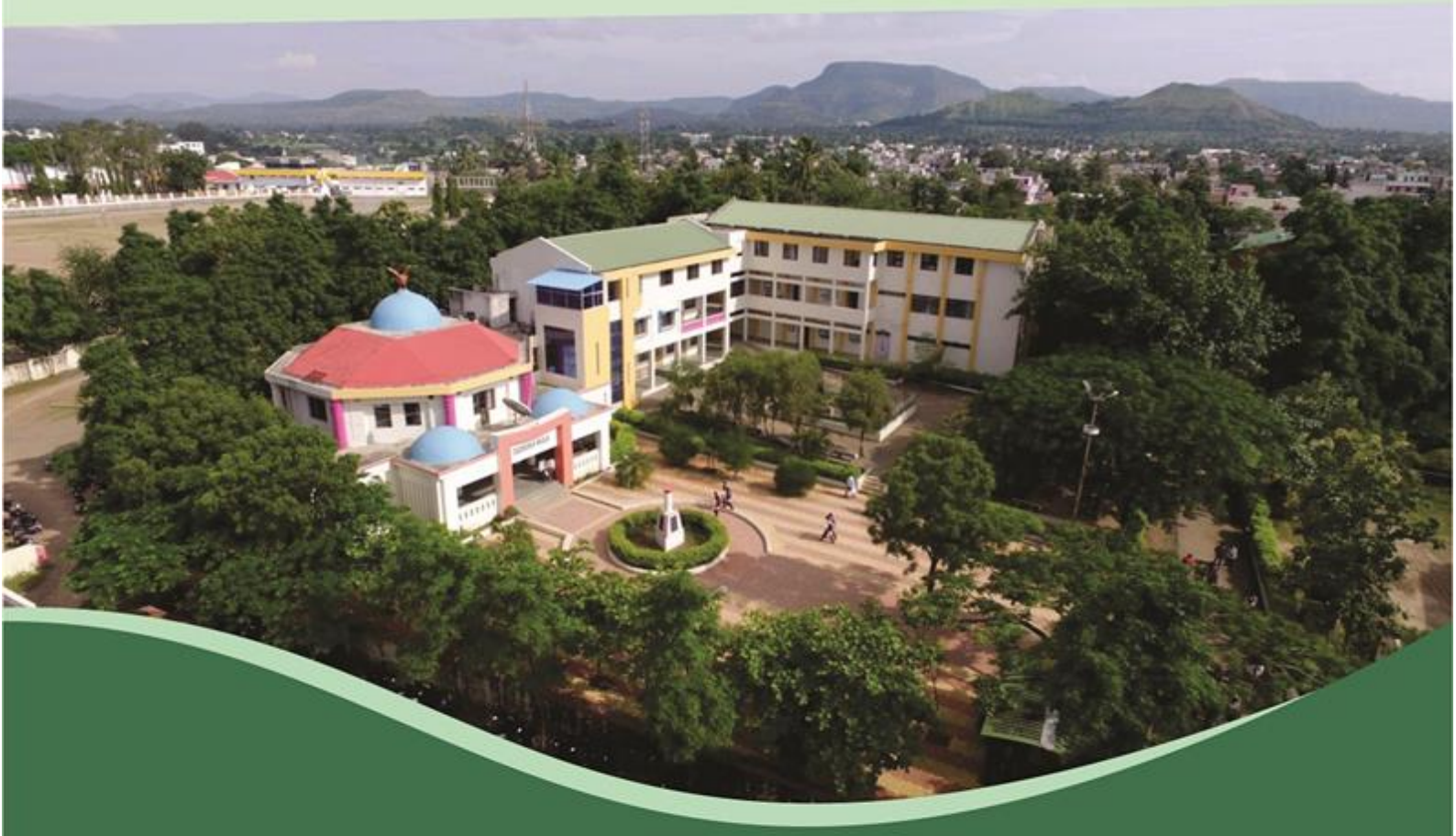
Akole Taluka Education Society's

Agasti Arts, Commerce and Dadasaheb Rupwate Science College, Akole

Tal.Akole, Dist.Ahmednagar - 422601 (Maharashtra)



Assessment and Accreditation

Criterion II

Teaching-Learning and Evaluation

2.6.1 : Programme Outcomes & Course Outcomes

Table of Contents

Programme Outcomes

Bachelor of Arts (B.A):

After completion of B.A. programme students will be able to:

1. Learn the field of humanities and language with conceptual clarity.
2. Become cultured and praiseworthy as a citizen of India
3. Secure employment/self-employment (entrepreneurship) opportunities.
4. Learn and adopt fundamental values /principles of Indian consciousness
5. Learn and adopt Communication and Soft Skills properly.
6. Become socially, politically, economically and culturally aware citizens.
7. Make his overall personality development.

Bachelor of Commerce (B.Com):

After completion of B.Com. programme students will be able to:

1. Learn and adopt specific skills like Planning, Controlling, Co-coordinating, Decisionmaking and communicating required in the Trade, Commerce and Industry.
2. Build the entrepreneurship and communication skills to become self-reliant citizen.
3. Prepare a business plan, set up and manage his/her own venture/project.
4. Maintain books of accounts of small-scale and medium-scale industrial units
5. Learn and comply with the Taxation and Legal procedures.
6. Contribute for growth and development of nation.

Bachelor of Science (B.Sc.):

After completion of B.Sc. programme, the students will be able:

1. Acquire knowledge with facts and figures related to various subjects in pure sciences.
2. Learn the basic concepts, scientific phenomena and their relevance in

the day to daylife.

3. Adopt the skills in handling scientific instruments, chemicals, glassware, planning andperformance in laboratory experiments.

4. Analyze the given scientific data critically and systematically and the ability to drawobjective conclusions.

5. Apply scientific temperament to address the social and global issues by sustainabledevelopment and solutions.

6. Contribute for growth and development of nation through scientific research.

Bachelor of Science in Wine, Brewing & Alcohol Technology

After completion of B.Sc. programme, the students will be able:

1. Understand the importance of wine, their types and its quality.
2. Achieve knowledge of wine making.
3. Understand contribution of wine in increase and improve our Health, Quality and production Methods
4. Understand marketing strategies of growers and wine makers.
5. Fundamentals, principles& practical skills and recent development in subject area.
6. Inspire and boost interest of student towards the wine technology as a main stream & Understand global market
7. Create foundation for advance studies, research & development in wine & vine.

Bachelor of Computer Science (B.Sc.Computer Science):

After completion of B.Sc. programme, the students will be able:

1. Learn the basic computing skills.
2. Develop the problem-solving abilities using a computer.
3. Build the necessary skill set and analytical abilities for developing computer basedsolutions for real life problems.
4. Acquire the necessary knowledge - base for Research in computer science.

5. Explore the opportunities in the area of Software development and testing, Game developing, application developing, technical architectural skills, web application developing, etc.
6. Contribute for growth and development of nation through research in IT.

Bachelor of Business Administration (B.B.A.)

After completion of B.B.A. programme, the students will be able:

1. To develop right understanding about the business environment and different types of organizations
2. To develop leadership aptitude to work independently and in the organized group.
3. To cultivate desired qualities of as effective a manger capable of taking decisions and communicating effectively with different types of publics
4. To develop a right understanding regarding various financial institutions and agencies governing aspects of business the business.

Bachelor of Business Administration in Computer Application (B.B.A-CA):

After completion of B.B.A. - C.A. programme, the students will be able:

1. Learn the basic computing skills.
2. Create network database administrator.
3. Develop a software program.
4. Become familiar for client-server systems.
5. Develop right skill oriented human resource.
6. Develop the spirit of entrepreneurship.

Master of Arts (M.A.):

After completion of M.A. programme, the students will be able:

1. Learn the importance of ethical values through literature, social and natural sciences.

2. Apply the human values/ethics in integrating the national growth.
3. Develop independent logical and critical thinking to achieve excellence.
4. Learn and develop communication and analytical skills.
5. Demonstrate proficiency in a range of techniques and media.

Master of Commerce (M.Com):

After completion of M. Com. programme, the students will be able:

1. Accept a variety of challenges in the Business Environment.
2. Develop independent logical thinking and thereby achieve his overall personality development.
3. Select and opt for the appropriate career in Management and Entrepreneurship.
4. Undertake various methods of data collection and its interpretation for the proper decision making in the Business Environment.
5. Develop and implement communication and analytical skills.

Master of Science (M.Sc.):

After completion of M.Sc. programme, the students will be able:

1. Communicate scientific results in writing as well as through oral presentations.
2. Acquire the scientific skills required to carry out independent research.
3. Undertake an advanced research project proficiently in his specialized area.
4. Develop problem solving skills, critical thinking and analytical reasoning as applied to scientific problems.
5. Appreciate the role of science in society; and its personal, social and global importance; and how society influences scientific research.

Course Outcomes

BA

FYBA

❖ English

Compulsory English

1) Exposed to the best prose and poetry.
2) Developed to think independently and critically
3) Got an idea about human values.

Optional English

1) Became familiar with literature and language
2) Got an information about phonology
3) Learnt skills for jobs

❖ मराठी

(प्रथम सत्र)

विषय : कथा आणि भाषिक कौशल्य विकास : मराठी साहित्य : (CC-1A)

१. कथा या साहित्य प्रकारची ओळख करून देणे .

२. कथा या साहित्य प्रकारचे स्वरूप .घटक आणि प्रकार यांची ओळख करून देणे ,

३. विविध साहित्य प्रवाहांमधील कथा या साहित्य प्रकारातील निवडक कथांचे अध्ययन करणे .

४. भाषिक कौशल्य विकास करणे .

(द्वितीय सत्र)

विषय : एकांकिका आणि भाषिक कौशल्य विकास : मराठी साहित्य : (CC-1A)

१. एकांकिका या साहित्य प्रकारची ओळख करून देणे .

