functions are continuous.</li> <li>3. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from calculus</li> </ol>
2	Algebra	<b>USMT 102</b>	<ol style="list-style-type: none"> <li>1. Student will knows basic concepts of functions, set, finite set, types of relations, congruence and equivalence relations, polynomials over field and related theorems.</li> </ol>



			<p>2. Student can apply above concepts on the theorems as Euler's theorem, Fermat's theorem, Wilson theorem, Remainder theorem, Factor theorem.</p> <p>3. Student will solve problem on the basis of concepts and its applications (theorems) such as finding root of polynomials, evaluate properties of binary functions etc.</p>
3	Calculus II	<b>USMT 201</b>	<p>On completion of this unit successfully students will able to:</p> <ol style="list-style-type: none"> <li>1. Have familiarity with Series of real numbers.</li> <li>2. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from calculus</li> </ol>
4	Linear Algebra	<b>USMT 202</b>	<ol style="list-style-type: none"> <li>1. Student will knows basic concepts of types of systems of linear equations in Matrix form, Vector space, Subspaces, Basis and Dimensions.</li> <li>2. Students understand various methods of solving system of equations such as Echelon form, Gaussian elimination method, Rank-Nullity theorem.</li> <li>3. With the help of above concepts and necessities, Student can find various things such as linearly dependence/independence, basis set, Dimension of vector space, rank, kernel of linear transformation.</li> </ol>
5	Practicals based on USMT 101 & 102	<b>USMTP01</b>	<p>On completion of this unit successfully students will able to:</p> <ol style="list-style-type: none"> <li>1. Have familiarity with Real Number System, sequence and properties</li> <li>2. Verify whether given functions are continuous.</li> <li>3. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from calculus</li> <li>4. Student find relations: congruence and equivalence relations.</li> <li>5. Evaluate the examples on roots.</li> </ol>
6	Practicals based on USMT 201 & 202	<b>USMTP02</b>	<p>On completion of this unit successfully students will able to:</p> <ol style="list-style-type: none"> <li>1. Have familiarity with Series of real numbers.</li> <li>2. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from calculus.</li> <li>3. Solve matrix by methods Echelon form, Gaussian elimination method, Rank-Nullity theorem.</li> <li>4. Find the dimension of vector space, rank, kernel of linear transformation.</li> </ol>
<b>SYBSc</b>			
7	Calculus III	<b>USMT 301</b>	<p>On completion of this unit successfully students will able to:</p> <ol style="list-style-type: none"> <li>1. Understand scalar and vector field</li> <li>2. Differentiate scalar and vector field</li> <li>3. Apply these ideas to other areas of mathematics</li> </ol>
8	Algebra III	<b>USMT 302</b>	<ol style="list-style-type: none"> <li>1. Student will knows basic concepts of linear transformation, Rank-Nullity theorem, Row space, Column space, system of non-homogeneous equations, Determinants and its existence, general inner product space over R, Norm vector in IPS.</li> <li>2. Student understand results based on mentioned concepts above as existence of solution on <math>\text{rank}(A)=\text{rank}(A:B)</math>, existence of determinant by properties and Vandermonde's determinant, linear</li> </ol>

			dependence/independence using determinants, inner product of continuous real valued functions, Cauchy-Schwartz inequality etc. 3. Student will evaluate Rank, Dimension of basis. Area, Volume, IPS of examples, Orthogonal and orthonormal bases.
9	Discrete Mathematics	<b>USMT 303</b>	1. Student will know basic concepts of permutations and recurrence relations, Binomial and Multinomial Theorem, Pascal identity, Permutation and combination of sets and multi-sets, circular permutations, Principle of inclusion and exclusion, Finite and Infinite sets. 2. Student understands properties related to above concepts such as cycles, disjoint cycles, homogeneous and non-homogeneous recurrence relations, Addition and multiplication Principle, Stirling numbers of second kind, application of exclusion principle etc. 3. Student will evaluate problems based on above concepts and its properties such as rank and signature of a permutation, homogeneous recurrence relation of second degree using algebraic method, Simple recursion of $S(n; k)$
10	Practicals based on USMT 301, 302 & 303	<b>USMTP03</b>	On completion of this unit successfully students will be able to: 1. Understand scalar and vector field 2. Differentiate scalar and vector field 3. Apply these ideas to other areas of mathematics. 4. Evaluate determinant by properties and Vandermonde's determinant, linear dependence/independence using determinants etc. 5. Find Rank, Area, Volume. Examples of IPS. 6. Student will evaluate problems based on above concepts and its properties such as rank and signature of a permutation, homogeneous recurrence relation of second degree using algebraic method, Simple recursion of $S(n; k)$ . 7. Identify the cycles, disjoint cycles.
11	Calculus IV	<b>USMT 401</b>	On completion of this unit successfully students will be able to: 1. Demonstrate accurate and efficient use of Riemann integral 2. Have familiarity with Indefinite and improper integrals 3. Translate real life situations into symbolism of mathematics and find solution for the resulting models
12	Algebra IV	<b>USMT 402</b>	1. Student will know basic concepts of groups, subgroups, cyclic group and subgroups, cosets and its properties and group homomorphism's etc. 2. Student understands related theorems based on above concepts and properties namely Lagrange's theorem, Group homomorphism, order of element etc. 3. Student can show group, subgroup, cyclic group and subgroup, group homomorphism, order of element, Verify Lagrange's theorem.
13	Ordinary Differential Equations	<b>USMT 403</b>	1. Student will know basic concepts of differential equation, order, degree, ordinary differential equation and partial differential equation, linear and non-linear ODE. Homogeneous and non-homogeneous second order linear differentiable equation and numerical