२. एकांकिका या साहित्य प्रकारचे स्वरूप .घटक आणि प्रकार यांची ओळख करून देणे ,

३. विविध साहित्य प्रवाहांमधील एकांकिका या साहित्य प्रकारातील निवडक एकांकिकाचे अध्ययन करणे .

४. भाषिक कौशल्य विकास करणे.

❖ हिन्दी

पाठ्यक्रम : वैकल्पिक हिन्दी प्रश्नपत्र : 1 A - F.Y.B.A. (Hindi – G1)

१. छात्रो को हिन्दी काव्य साहित्य का परिचय देना |

२. हिन्दी कहानी साहित्य से अवगत कराना |

३. हिन्दी भाषा द्वारा संवाद कौशल विकसित करना |

४. मौलिक लेखन की ओर रुझान बढाना |

५. विज्ञापन लेखन कौशल विकसित करना |

६. अनुवाद संबंधी जानकारी देना |

७. हिन्दी कॉम्पुटर का परिचय देना |

८. निबंध लेखन कौशल को विकसित करना |

९. छात्रो को विज्ञापन लेखन से अवगत करना |

❖ History

Semester - I

Course: Early India: From Prehistory to the Age of the Mauryas

The history of Early India is a crucial part of Indian history. It is a base for understanding the entire Indian history. The course is aimed at helping the student to understand the history of early India from the prehistoric times to the age of the Mauryas. It attempts to highlight the factors and forces behind the rise, growth and spread of civilization and culture of India along with the dynastic history. It also attempts to help the students to understand the contribution of Early Indians to polity, art, literature, philosophy, religion and science and technology. It also aims to foster the spirit of enquiry among the students by studying the major developments in early Indian history.

Semester-II

Course: Early India: Post Mauryan Age to the Rashtrakutas

The history of India after the Mauryas is very important to understand the developments in early India after the Mauryas, which finally led to the transition to medieval India. The course is aimed at introducing the students to the developments in different parts of India through a brief study of regional kingdoms up to the tenth century C.E. It attempts to highlight the consequences of the foreign invasions, particularly on the polity, economy, society and art and architecture. The attempt is also to instill the spirit of enquiry among the students.

❖ Economics

Indian Economic Environment

1. To Understand the information about the Indian Economy
2. To Understand important of employment in Indian Economy
3. To Understand the important of Agriculture in Indian Economy

❖ Logics

Semester I & II

Course : Traditional Logic (Sem I)

Propositional Logic (Sem II)

1. Student is introduced logic ,and symbolic logic.
2. Students to acquire pleasure in logical thinking.
3. Students create awareness about the significance of logical thinking.
4. The student prepares for competitive exams.

❖ Philosophy

Semester I & II

Course : Introduction to Philosophy (Sem I)

Themes and issues in philosophy (Sem II)

1. The student becomes familiar with philosophy.
2. The student learns to philosophical Thinking.
3. To able to prepare students for university evaluation system and competitive examination.

❖ Political Science

G-1 General Paper

Introduction to Indian Constitution

1. To acqaint students with the important features of the constitution of India and with the basic framework of Indian goverment.
2. To familiarize students with the working of the constitution of India.

SYBA

❖ English

Compulsory English

1) Acquired skills of self- learning
2) Developed interest in literary pieces
3) Acquired linguistic competence.

General English (G-2)

1) Exposed to the short story as genre.
2) Became familiar with the beauty of language.
3) Studied and understood language and literature.

Special Paper (S-1)

1) Acquainted with drama.
2) Acquainted with the best British drama
3) Learnt aesthetics of drama

Special Paper (S-2)

1) Became familiar with poetry
2) Studied the best samples of English poetry
3) Became familiar with aesthetics of poetry

❖ मराठी

आधुनिक मराठी साहित्य आणि उपयोजित मराठी :(G-2)

१. शुद्धलेखनाची ओळख करून देणे .
२. पारिभाषिक संज्ञांची ओळख करून देणे .
३. चरित्र.आत्मचरित्र या साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान करून देणे-
४. आधुनिक मराठी साहित्यातील साहित्य प्रकारचे आकलन करून घेणे .

मराठी साहित्यातील विविध साहित्य प्रकार :(S-1)

१. मराठी साहित्य प्रकारांच्या तात्विक घटकांचे ज्ञान देणे .
२. वेगवेगळ्या कालखंडातील मराठीतील अभिजात साहित्य कृतींचा संस्कार घडविणे .
३. साहित्य कृतीला मुक्त प्रतिसाद देण्याची क्षमता विकसित करणे .
४. साहित्य कृतीचे आकलन .आस्वाद आणि मूल्यमापन करण्याची दृष्टी निर्माण करणे ,
५. पदव्युत्तर अभ्यास करण्याची पूर्वतय्यारी करणे .

अर्वाचीन मराठी वाडमयाचा इतिहास : (S-2)

१. विशेष स्तरावर अभ्यासाचा प्रारंभ होत असतानामराठी साहित्याच्या ऐतिहासिक परंपरेचे स्थूल ज्ञान , .देणे करून
२. विशिष्ट कालखंडाच्या पार्श्वभूमीवर साहित्य मागील प्रेरणा .प्रवृत्तीचे ज्ञान करून देणे ,

३. साहित्य प्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान करून देणे .

पदव्युत्तर अभ्यास करण्याची पूर्वतय्यारी करणे.

❖ हिन्दी

विशेष हिन्दी प्रश्नपत्र :1 (Hindi – S1)

१. छात्रो को भाषा की परिभाषा | विशेषताए तथा भाषा की विविध रूपो की जानकारी देना ,

२. छात्रो को हिन्दी की बोलीयो तथा भाषा विकास के प्रमुख वादो से परिचित करना |

३. छात्रो को राजभाषा हिन्दी के स्वरूप तथा राष्ट्रभाषा का प्रचार करनेवाली संस्थाओ से परिचित करना |

४. छात्रो मे भाषा के वैज्ञानिक अध्ययन की दृष्टी निर्माण करना |

५. भाषा विज्ञान के अंगो तथा भाषा विज्ञान की शाखाओ का परिचय कराना |

विशेष हिन्दी प्रश्नपत्र :2 (Hindi – S2)

१. हिन्दी उपन्यास एवं नाटक के विविध मानदण्डो के आधार पर छात्रो मे समिक्षण की क्षमता निर्माण करना |

२. छात्रो मे हिन्दी उपन्यास एवं नाटक के आस्वादन की क्षमता विकसित करना |

३. मध्ययुगीन संत एवं भक्तो के काव्य से छात्रो को परिचित कराना |

४. मध्ययुग के प्रतिनिधी कवियो से छात्रो को परिचित कराना |

सामान्य हिन्दी प्रश्नपत्र :2 (Hindi – G2)

१. छात्रो के हिन्दी के प्रतिनिधी कहानीकारो एवं कवियो से परिचित कराना |

२. छात्रो को हिन्दी कहानी एवं नई कविता की विशेषता से परिचित कराना |

३. छात्रो को हिन्दी के कार्यालयीन एवं व्यावहारिक पात्रो के स्वरूप का ज्ञान देना |

४. छात्रो को पारिभाषिक शब्दहिन्दी भाषा के व्यावहारिक क्षेत्र .साक्षात्कार लेखन आदी ,भेटवार्ता ,विज्ञापन , | से परिचित कराना

५. छात्रो को हिन्दी शब्दयुग्म का ज्ञान कराना |

❖ History

General Paper 2 : Modern- India (1857-1950)

The course is designed to help the student to know- History of freedom movement of India, aims, objectives problems and progress of Independent India. It aims at enabling the student to understand the processes of rise of modern India. The Course attempts to acquaint student with fundamental aspects of Modern Indian History. To explain the basic concepts/ concerns/ frame work of Indian History.

❖ Economics

Modern Banking

1. To Understand the information about the Bank
2. To Understand how money is made
3. To Understand the information of RBI

Micro Economics

1. Develop practical knowledge in own Economics Decision
2. To Understand Business Principal
3. To Learn basic Economics.

Macro Economics

1. To understand how the economy operates
2. To understand how Economics Principal Apply
3. To learn basics Economics Theory

❖ Logics

Logic and Principles of Reasoning

1. Student introduce principles and techniques of Axiomatic System, Predicate calculus, Rational Logic and Identity.
2. Students develop logical thoughts.

❖ Philosophy

Philosophy of Indian Saints

1. The student is introduced to Saintliterature.
2. A student's social views develop.

❖ Political Science

General Paper : Political Theory & Concepts

This is an introductory paper to the concepts. Ideas and thearies in political theary it seeks to explain the evalution and uses ofn this concepts. Ideas and thearieas with refrence to individual thinkers both the historically and analytically the different ideological stand points with regard to various concepts and thearies are to be critically explained with the pourpose of highlighting the difference in their perspectives and in order to understand their cotinuity and change furthermore their is need to emphasize the continuing relevance of dis concepta today and explain how an idea and theary of yesteryears gains prominence in contemprary political theary.

Special Paper I : Western Political Thought

This paper studies the clasical tradition inpolitical theary from Plato Marx with the view to understand how the great masters explain and analiys political events and problems of their time

and presciribed solutions the texts are to be inter preted voth in the political theorizing the limitations of the classical traddition. Namely it neglate of womens concerns and issues and the non-europian word are critically examind. The legasy of the thinkers is nexplaind with the view to establish the continuity and change within the western political traddition.

Special Paper II : Political Sociology

This course will introduce the overall scope of the sub-disipline of political sociology. The focus of the course will be on the political sociology of power. The emphasis is on the nature of power in modern societies more in the form of organizations and social formations than as indivisual power. Students are also expected to understand different forms of justifications of power and the role of ideology inn this regard. State will be studied as a repository of power in society while class and patriarchy are two instances of how the nature of power is shaped by social factors

TYBA

❖ English

Compulsory English

1) Learnt the use of language in literature
2) Became familiar with communicative competence
3) Improved communicative and soft skills

General Paper (G-3)

1) Became familiar with Indian English Poetry
2) Understood creative use of language
3) Developed knowledge of language and literature

Special Paper (S-3)

1) Became familiar with novel
2) Understood development of novel
3) Know the best novels

❖ मराठी

आधुनिक मराठी साहित्य आणि व्यावहारिक व उपयोजित मराठी :(G-3)

१. आधुनिक मराठी साहित्यातील विविध साहित्य प्रकारांचा परिचय वाढविणे व आकलन करून घेणे .

२. नेमलेल्या कलाकृतींच्या संदर्भात साहित्य परंपरेचा स्थूल परिचय करून देणे .

३. भाषेचे यथोचित आकलन करण्याची व वापर करण्याची यथायोजित क्षमता विकसित करणे .

४. निबंध व प्रवास वर्णन या साहित्य प्रकारचे तात्विक विवेचन करणे .

साहित्य विचार :(S-3)

१. साहित्याचे स्वरूप समजून घेणे .

२. साहित्याचे प्रयोजन समजून घेणे .

३. साहित्याची भाषा समजून घेणे.

४. साहित्याची आस्वाद प्रक्रिया समजून घेणे.

५. साहित्याची अभिरुची समजून घेणे.

६. साहित्य प्रकारची संकल्पना समजून घेणे.

भाषा विज्ञान :(S-4)

१. भाषेचे स्वरूप व कार्ये .भाषेच्या अभ्यासाचे महत्व समजून घेणे ,

२. भाषा म्हणजे काय व तिचे मानवी जीवनातील कार्ये जाणून घेणे .

३. स्वन निर्मितीची प्रक्रिया समजून घेणे .

४. मराठीची रुपिम व्यवस्था समजून घेणे .

५. ऐतिहासिक भाषा पद्धतींचे स्वरूप व महत्व लक्षात घेणे .

❖ हिन्दी

विशेष हिन्दी प्रश्नपत्र :3 - (Hindi – S3)

१. हिन्दी साहित्य के इतिहास की लेखन परंपरा से अवगत कराना |

२. हिन्दी साहित्य के इतिहास के कालखंडो के नामकरण एवं पृष्ठभूमी का परिचय देना |

३. हिन्दी साहित्य की प्रतिनिधी रचनाओ और रचनाकारो का महत्व विशद करना |

४. हिन्दी साहित्य के इतिहास के माध्यम से साहित्य और युगजीवन का संबंध विशद करना |

५. आधुनिक युग की सामाजिक,राजनीतिक , धार्मिकसाहित्तिक तथा आर्थिक परिस्थितीयो के बदलाव से ,

| छात्रो को अवगत करना

विशेष हिन्दी प्रश्नपत्र :4 (Hindi – S4)

१. छात्रो को काव्य साहित्य की परिभाषाओ द्वारा काव्य के स्वरूप | हेतू तथा काव्य प्रयोजनो का ज्ञान कराना ,

२. छात्रो को अलंकार | छंदो को स्वरूप से परिचित कराना ,

३. छात्रो को नाटक | निबंध के तत्वो की जानकारी देना ,

४. छात्रो को रस का स्वरूप | रस के अंगो एवं भेदो को परिचय देना ,

५. छात्रो को आलोचना का स्वरूप | आलोचना की उपयोगिता तथा आलोचना के गुणो से परिचित कराना ,

सामान्य हिन्दी प्रश्नपत्र :3 - (Hindi – G 3)

१. छात्रो को हिन्दी आत्मकथा | काव्यनाटक के विकास तथा उनके स्वरूप का परिचय देना ,

२. छात्रो को पारिभाषिक शब्द के माध्यम से कार्यालयीन हिन्दी से परिचित कराना ।

३. छात्रो को सरकारी पत्रलेखन की पद्धती से अवगत करना ।

४. छात्रो मे अंग्रेजी से हिन्दी मे अनुवाद करने की कला को विकसित करना ।

❖ History

General Paper 3 : History of the World in 20th Century (1914-1992)

It aims to help the student to know Modern World and acquaint the student with the Socio-economic & Political developments in other countries. This will motivate them to understand the contemporary world in the light of its background History and orient with political history of Modern World. It attempts to acquaint Students about the main developments in the Contemporary World to understand the important development in 20th century World. It Imparts knowledge about world concepts and enable students to understand the economic transition in World during the 20th Century. To become aware of the principles, forces, processes and problems of the recent times and to acquaint the students with growth of various political movements that shaped the modern world. This syllabus highlights the rise and growth of nationalism as a movement in different parts of the world.

❖ Economics

Economic Development & Planning

1. To learn Indian Economy
2. To Learn Planning
3. To create Economics Development Knowledge

Public Finance

1. To learn Indian Budget System
2. To study Tax & Income
3. To develop a Indian Finance Knowledge
4. To learn Politics Role in Economy

International Economics

1. To develop understanding the process of World Economy
2. To Understand India Role in World Economy
3. To Understand Global And Indian Economy

❖ Logics

Logic and Methodology of Science

1. The student is introduced to the methodology of science.
2. The scientific approach develops in the student.

3. Introduction to the natural sciences and social sciences.

❖ Philosophy

Aesthetics and Philosophy of Religion

1. The student develops a passion for art and beauty.
2. The student becomes familiar with the art.
3. Students due to Philosophy of religion seeks to think and solve Religious problems.

❖ Political Science

General paper-3 : Local Self Government in Maharashtra

1. To introduce the students to the structure of local self government of maharashtra
2. To make students aware of the various Local Self institutions, there functions,compositions and importance.
3. To identitiy the role of Local Government and Local Leadership in development.

Special paper-3 : Public Administration

This paper is an introductory course in Public Administration.The essence of public administration lies in its effectivness in transleting the governing philosophy in to programmes policies and activities and making it a part community level. The paper covers personnel public administration in its adminisreative salience and capabilities to deal with the porcess of change.The recent deveopment and particularly the emergence of new public administration are in corporated whinin the larger paradigm of democratic legitimacy. The importance of ligisiaticand judicial control over administration is alos highlighted.

Special paper-4 : International Politics

This paper deals with concepts of dimensions of international relations and make an analysis of different theories highlighting the major debates and differences within the different therotical paradigms, the dominant theories of power and the quetion of equity and justice, the different aspects of balance of power leading to the present situtation of unipolar world are included. It highlighths various aspects of conflict and conflict resolution, collective security and in the specificity of the long period of the post second world war phase of the cold war, of detente and Deterrence leading to theories of rough parityin armaments.

MA

MA Marathi

M.A. Part - I (प्रथम सत्र)

भाषा व्यवहार आणि भाषिक कौशल्य भाग – १ :(CC-1)

१. भाषिक जाणीव विकसित करणे .

२. भाषिक कौशल्यात्मक उपाययोजना सिद्ध करणे .

३. मुद्रित शोधनाची विद्यार्थ्यांमध्ये प्रावीण्याची निर्मिती करणे .

४. साहित्य प्रकाशन व्यवसाया संदर्भात जाणीव समृद्ध करणे .

अर्वाचीन मराठी वाडमयाचा इतिहास इ– १८१८ .स. १९२० :(CC-2)

१. वाडमयीन मूल्यांचे संस्कार करणे .

२. साहित्याचे नेमके आकलन करणे .

३. साहित्य निर्मितीच्या प्रेरणा लक्षात घेणे .

४. वाडमयीन इतिहासाच्या प्रेरणा समजून घेणे .

ऐतिहासिक भाषा विज्ञान :(CC-3)

१. भाषा अभ्यास पद्धतीतून साहित्याच्या अभ्यासाला परिपूर्णता आणून देण्याचा प्रयत्न करणे .

२. भाषिक अभ्यासाद्वारे साहित्याच्या अभ्यासाला परिपूर्णता आणून देण्याचा प्रयत्न करणे.

३. भाषा कुल संकल्पनेतून विद्यार्थ्यांना उपाययोजनेसाठी सिद्ध करणे .

ग्रामीण साहित्य :(CBOP-4)

१. स्वातंत्र्य प्राप्तीनंतरच्या कालखंडात ग्रामीण साहित्याच्या निर्मितीची कारण परंपरा समजून घेणे .

२. ग्रामीण साहित्याचे स्वरूप व कार्ये यांची चिकित्सा करणे .

३. ग्रामीण साहित्यातील विविध वाडमय प्रकारचा विकास कसा होत गेला याचे मूल्यमापन करणे .

४. ग्रामीण साहित्याने दिलेल्या योगदानाची मीमांसा करणे .

M.A. Part - I (द्वितीय सत्र)

भाषा व्यवहार आणि भाषिक कौशल्य भाग – २ :(CC-5)

१. भाषिक व्यवहाराबद्दल जाणीव विकसित करणे .

२. निवेदन कौशल्यात्मक उपाययोजना सिद्ध करणे .

३. दृक श्राव्य माध्यमांची विद्यार्थ्यांमध्ये जागृती निर्माण करणे .

अर्वाचीन मराठी वाडमयाचा इतिहास इ– १९२० .स. २०१० :(CC-6)

१. विशिष्ठ कालखंडातील साहित्य निर्मितीच्या प्रेरणा व प्रवृत्ती लक्षात घेऊन साहित्याचे आकलन करणे .

२. जीवन मूल्यांचे संस्कार करणे .

३. या कालखंडातील साहित्य कलाकृतींचे आकलन करणे .