			<p>differentiation &amp; integration.</p> <p>2. Student understands Wronskian and its properties, general solution of DE, Variation of parameters and Iterative methods.</p> <p>3. Student can find Wronskian and show it is LI/LD, C. F., P. I., general solution, Picard's method etc.</p>
14	Practical based on USMT 401, 402 & 403	<b>USMTP04</b>	<p>On completion of this unit successfully students will able to:</p> <p>1. Demonstrate accurate and efficient use of Riemann integral</p> <p>2. Have familiarity with Indefinite and improper integrals</p> <p>3. Translate real life situations into symbolism of mathematics and find solution for the resulting models.</p> <p>4. Student solves the properties of groups, subgroups.</p> <p>5. Verify Lagrange's theorem.</p> <p>6. Student finds Wronskian and shows its properties.</p> <p>7. Solve homogeneous, non-homogeneous method for ODEs.</p>
<b>TYBSc</b>			
15	Multivariable Calculus II	<b>USMT 501</b>	<p>On completion of this unit successfully students will be to:</p> <p>1. Solve double and triple integrals</p> <p>2. Handle Multiple, line and surface integral</p> <p>3. Translate real life situations into symbolism of mathematics and find solution for the resulting models</p>
7	Linear Algebra	<b>USMT 502</b>	<p>1. Student will know concepts of Quotient spaces, Orthogonal transformations and isometries, Characteristic polynomial, properties of a group, Diagonalizability, Geometric multiplicity and Algebraic multiplicity etc.</p> <p>2. Student will understand First Isomorphism theorem, Characterization of isometries as composites of orthogonal transformations and isometries, Orthogonal diagonalization, Lagrange's theorem, Centre of a group and Group homomorphism and isomorphism etc.</p> <p>3. Student will solve examples related to above theorems and understanding concepts such as finding basis of quotient space, Application to real quadratic forms. Positive definite, semi definite matrices, application of Cayley Hamilton Theorem, examples on cyclic groups &amp; subgroups, symmetric group <math>S_n</math>, Dihedral group <math>D_n</math>, Klein 4-group, Matrix groups, <math>GL_n(\mathbb{R})</math>, Examples and properties of Automorphisms of a group, inner automorphisms.</p>
2	Topology of Metric Spaces	<b>USMT 503</b>	<p>On completion of this unit successfully students will be to:</p> <p>1. Deal with various examples of metric spaces</p> <p>2. Have some familiarity with open and closed sets.</p> <p>3. Work with compact sets in Euclidean spaces</p>
8	Numerical Analysis I	<b>USMT 5A4</b>	<p>1. Student will know following methods as Newton-Raphson method, Secant method, Regula-Falsi method and their rate of convergence, Triangularization method, Cholesky method, Birge-vieta method, Graeffe's roots squaring method, Jacobi iteration method, Rutishauser method for arbitrary matrices, Power method, Inverse Power method, Muller method, Fixed point iteration method.</p> <p>2. Student will understand above mentioned methods theoretically well.</p>

			3. Student will solve the problems related to above stated method and can find rate of convergence, truncation error, eigen values, eigen vectors, Sturm sequence etc.
3	Elements Of Operations Research – I	<b>USACOR501</b>	On completion of this unit successfully students will be to: 1. Solve LPP problems using graphical method, Simplex method and Big-M method etc 2. Handle Dual Simplex Method 3. Have some familiarity with Uniform, Binomial, Poisson, Exponential, Normal Distribution
4	Practical based on USMT501 & USMT502	<b>USMTP05</b>	On completion of this unit successfully students will be to: 1. Solve double and triple integrals 2. Handle Multiple, line and surface integral 3. Translate real life situations into symbolism of mathematics and find solution for the resulting models. 4. Student proves Isomorphism theorems 5. Solve examples on Cayley-Hamilton theorem. 6. Can solve examples on cyclic groups & subgroups, symmetric group $S_n$ , Dihedral group $D_n$ , Klein 4-group, Matrix groups, $GL_n(\mathbb{R})$ .
5	Practical based on USMT503 & USMT5A4	<b>USMTP06</b>	On completion of this unit successfully students will be to: 1. Deal with various examples of metric spaces 2. Have some familiarity with open and closed sets. 3. Work with compact sets in Euclidean spaces 4. Solve various methods as Newton-Raphson method, Secant method, Regula-Falsi method 5. Find the rate of convergence prescribed methods. 6. Solve Triangularization method, Cholesky method, Birge-vieta method. 7. Find Sturm sequence etc
6	Practical based on USACOR501	<b>USACOR5P1</b>	On completion of this unit successfully students will be to: 1. Solve LPP problems using graphical method, Simplex method and Big-M method etc 2. Handle Dual Simplex Method 3. Have some familiarity with Uniform, Binomial, Poisson, Exponential, Normal Distribution
7	Basic Complex Analysis	<b>USMT 601</b>	On completion of this unit successfully students will be to: 1. Explain the fundamental concepts of complex analysis and their role in modern mathematics and applied contexts 2. Apply problem solving using complex analysis techniques applied to diverse situations in physics, engineering and other mathematical contexts
9	Algebra	<b>USMT 602</b>	1. Student will know concepts Normal subgroups of a group, Centre of a group, Quotient group, Alternating group $A_n$ , cycles, ring, ideal of ring, integral domain, prime ideal, polynomial ring, Euclidean domain (ED), Principal Ideal Domain (PID), Unique Factorization and its relations. 2. Student will understand First Isomorphism theorem, Cayley's

			<p>theorem, finite integral domain is a field, Characteristic of an integral domain, Irreducible polynomials over an integral domain. Unique Factorization Theorem for polynomials over a field, Characterization in terms of quotient rings.</p> <p>3. Student will solve examples based on above theoretical results and its properties such as Classification of groups of order <math>\leq 5</math>, examples on Characterization in terms of quotient rings, Units of a ring, multiplicative group of units of a ring.</p>
8	Topology of Metric Spaces and Real Analysis	<b>USMT 603</b>	<p>On completion of this unit successfully students will be to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate accurate and efficient use of Metric Spaces techniques.</li> <li>2. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from metric spaces</li> <li>3. Apply the ideas of metric spaces to other areas of mathematics</li> </ol>
10	Numerical Analysis II	<b>USMT 6A4</b>	<ol style="list-style-type: none"> <li>1. Student will know &amp; understands methods Lagrange's Linear, quadratic and higher order Interpolation, Iterated interpolation, Newton's divided difference interpolation, Finite difference operators, Interpolating polynomial using finite differences, Interpolation, Numerical differentiation, Trapezoidal rule, Simpson's rule.</li> <li>2. Student will solve examples based on above mentioned concepts and various numerical methods.</li> </ol>
9	Elements Of Operations Research – II	<b>USACOR601</b>	<p>On completion of this unit successfully students will be able to:</p> <ol style="list-style-type: none"> <li>1. Take decision under uncertainty using Laplace criterion, Maximax (Minimin) criterion etc.</li> <li>2. Have familiarity with Simple and compound interest</li> <li>3) Understand stock market.</li> </ol>
10	Practical based on USMT601 & USMT602	<b>USMTP07</b>	<p>On completion of this unit successfully students will be to:</p> <ol style="list-style-type: none"> <li>1. Explain the fundamental concepts of complex analysis and their role in modern mathematics and applied contexts</li> <li>2. Apply problem solving using complex analysis techniques applied to diverse situations in physics, engineering and other mathematical contexts.</li> <li>3. Student shows Quotient group, Alternating group <math>A_n</math>, cycles,</li> <li>4. In ring, find ideal of ring, integral domain, prime ideal, polynomial ring, maximal ideal etc.</li> <li>5. Shows Euclidean domain(ED), Principal Ideal Domain (PID), Unique Factorization.</li> </ol>
11	Practical based on USMT603 & USMT6A4	<b>USMTP08</b>	<p>On completion of this unit successfully students will be to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate accurate and efficient use of Metric Spaces techniques.</li> <li>2. Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concept from metric spaces</li> <li>3. Apply the ideas of metric spaces to other areas of mathematics.</li> <li>4. Solve examples on the methods Lagrange's Linear, quadratic and higher order Interpolation.</li> <li>5. Evaluate Iterated interpolation, Newton's divided difference interpolation.</li> <li>6. Solve examples on Numerical differentiation, Trapezoidal rule,</li> </ol>

			Simpson's rule.
12	Practical based on USACOR601	<b>USACOR6P1</b>	On completion of this unit successfully students will able to: 1. Take decision under uncertainty using Laplace criterion, Maximax (Minimin) criterion etc. 2. Have familiarity with Simple and compound interest 3) Understand stock market.