समाज भाषा विज्ञान :(CC-7)

१. लेखकांच्या समग्र अभ्यासातून लेखकांच्या साहित्य कृतींचे मूल्यमापन करणे .

२. समाजांतर्गत निर्माण झालेल्या नव साहित्याचा स्थूल परिचय करून देणे .

३. साहित्य आणि संस्कृती यांचा परस्पर संबंध लक्षात घेऊन क्षमता व कौशल्य निर्माण करणे .

दलित साहित्य :(CBOP-8)

१. दलित साहित्यातून व्यक्त होणाऱ्या वेदनांचे व विद्रोहाचे स्वरूप समजून घेणे .

२. स्वातंत्र्य प्राप्तीनंतरच्या कालखंडात दलित साहित्याच्या निर्मितीची कारण परंपरा समजून घेणे .

३. दलित साहित्याने निर्माण केलेल्या विविध साहित्य प्रकारांचे मूल्यमापन करणे .

४. दलित साहित्याने दिलेल्या योगदानाची मीमांसा करणे .

M.A. Part- II (तृतीय सत्र)

प्रसार माध्यम आणि साहित्य व्यवहार :(P-09)

१. मुद्रित माध्यामांकरिता लेखन कौशल्य आत्मसात करणे .

२. दूरदर्शन माध्यमाचे समाजातील महत्व विशद करणे .

३. श्राव्य माध्यमांसाठी लेखन कौशल्य आत्मसात करणे .

साहित्य समिक्षा व संशोधन :(P-10)

१. साहित्य .समिक्षा व्यवहाराची समाज वाढीस लागणे ,

२. समीक्षेची संकल्पना समजून घेणे .

३. समिक्षा व्यवहारातील मुल्यामापनांचा परिचय करून घेणे .

४. मराठी साहित्य समीक्षकांची परंपरा समजून घेणे .

विशेष लेखकाचा अभ्यास :(P-11)

१. एकाच लेखकाचे वाडमयीन आकलन करून घेणे .

२. लेखकाचा काळ व चिंतन तत्वाचा मागोवा घेणे .

३. साहित्य निर्मितीचा क्रम लक्षात घेउन लेखकाच्या साहित्य कृतीचे वाडमयीन आकलन करणे .

लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य :(P-12)

१. लोकसाहित्याचे स्वरूप समजून घेणे.

२. लोकसाहित्याची संकल्पना समजून घेणे .

३. लोकसाहित्याचे अभ्यास क्षेत्र समजून घेणे .

४. लोकसाहित्य व ग्रांथिक साहित्य यातील साम्यभेद समजून घेणे .

M.A. Part - II (चतुर्थ सत्र)

प्रसार माध्यम आणि साहित्य व्यवहार :(P-13)

१. प्रसारमाध्यामांचे समाजातील महत्व विशद करणे .

२. प्रसारमाध्यामांकरिता लेखन कौशल्य आत्मसात करणे .

३. प्रसारमाध्यामांत सेवेची संधी मिळविण्यासाठी विद्यार्थ्यांची भाषिक क्षमता विकसित करणे .

साहित्य समिक्षा व संशोधन :(P-14)

१. संशोधनाची संकल्पना .प्रयोजने आणि विविध संशोधन पद्धती समजावून घेणे ,

२. वाडमयीन संशोधनाच्या विविध अभ्यास क्षेत्रांचा परिचय करून देणे .

३. आंतरविद्याक्षेत्रीय संशोधनाचे स्वरूप आणि महत्व लक्षात घेणे .

४. मराठी साहित्य संशोधनाची परंपरा समजावून घेणे .

विशेष लेखकाचा अभ्यास :(P-15)

१. लेखकाच्या व्यक्तिमत्वाची जडण घडणसांस्कृतिक व वाडमयीन निर्मिती समजावून घे ,णे .

२. विविध वाडमय कृतीतून लेखकाचे योगदान व त्याचे तौलनिक आकलन करणे .

३. एकाच लेखकाचे वाडमयीन आकलन करून घेणे .

४. लेखकाचा काळ व त्याची साहित्यनिर्मिती यातील सहसंवान्धाचा मागोवा घेणे .

५. साहित्य निर्मितीचा क्रम लक्षात घेउन लेखकाच्या साहित्य कृतीचे वाडमयीन आकलन करणे .

लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य :(P-16)

१. लोकसाहित्याचे स्वरूप समजून घेणे.

२. लोकसाहित्याची व्यापकता व सर्वसमावेशाकता लक्षात आणून देणे .

३. लोकसाहित्यातील विविध प्रकार समजून घेणे .

४. लोकसाहित्यातील सामाजिक .सांस्कृतिक जाणीव स्पष्ट करणे ,धार्मिक ,

MA Hindi

MA Part – I

मध्ययुगीन काव्य _

१. हिन्दी की मध्ययुगीन काव्य प्रवृत्तियो का परिचय देना |

२. मध्ययुगीन काव्य प्रवृत्तियो की पृष्टभूमि पर कवि विशेष की रचनाओ का परिचय कराना |

३. तत्कालीन काव्यभाषा की प्रवृत्तियो का परिचय देना |

४. पाठ्यकृतियो के आधार पर काव्य मूल्यांकन की क्षमता का विकास करना |

५. सर्जनात्मक कौशल विकसित करना |

कथा साहित्य _

१. उपन्यास विधा से अवगत कराना |

२. कहानी विधा से अवगत कराना |

३. पाठ्य रचनाओ मे अभिव्यक्त मूल्यो का संप्रेषण करना |

४. आलोचनात्मक दृष्टि का विकास करना |

५. सर्जनात्मक कौशल का विकास करना |

भारतीय काव्यशास्त्र _

१. भारतीय काव्यशास्त्र के विकासक्रम का परिचय देना |

२. भारतीय काव्यशास्त्र के प्रमुख संप्रदायो से अवगत कराना |

३. रचना वैशिष्ट्य और मूल्यबोध को पारखणे की क्षमता को विकसित करना |

४. आलोचानात्मक दृष्टी को विकसित करना |

नाटककार मोहन राकेश (वैकल्पिक)

१. नाटक के स्वरूप एवं संरचना से परिचय कराना |

२. नाटक के रचनाविधान और रंगमंच से परिचय कराना |

३. हिन्दी नाटक और रंगमंच के विकास का परिचय देना |

४. मोहन राकेश के नाटको के द्वारा नाट्यास्वादन और मूल्यांकन की दृष्टी विकसित करना |

५. नाट्याभिनय कौशल को विकसित करना |

कथेतर गद्य साहित्य_

१. व्यंग्य | रेखाचित्र और संस्मरण विधा से अवगत करना ,निबंध ,

२. पाठ्य विधाओ का भाषिक अध्ययन करवाना |

३. मौलिक लेखन कौशल विकसित करना |

शोध प्रविधि _

१. छात्रो को शोध प्रविधि से अवगत कराना |

२. शोध दृष्टी का विकास करना |

३. नये शोध – प्रवाहो से परिचय कराना |

४. शोध प्रक्रिया एवं शोधप्रबंध लेखन कौशल विकसित करना |

पाश्चात्य काव्यशास्त्र _

१. पाश्चात्य काव्यशास्त्र के विकासक्रम का परिचय देना |

२. पाश्चात्य चिंतको के चिंतन | सिद्धांत और प्रमुख आंदोलनो से अवगत करना ,

३. छात्रो को सृजन | आस्वादन एवं आलोचना दृष्टी देना ,

हिन्दी उपन्यास साहित्य (वैकल्पिक)

१. हिन्दी उपन्यास साहित्य के विकासक्रम एवं प्रवृतियो से परिचित कराना |

२. उपन्यासो के आस्वादन | अध्ययन की क्षमता विकसित करना ,

३. पाठ्य रचनाओ मे प्रस्तुत साहित्तिक मूल्यो का संप्रेषण करना |

४. मूल्यांकन की दृष्टी का विकास करना |

MA Part - II

सामान्य स्तर – आधुनिक काव्य – १ _ (महाकाव्य तथा खंडकाव्य)

१. छात्रो को आधुनिक हिन्दी काव्य की प्रवृत्तियो का परिचय कराना |

२. छात्रो को आधुनिक काल के प्रबंध और मुक्तक काव्य के तात्विक स्वरूप की जानकारी देना |

३. आधुनिक युग मे इन काव्य प्रकारो के विकासक्रम का परिचय देना |

४. छात्रो को आधुनिक काव्य प्रकारो के तात्विक स्वरूप एवं विकासक्रम के परिप्रेक्ष्य मे रचनाओ के आस्वादन , | अध्ययन और मूल्यांकन की दृष्टी देना

विशेष स्तर – भाषा विज्ञान _

१. भाषा विज्ञान के अंगो एवं विभिन्न शाखाओ का परिचय देना |

२. भाषा विज्ञान के सैद्धांतिक पक्ष से अवगत कराना |

३. भारतीय आर्य भाषाओ के ऐतिहासिक विकासक्रम की जानकारी देना |

४. हिन्दी के शब्द भंडार एवं व्याकरणिक स्वरूप से परिचित कराना |

५. हिन्दी के शब्द भेदो के विकासक्रम का विवरण देना |

६. हिन्दी के विविध रूपो की जानकारी देना |

७. साहित्य के अध्ययन मे भाषाविज्ञान की उपयोगिता स्पष्ट करना |

८. विकास के संदर्भ मे देवनागरी लिपि की विशेष जानकारी देना |

विशेष स्तर – हिन्दी साहित्य का इतिहास _

१. युगीन परिस्थितीयो और साहित्तिक प्रवृत्तियो के आधार पर हिन्दी साहित्य के इतिहास के काल विभाजन तथा नामकरण का परिचय देना |

२. आदिकालीनभक्तीकालीन त ,था रीतीकालीन प्रमुख साहित्तिक प्रवृत्तियोप्रतिनिधी कविओ और उनकी , | रचनाओ से परिचित कराना

३. जैन | नाथ और अपभ्रंश साहित्य के प्रभाव से अवगत कराना ,सिद्ध ,

४. युगीन सामाजिकसाहित्तिक तथा आर्थिक परिस्थितीयो के परिप्रेक्ष्य मे हिन्दी ,धार्मिक ,राजनीतिक , साहित्य से अवगत कराना |

विशेष स्तर – (वैकल्पिक) अनुवाद विज्ञान _

१. अनुवाद की परिभाषा | महत्व एवं व्याप्ति की जानकारी देना ,स्वरूप ,

२. अनुवाद के विविध रूप तथा अनुवाद प्रक्रिया का परिचय देना |

३. अनुवाद के सामाजिक | सांस्कृतिक पक्ष से अवगत कराना ,

४. अनुवाद के समय आनेवाली विभिन्न समस्याए तथा उनके समाधान से परिचित कराना |

५. अनुवाद की क्षमता विकसित कराना |

सामान्य स्तर – आधुनिक काव्य – २ क विशेष)वि कुँवर नारायण तथा नई कविता (

१. छात्रो को आधुनिक हिन्दी काव्य की प्रवृत्तियो का परिचय कराना |

२. छात्रो को आधुनिक काल के प्रबंध और मुक्त काव्य के तात्विक स्वरूप की जानकारी देना |

३. आधुनिक युग मे इन काव्य प्रकारो के विकासक्रम से परिचित कराना |

४. छात्रो को आधुनिक काव्य प्रकारो के तात्विक स्वरूप एवं विकासक्रम के परिप्रेक्ष्य मे रचनाओ के आस्वादन , अध्ययन औरमूल्यांकन की दृष्टी देना |

विशेष स्तर – हिन्दी भाषा का ऐतिहासिक विकास _

१. हिन्दी भाषा का उद्भव एवं विकास तथा ऐतिहासिक पृष्ठभूमी का परिचय देना |

२. भारतीय आर्य भाषाओ और उनके वर्गीकरण से अवगत कराना |

३. भारतीय आर्य भाषाओ के ऐतिहासिक विकास क्रम की जानकारी देना |

४. हिन्दी बोलियो का वर्गीकरण तथा क्षेत्र से परिचित कराना |

५. हिन्दी का व्याकरणिक स्वरूप और विकास की जानकारी देना |

६. लिपि विज्ञान की उपयोगिता स्पष्ट करना |

७. हिन्दी प्रचार एवं प्रसार के आंदोलन की जानकारी देना |

विशेष स्तर – हिन्दी साहित्य का इतिहास (आधुनिक काल)

१. हिन्दी गद्य के अविर्भाव के प्रधान कारणो | परिस्थितीयो का परिचय देना ,

२. विषयवस्तुप्रभाव ग्रहण आदी के परिप्रेक्ष्य मे प्रवृत्तियो को समझाते हुये ,विचारधारा ,शिल्प ,भाषाशैली , | हिन्दी की प्रमुख गद्य विधाओ के विकासक्रम से परिचित कराना तथा प्रमुख गद्यकारो का परिचय देना

३. आधुनिक हिन्दी कविता के विकास के प्रमुख चरणो की प्रवृत्तीयोउपलब्धियो तथा सीमाओ से अव ,गत कराना |

विशेष स्तर – (वैकल्पिक) ख लोकसाहित्य (

१. लोकसाहित्य के स्वरूप तथा उसके अध्ययन के महत्व से परिचित कराना |

२. लोकसाहित्य की विविध विधाओ की जानकारी देना तथा लोकजीवन मे उसकी व्यापकता समझाना |

३. लोकसाहित्य का महत्व समझाकर उसके विशेष अध्ययन के लिए प्रेरित करना |

४. महाराष्ट्र के लोकसाहित्य से परिचित कराना |

MA Politics

MA Part - I

Semester-I

PO-C1: Traditions of Political Thought

This Course is meant to serve as a window on the major traditions of thought that have shaped Political discourse in different parts of the world over the last three millennia. It stresses the great diversity of social contexts and philosophical vision that have informed the ideas of key Political Thinker across epochs. The chief objective is to project the history of political thought as a series of critical, interconnected and open-ended conversation about the ends and means of the good life.

PO-C2: Administrative Theory

Public Administration is an essential part of society. In last few years the profession of Public Administration is going through changes Present paper aims to make aware the students about Evolution & importance of the public Administration paper introduces changing trends in the field of Public Administration.

Po-C3: Political Institutions in India

The course introduces the students to the leading institutions of India's political system and to the changing nature of these institutions. Apart from explaining the stricture and functions of the main institutions the course will try to acquaint students with the idea of institutional balance of power as discussed in the Indian constitution and as developed during the functioning of India democracy over the past seven decades.

PO-O1-Modern Political Ideologies

This Course is meant to acquaint students with the character and trajectory of modern political ideologies. It seeks to clarify the key differences between ideological and other modes of thought, and to introduce debates such as End of ideology and end of History. More specifically, the course serves as an introduction to the distinctive doctrines and variants of major ideologies, and to the role the latter play in contemporary politics.

Semester-II

PO-C4: Comparative Political Analysis

The purpose of this course is to acquaint the student with the sub-discipline of comparative politics. It accepts the students to understand the comparative methodology and dynamics of domestic politics across countries.

PO-C5: Theory of International Politics

Students need a brief history of international politics to understand why we study the subject and how current scholarship is informed by what preceded it. Theories provide interpretative frameworks for understanding what is happening in the world and the levels of analysis. Competing theories are presented.

PO- C6: Public Policy

The purpose of this course is to provide students an understanding of the basic concept, theories and process of public policy. The course also seeks to help students understand public policy processes and actors involved in it by studying specific polices. It attempts to help students understand and analyze policy making in practical context.

PO-O5-Politics and the Media

The news media are sometimes called the fourth branch of government and for good reason. Much of our exposure to politics comes not from direct experience but from mediated stories. This course is designed to help you think about this relationship between the news media and politics. We will explore how news organization decide what is news, how they report it, how those reports have an impact on viewers or readers and ultimately, the political system.

This course covers theories and methods used for understanding the role of media in political processes. It explores the role of mediated communications by political actors, media organizations, and individuals via both traditional digital media, the development of public opinion, the images and perception of public figures and policies in elections.

The course is particularly relevant to students interested in further study in politics and media and considering careers related to journalism, public relations, opinion polling, campaign management, political advertising, and consulting.

The course is intended to advanced students understanding of the role of media and communication in political processes including theories and methods used for analyzing the effects of media and communication on public opinion the practice and processes of political communication, factors influencing news production and dissemination, as well as the roles played by media in various domestic and international policy prosesses.Finally,the students should be equipped to critically evaluate the role of media and communication in relation to politics and society in the wide range of different settings globally.

MA Part - II

Semester-III

PO-C7: Political Thinking in Modern India (4 Credit)

The course introduces the students to the key ideas of political thinking in modern India as it shaped in the colonial context. The course is woven around ideas/issues and not around individual

thinkers. Students will be encouraged to understand and decipher the diverse and often contesting ways in which ideas of nationalism, democracy and social transformation were discussed by leading Indian thinkers.

PO-C8: Political Sociology

This course will introduce the overall scope of the sub-discipline of political sociology. The focus of the Scours will be on the political sociology of power. The emphasis is on the nature of power in modern societies –more in the form of organizations and social formations than as individual powers. Students are also expected to understand different forms of justifications of power and the role of ideology in this regards. State will be studied as a repository of power in society while class and patriarchy are two instances of how the nature of power is shaped by social factors.

PO-C9: Theory of International Relations

This course introduces the students to the evolution and important theories. Students need a brief history of international politics to understand why we study the subject and how current scholarship is informed by what preceded it. Theories provide interpretative frameworks for understanding what is happening in the world and the levels of the analysis. Competing theories are presented.

PO-O10: Indian Administration

The purpose of this course is to provide students with broad understanding of key dimensions of Indian Administration functioning at different levels. The objective of the course is to help students to understand and analyze the administrative reforms introduced recently to make administration people centric and to what extent that goal has been realized

Semester-IV

PO-C10: Traditions of Political Thought

This course is meant to serve as a window on the major traditions of thought that have shaped political discourse in different parts of the world over the last three millennia. It stresses the great diversity of social context and philosophical vision that have informed the ideas of key political thinkers across epochs. The chief objective is to project the history of political thought as a series of critical, interconnected and open ended conversations about the ends and means of the good life.

PO – C11: Political Process in India

The course will introduce to the student the key issues and details of the political process in post independence India. It will also try to develop among students a perspective to understand and analyze Indian politics. The aim is to help students understand the expansive meaning of

political process as it shapes in the arena of electoral and party politics, in the form of mass mobilizations and as politics of interests.

PO-C12: Political Participation

This course is a continuation of the study of power. Political action is seen as integrally related to search for justifications of power. Political socialization is the process that shapes the durable set of attitudes and beliefs which affect nature and extent of participation. Public opinion also shapes political activity. The course expects that students will go beyond the study of routine participation and understand the relevance of collective action in the form of social movements and/or collective violence.

PO-O14: Party System in India

The course introduces students to the nature of party system in India and to the function of main political parties operating in the system. The course will also acquaint students with analytical perspectives on party politics in India.

MA/MSc Geography

MA/Msc Part - I

Semester –I

GGUT-111: Principles of Geomorphology

1. The learner will be Understand the interior part of earth.
2. The learner will be acquired the knowledge about the land features.
3. The learner will be acquired the knowledge about the Geomorphic processes of river, Glacial, wind, sea waves etc.

GGUT -112: Principles of Climatology

1. Learn the interaction between the atmosphere and the earth's surface.
2. Understand the importance of the atmospheric pressure and winds.
3. Understand how atmospheric moisture works.
4. Develop an idea about cyclones.

GGUT-113 :Principles of Economic Geography

1. The learner will be acquired knowledge about economic activates of human being.
2. The learner will be acquired knowledge about stages of economic development of region
3. The learner will be able a case study of agro-based industry.

GGUT -112: Principles of Population and Settlement geography

1. Build an idea about urban and rural settlements, and its relationship with environment and also different theories related to settlement geography.
2. Know about classification and morphology of settlements.
3. Understand the trends and patterns of world urbanization.
4. Know about different theories of urban growth.

Practical courses:

GGUP -115: Practical in Physical and Human geography

1. The learner will be able to analysis drainage area.
2. The learner will be able to Draw Climatic elements diagrams.
3. The learner will be acquired the knowledge about the Agriculture regionalization with the help of crop combination methods.
4. The learner will be able to Measurement of network structure.
5. The learner will be able to analysis of population and settlement data and to show with the help of various maps and graph.

MA/MSc Part-II

Semester-III

Gg-301: Geography Of India With Spl. Ref. to Maharashtra.

1. The learner will be acquired the knowledge about the Location, Geological structure of India and Maharashtra.
2. The learner will be Understand the Physiography, Drainage, Climate, soil, Forest of India and Maharashtra.
3. The learner will be acquired the knowledge about the distribution of mineral, power recourses, major crops, industries, population of India and Maharashtra.
4. The learner will be Understand the Development of India and Maharashtra.

Gg-303: Research methods in Geography.

1. The learner will be acquired the basic knowledge about the Research methods.
2. The learner will be known about the use of toposheets, aerial photographs, satellite images in research.
3. The learner will be Understand the to collect geographical data by field work and analysis the data with the help statistical methods and how to prepare the report.

Gg: 306 : Geoinformatics –III

1. The learner will be acquired knowledge about Spatial Analysis
2. The learner will be acquired knowledge about Digital Image Processing

Gg-312: Trade and Transport geography.

1. The learner will be acquired the basic knowledge about the Modes of transportation and measurement of network structure.
2. The learner will be acquired the knowledge about the Trade, international trade.
3. The learner will be Understand the significance of transportations and trade in the economy.

Gg- 321: Political Geography

1. The learner will be acquired knowledge about History and development of political geography.
2. The learner will be Understand the concept of Nation and State.
3. The learner will be acquired the knowledge about the Geopolitical Significance of Indian Ocean.
4. The learner will be acquired the knowledge about the Political Geography of India.

Practical courses:

Gg-302: Interpretation of topographical maps and village survey / project report.

1. The learner will be acquired the basic knowledge about the SOI and OS toposheet.
2. The learner will be able to interpret the physical and cultural features with the help of toposheets.
3. The learner will be acquired the knowledge about the socio –economic survey. And how to prepare the report.

Gg: 307 Title: Practicals in Geoinformatics

1. The learner will be acquired knowledge about Statistics, Projections and Survey.
2. The learner will be acquired knowledge about stages of economic development of region
3. The learner will be able to interpretation of Aerial Photography and Satellite Images.
4. The learner will be acquired the skill of Software based Image Processing in GIS

Gg: 332: Practicals in Economic Geography

1. The learner will be acquired knowledge about Techniques in Agricultural Geography.
2. The learner will be acquired knowledge about Techniques in Industrial Geography.

The learner will be acquired knowledge about Techniques in Transport Geography.

B.COM.

F.Y.B.COM.

Semester: I

COM-112 : Financial Accounting- I

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.
3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-113 : Business Economics (Micro) – I

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping

tomorrow's leaders, managers, and professionals.

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4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-114 : Computer Concepts and Application – I

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

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4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-115 : Organizational Skills Development- I

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to

service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-115 : BANKING & FINANCE- I(Fundamentals of Banking I)

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

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5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-116 : Business Environment & Entrepreneurship – I

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.
3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

Semester-II

COM-122 : Financial Accounting- II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals
3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The

curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-123 : Business Economics (Micro) – II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-124 Computer Concepts & Applications - II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

COM-125 : Organizational Skill Development- II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become moreimperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be more dynamic toincorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level

5) The choice based credit system offers a cafeteria approach where the students have the liberty tochoose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

Com-125 (B) : FUNDAMENTALS OF BANKING – II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become moreimperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3) The existing education system of imparting commerce education needs to be more dynamic toincorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5) The choice based credit system offers a cafeteria approach where the students have the liberty tochoose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

COM-126(E) : Business Environment & Entrepreneurship - II

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different fromother disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2) To meet the growing needs of the business society, there is greater demand for sound development ocommerce education. The relevance of commerce education has become more imperative, this means a mark change in the way commerce and management education is perceived in India. The Commerce education isdedicated to developing tomorrow's leaders, managers, and professionals.
3) The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to berestructured accordingly.
4) The learning inputs are required to be more update, skill based and with appropriate

applications. Thiswill be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he/she can score more than the required credits.

S.Y.B.COM.

201 : Business Communication.

1) Commerce education is that area of education, which develops the required knowledge, skills andattitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation

2) To meet the growing needs of the business society, there is greater demand for sound developmentof commerce education. The relevance of commerce education has become more imperative, this means amarked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to berestructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications.This will be achieved through the introduction of Choice based Credit System at undergraduate level.The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses wherehe she can score more than the required credits.

202 : Corporate Accounting

1) Commerce education is that area of education, which develops the required knowledge, skills andattitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound developmentof commerce education. The relevance of commerce education has become more imperative, this means amarked change in the way commerce and management

education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to berestructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications.This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses wherehe she can score more than the required credits.

203 : Business Economics (Macro)

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2) To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated todeveloping tomorrow's leaders, managers, and professionals.

3) The existing education system of imparting commerce education needs to be moredynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students toopt for additional courses where he /she can score more than the required credits.

204 : Business Management

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods

and processes.

2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

205 : Elements of Company Law.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

206-A : Business Administration Special Paper I

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management and entrepreneurship
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

206-E : Cost and Works Accounting Special Paper I

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.

6) To develop communication and analytical skills among students.

206-G : Business Entrepreneurship Special Paper I

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

T.Y.B.COM.

301: Business Regulatory Framework (Mercantile Law)

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

302: Advanced Accounting

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

303(B) : International Economics

1) Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of trade, commerce and industry. Commerce educationist entirely different from other disciplines. Hence it must charter course routes to service the aspiration of the nation.
2) To meet the growing need of the business society, there is greater demands for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The commerce education is dedicated to developing tomorrows leaders, managers and professionals.
3) The exciting education system of imparting commerce education needs to be more dynamics to incorporate all local and global change in the field of trade and commerce. The curriculum needs to be restructured accordingaly.
4) The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of choice based credit system at undergraduate level.
5) The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows student to opt for additional courses where he/she can score more than the required credits.

304: Auditing & Taxation

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

304–A : Business Administration Special Paper II

1) To equip and train Post Graduate students to accept the challenges of business world by providing opportunities for study and analysis of advanced commercial and businessmethods and processes.

2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management and entrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

305-E : Cost and Works Accounting Special Paper II

1) To equip and train Post Graduate students to accept the challenges of business world by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

305-G : Business Entrepreneurship Special Paper II

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

306-A : Business Administration Special Paper III

1) To equip and train Post Graduate students to accept the challenges of business world by providing opportunities for study and analysis of advanced commercial and businessmethods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management and entrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

306-E : Cost and Works Accounting Special Paper III

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

306-G : Business Entrepreneurship Special Paper III

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

M.COM.

M.COM. I

SEMESTER I

101: Management Accounting

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.

6) To develop communication and analytical skills among students.

102 : Strategic Management

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.

103 : Advanced Accounting & Taxation Special Paper I

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

104 : Advanced Accounting & Taxation Special Paper II

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

113 : Business Administration Special Paper I

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.

4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

114 : Business Administration Special Paper II

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

SEMESTER II

201- Financial Analysis & ControlCompulsory

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

202-A : Industrial Economics Compulsory

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.

6) To develop communication and analytical skills among students.

203 : Specialized Areas in Accounting

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

204 : Business Tax assessment and planning

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

213 : Business Ethics & Professional Values

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

214 : Elements of Knowledge Management

1) To equip and train Post Graduate students to accept the challenges of businessworld by

providing opportunities for study and analysis of advanced commercialand business methods and processes.

2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

M.COM. II

SEMESTER III

301 : Business Finance

1) To equip and train Post Graduate students to accept the challenges of Business World by providing opportunities for study and analysis of advanced Commercial and business methodsand processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students for seeking suitable careers in management and entrepreneurship.
4) To study by students methods of Data collection and their interpretations.
5) To develop among students Communication, Study and Analytical skills.

302 : Research Methodology for Business.

1) To equip and train Post Graduate students to accept the challenges of Business World by providing opportunities for study and analysis of advanced Commercial and business methodsand processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students for seeking suitable careers in management and entrepreneurship.
4) To study by students methods of Data collection and their interpretations.
5) To develop among students Communication, Study and Analytical skills.

303: Advanced Auditing.

1) To equip and train Post Graduate students to accept the challenges of Business World by providing opportunities for study and analysis of advanced Commercial and business methodsand processes.

2) To develop independent logical thinking and facilitate personality development.
3) To equip the students for seeking suitable careers in management and entrepreneurship.
4) To study by students methods of Data collection and their interpretations.
5) To develop among students Communication, Study and Analytical skills.

303 : Specialized Areas in Auditing.

1) To equip and train Post Graduate students to accept the challenges of Business World by providing opportunities for study and analysis of advanced Commercial and business methodsand processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students for seeking suitable careers in management and entrepreneurship.
4) To study by students methods of Data collection and their interpretations.
5) To develop among students Communication, Study and Analytical skills.

313: Human Resource Management

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

314: Organizational Behaviour

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

SEMESTER IV

401: Capital Market and Financial Services

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

402: Industrial Economic Environment

1) To develop independent logical thinking and facilitate personality development.
2) To equip the students to seek suitable careers in management and entrepreneurship.
3) To acquaint students with significance of research in business
4) To impart skills regarding methods of data collection and their interpretations.
5) To develop communication and analytical skills among students.

403 : Recent Advances in Accounting, Taxation & Auditing

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

404 : Project Work / Case Studies

1) To equip and train Post Graduate students to accept the challenges of Business World by providing opportunities for study and analysis of advanced Commercial and business methodsand processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students for seeking suitable careers in management and entrepreneurship.

4) To study by students methods of Data collection and their interpretations.
5) To develop among students Communication, Study and Analytical skills.

413 : Recent Advances in Business Administration

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

413 : Project Work / Case Studies.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

SEMESTER IV

401 : Capital Market and Financial Services.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

402 : Industrial Economic Environment.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

403 : Recent Advances in Accounting, Taxation & Auditing.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management and entrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

404 : Project Work / Case Studies.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

413 : Recent Advances in Business Administration

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercial and business methods and processes.

2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.
6) To develop communication and analytical skills among students.

414 : Project Work / Case Studies.

1) To equip and train Post Graduate students to accept the challenges of businessworld by providing opportunities for study and analysis of advanced commercialand business methods and processes.
2) To develop independent logical thinking and facilitate personality development.
3) To equip the students to seek suitable careers in management andentrepreneurship.
4) To acquaint students with significance of research in business.
5) To impart skills regarding methods of data collection and their interpretations.

B.B.A.

F.Y.B.B.A.

101: Principles of Management

1) To understand basic concept regarding org. Business Administration
2) To examining how various management principles
3) To develop managerial skills among the students

102. Business Communication

1) To understand what is the role of communication in personal and business world
2) To understand system and communication and their utility
3) To develop proficiency in how to write business letters required in business

103. Business Accounting

1) To develop right understanding role and importance of monetary & financial transactions in business
2) To cultivate right approach towards classifications of different transactions and their implications
3) To develop proficiency preparation of basic financial as to how to write basis accounting statement - Trading and P&L

104. Business Economics-Micro

1) To understand role of economics as it influences society and business
2) To study how different decisions are taken in relation to price demand and supply
3) To develop right understanding regarding Monopoly, perfect competition, revenue Etc.

105. Business Mathematics

1) To develop appropriate understanding as how to use mathematic like computation interest, profit etc.
2) To cultivate right understanding regaining numerical aptitude
3) To develop logical approach towards analytical approach data

106. Business Demography

1) To give proper understanding regarding concept of demography in modern economic setup
2) To study how population and structure changes affecting quality of life and business
3) To develop clarity of concept regarding social economic process & urbanization and its impact on society

201. Business Organizations and Systems

1) To understand role and functions of modern business
2) To develop right understanding regarding business environment
3) To study how a business institution functions in a given economic set up

202. Principles of Marketing

1) To develop write understanding regarding marketing environment in the country
2) To develop appropriate conceptual understanding as to develop basic marketing concept
3) To develop new understanding regarding services, rural marketing and new trends in marketing

203. Principles of Finance

1) To cultivate right approach towards money, finance, and their role in business
2) To develop right understanding regarding various sources of finance & their role & utility in business
3) To develop basic skills as to concept of capital structure and concept of capital structure

204. Basics of Cost Accounting

1) To develop rational understanding regarding concept of cost expenditure in business
2) To develop understanding how overheads influence the cost structure of cost
3) To develop skills for computation of total cost for a particular product

205. Business Statistics

1) To understand role and importance of statistics in various business situations
2) To develop skills related with basic statistical technique
3) Develop right understanding regarding regression, correlation and data interpretation

206. Fundamentals of Computers

1) To develop concept of information and their role in modern businesses
2) To develop rational approach as to how computers can be used in data process analysis in business
3) To develop understanding regarding cautions to be taken security, safety and security while using net based service

S.Y.B.B.A.

301:Personality Development

1) To make the students aware about the dimensions and importance of effective personality.
2) To understand personality traits and formation and vital contribution in the world of business.
3) To make the students aware about the various dynamics of personality development.

302: Business Ethics

1) To impart knowledge of Business Ethics to the students.
2) To promote Ethical Practices in the Business.
3) To develop Ethical and Value Based thought process among the future manager's entrepreneurs.

303: Human Resource Management and Organizational Behavior

1) To introduce to the students the functional department of human resource management and acquaint them with planning, its different functions in an organization.

2) To introduce the human resource processes that are concerned with planning, motivating and developing suitable employees for the benefit of the organization.

304: Management Accounting

1) To impart basic knowledge of Management Accounting.
2) To know the implications of various financial ratios in decision making.
3) To study the significance of working capital in business.
4) To understand the concept of budgetary control and its application in business.
5) To develop the calculating ability of various techniques of management accounting.

305: Business Economics (Macro)

1) To study the behavior of working of the economy as a whole.
2) To develop an analytical framework to understand the inter-linkages among the crucial macro economic variables.
3) To apply economic reasoning to problems of business and public policy.

306: IT in Management

1) To understand the role of IT in Management.
2) To understand the basics of operating systems.
3) To know the current happenings.

401: Production & Operations Management

1) To provide goods and services at the right time, at the right place at the right manufacturing cost of the right quality.
2) To understand manufacturing technology and its role in developing business strategy.
3) To identify the role of operation function.
4) To understand the external and internal effects of five operation performance objectives

402: Industrial Relations and Labour Law

1) To impart the students with the knowledge about complexities between labour and management relationships.
2) To make the students aware about mechanisms of Industrial Dispute and friendly interventions to deal with employee-employer problems.
3) To impart the students with the knowledge of laws & how law affects the industry & labour.

403: Business Taxation

1) To understand the basic concepts and definitions under the Income Tax Act, 1961.
2) To update the students with latest development in the subject of taxation.
3) To Acquire knowledge about Computation of Income under different heads of Income of Income Tax Act, 1961.
4) To acquire knowledge about the submission of Income Tax Return, Advance Tax, Tax deducted at Source, Tax Collection Authorities.
5) To prepare students Competent enough to take up to employment in Tax planner.
6) To develop ability to calculate taxable income of firms, co-operative societies and charitable trust.

404:International Business

1) To acquaint the students with emerging issues in international business.
2) To study the impact of international business environment on foreign market operations.
3) To understand the importance of foreign trade for Indian economy.

405: Management Information System

1) To understand the concepts of Information System
2) To study the concepts of system analysis and design
3) To understand the issues in MIS

406: Business Exposure

1) To develop the understanding of the student with a realistic and practical perception of the industry its layout, procedures, processes, organization structure
2) The objective of the Industrial Visit is to help students gain firsthand information regarding the functioning of the Industry which presents the students with opportunities to plan, organize and engage in active learning experiences both inside and outside the classroom

T.Y.B.B.A.

501: Supply Chain and Logistics Management

1) To introduce the fundamental concepts in Materials and Logistics Management
2) To familiarize with the issues in core functions in materials and logistics management

502: Entrepreneurship Development

1) To create entrepreneurial awareness among the students.
2) To help students to up bring out their own business plan.
3) To develop knowledge and understanding in creating and managing new venture.

503: Business Law

1) To understand basic legal terms and concepts used in law pertaining to business
2) To comprehend applicability of legal principles to situations in Business world by referring to few decided leading cases.

504: Research Methodology

1) To provide the students with basic understanding of research process and tools for the same.
2) To provide an understanding of the tools and techniques necessary for research and report writing.

505 - A: Analysis of Financial Statements

1) This course is designed to prepare students for interpretation and analysis of financial statements effectively
2) To make the student well acquainted with current financial practices
3) This course is designed primarily for students who expect to be intensive users of financial statements as part of their professional responsibilities.

505 -B: Sales Management

1) To provide the students with basic understanding of the processes and skills necessary to be successful in personal selling and insights about recent trends in sales management
2) To provide an understanding of the tools and techniques necessary to effectively manage the sales function - organization - sales individual.
3) To provide students with advanced skills in the areas of interpersonal communications, Motivational techniques

506 – A: Long Term Finance

1) To make the study of long-term financing
2) To make the student well-acquainted regarding current financial structure

507 – B: Retail Management

1) To provide insights into all functional areas of retailing.
2) To give a perspective of the Indian retail scenario.
3) To identify the paradigm shifts in retailing business with increasing scope of technology and e-business.

601: Business Planning and Project Management

1) To acquaint the students with the planning process in business and familiarize them with the function and techniques of project management

602: Event Management

1) To acquaint the students with concepts, issues and various aspects of event management

603: Management Control System

1) To introduce to the students the function of management control, its nature, functional areas, and techniques.

604: E- Commerce

1) To know the concept of electronic commerce
2) To know the concept of Cyber Law & Cyber Jurisprudence
3) To know Internet marketing techniques

605: Financial Services

1) To study in detail various financial services in India
2) To make the students well acquainted regarding financial markets

606: Advertising and Sales Promotion

1) To develop knowledge and understanding of importance and functions of advertising
2) To understand Key features of Sales Promotion

B.B.A.(Computer Application)

FYBBA (CA)

101: Business Communication Skills

1) To understand what is the role of communication in personal and business world
2) To understand system and communication and their utility
3) To develop proficiency in how to write business letters and other communications in required in business.

102: Principles of Management

1) To understand basic concept regarding org. Business Administration
2) To examining how various management principles
3) To develop managerial skills among the students

103: C-Programming

1) To introduce the foundations of computing, programming and problem- solving using computers.
2) To develop the ability to analyze a problem and devise an algorithm to solve it.
3) To formulate algorithms, pseudocodes and flowcharts for arithmetic and logical problems.
4) To understand structured programming approach.
5) To develop the basic concepts and terminology of programming in general.
6) To implement algorithms in the ‘C’ language.
7) To test, debug and execute programs.

104: Database Management Systems

1) To understand the fundamental concepts of database.
2) To understand user requirements and frame it in data model.
3) To understand creations, manipulation and querying of data in databases.

105: Business Statistics

1) To understand role and importance of statistics in various business situations
2) To develop skills related with basic statistical technique

3) Develop right understanding regarding regression, correlation and data interpretation

106:Lab Course –I

1) To understand the program development life cycle.
2) Solve simple computational problems using modular design and basic features of the 'C' language.
3) Understand basic database management operations.
4) Design E-R Model for given requirements and convert the same into database tables.

SYBBA (CA)

201: Organizational Behavior & Human Resource Management

1) To understand basic concept of HRM & OB.
2) To make aware students about traditional & modern methods of procurement & development in organization.
3) To know the major trends in HRM & OB.

202: Financial Accounting

1) To develop right understanding regarding role and importance of monetary and financial transactions in business.
2) To cultivate right approach towards classifications of different transactions and their implications.
3) To develop proficiency preparation of basic financial as to how to write basis accounting statement - Trading and P&L.

203: Business Mathematics

1) To understand role and importance of Mathematics in various business situations and while developing software's.
2) To develop skills related with basic mathematical technique

204: Relational Data Base

1) Enables students to understand relational database concepts and transaction management concepts in database system.

2) Enables student to write PL/SQL programs that use: procedure, function, package, cursor and trigger.

205: Web Technology (HTML-JSS-CSS)

1) To know & understand concepts of internet programming.
2) To understand how to develop web based applications using JavaScript.

206:Lab Course –II

1) Solve simple computational problems using modular design and basic features of the 'HTML' language.
2) Understand basic relational database management operations.

301: RDBMS (Relational Database Management System)

1) Enables students to understand relational database concepts and transaction management concepts in database system.
2) Enables student to write PL/SQL programs that use: procedure, function, package, cursor and trigger.

302: Data Structure Using C

1) To understand different methods of organising large amounts of data.
2) To efficiently implement different data structure.
3) To efficiently implement solution for different problems.
4) To get more knowledge on C programming language.

303: Introduction to Operating System

1) To know system programming.
2) To know services provided by operating system.
3) To know the Scheduling concepts.

304: Business Mathematics

1) To understand role and importance of Mathematics in various business situations and while developing software's.
2) To develop skills related with basic mathematical technique

305: Software Engineering

1) This course enables students to understand system concepts and its application in Software development.

306: Lab Course –III

1) Design and implement Data structures and related algorithms.
2) Understand several ways of solving the same problem.

TYBBA (CA)

401: Object Oriented Programming Using C++

1) Acquire an understanding of basic object-oriented concepts and the issues involved ineffective class design.
2) Enables student to write C++ programs that use: object-oriented concepts such as information hiding, constructors,destructors, inheritance.

402: Programming in Visual Basic

1) To learn properties and events, methods of controls and how to handle events of different controls.
2) To understand the use of active controls and how to design VB application.
3) To learn connectivity between VB and databases.

403: Computer Networking

1) To know about computer network.
2) To understand different topologies used in networking
3) To learn different types of network.
4) To understanding the use of connecting device used in network.

404: Enterprise Resource Planning and Management

1) To know what is ERP.
2) To learn different ERP technologies.

405: Human Resource Management

1) To acquaint the students with the Human Resource Management its different functions in an organization and the Human Resource Processes that are concerned with planning, motivating and developing suitable employees for the benefit of the organization.

406: Lab Course –IV

1) Understanding the steps of system analysis and design.
2) Understanding Data requirements for a specific problem domain.
3) Designing Data base as per the Data requirements.
4) Designing queries as per the functional requirements

501: Java Programming

1) To learn the basic concept of Java Programming.
2) To understand how to use programming in day to day applications.

502: Web Technologies

1) To know & understand concepts of internet programming.
2) To understand how to develop web based applications using PHP.

503: Dot Net Programming

1) This will introduce visual programming and event driven programming practically.
2) This will enhance applications development skill of the student.

504: Object Oriented Software Engineering

1) To Understand concept of system design using UML.
2) To understand system development through object oriented techniques.

505: Project Work

1) Understanding importance of Object Orientation in Software engineering.
2) Understand the components of Unified Modeling Language.
3) Understand techniques and diagrams related to structural modeling.
4) Understand techniques and diagrams related to behavioral modeling.
5) Understand techniques of Object Oriented analysis, design and testing.

506: Lab Course –V

1) Develop practical knowledge and Use the Java programming language for various programming technologies.
2) Develop software in the Java programming language, (application)
3) To develop understanding the process of designing and implementing Core Java programs.

601 : Advanced Web Technologies

1) To know & understand concepts of internet programming.
2) To understand the concepts of XML and AJAX.

602 : Advanced Java

1) To know the concept of Java Programming.
2) To understand how to use programming in day to day applications.
3) To develop programming logic.

603 : Recent Trends in IT

1) To introduce upcoming trends in Information technology.
2) To study Eco friendly software development.

604 : Software Testing

1) To know the concept of software testing.
2) To understand how to test bugs in software.
3) To develop programming logic.

605: Project Work

1) Understanding importance of Object Orientation in Software engineering.
2) Understand the components of Unified Modeling Language.
3) Understand techniques and diagrams related to structural modeling.
4) Understand techniques and diagrams related to behavioral modeling.
5) Understand techniques of Object Oriented analysis, design and testing.

606 : Lab Course -VI

1) Develop practical knowledge and use the Java programming language for various programming technologies.
2) Develop software in the Java programming language.
3) To develop understanding the process of designing and implementing Advance Java programs.
4) Implement Client and Server end Java programs

B.Sc.

FYBSC

Mathematics

MT-111 : Algebra

1) To study the concepts of Sets, Relations and Functions
2) To discuss the divisibility in integers and their properties
3) To understand the concept of complex numbers and how the number system has been developed.

MT-112 : Calculus I

1) To understand the algebraic structure of real numbers, its absolute values.
2) To understand sequences, subsequences and their properties.
3) To understand concept of limit, right and left hand limits.
4) To understand the concept of continuity at a point and continuity of functions on an intervals.

MT – 113 : Mathematics Practical

1) Use appropriate mathematical concepts and skills to solve the problems.
2) Select and apply general rules correctly to solve problems those includes in algebra and calculus.
3) To develop skills of solving problems using Maxima software.
4) To improve mathematical problem solving techniques.

MT-121 : Analytical Geometry

1) To understand the analytical geometry in two and three dimensions.
2) To understand how to identify the nature and geometrical concepts of conics.
3) To explain the concept of planes and lines in three dimensions.

4) To understand sphere and their tangent planes both for standard and general sphere.

MT-122 : Calculus II

1) To understand the concept of differentiation
2) To discuss various mean value theorems such as Rolle's theorem, Lagrange's mean value theorem and Cauchy's mean value theorem
3) To understand L' Hospital rule and using this rule how to find limits of indeterminate forms.
4) To understand the concept of ordinary differential equation and the methods for obtaining their general solutions.
5) To see the concept of Exact differential equations and also integrating factors.

MT-123 : Mathematics Practical

1) Use appropriate mathematical concepts and skills to solve the problems.
2) Select and apply general rules correctly to solve problems those includes in algebra and calculus.
3) To develop skills of solving problems using Maxima software.
4) To improve mathematical problem solving techniques.

Chemistry

F. Y. B. Sc. Chemistry

Term- I

Course: 1) Physical & Inorganic Chemistry:

The learner will be acquired with sound knowledge of -

1) Behavior of gases, ideal gas as a model system and its extension to real gases. The dependence of physical state on pressure, volume and temperature is being realized.
2) The existence of liquid state, comparison of its properties with other states is to be perceived. Liquid crystal are essentials in all common and research devices and instruments hence they are introduced briefly.
3) To solve problems regarding van der Waal's and Critical constant and regarding P-V-T relations.
4) Theoretical basis of adsorption phenomena is integrated. Understanding dynamic nature of

surface and its applications in catalysis and in dispersed phases will lead to new area of nano science.

5) Mathematical background required for derivations, depictions and problem solving. This chapter strengthens these aspects.

6) Normality, Molarity, Normal solution, Molar solution, equivalent weight, ppm, %w/v, %v/v & related problems.

7) Understand the concept of oxidation & reduction, oxidizing agent, reducing agent, redox reaction, oxidation number, Balance the equation by ion electron method & oxidation number method

8) Calculation of Equivalent weight of oxidant & reductant.

Course: 2) Organic & Inorganic Chemistry:

The learner will be acquired with sound knowledge of -

1) The fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.

2) Drawing of organic molecules and arrow pushing concept.

3) Acid-base theories, pKa / pKb values for common organic acids and bases and factors Affecting strength of acids and bases.

4) Structural effects and their applications in determining strength of acids and bases.

5) The common and IUPAC names of alkanes, alkenes, alkynes and homocyclic, polycyclic Aromatic hydrocarbons.

6) Methods of preparation and chemical reactions of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.

7) Application of Huckel's rule to different organic compounds to find out aromatic /non Aromatic characters.

8) Skeleton of long form of periodic table, Quantum numbers, Shells, sub-shells, types of orbital and their shapes, Afbau, Pauli's exclusion principle and Hund's rule, Block, group, periodic law and periodicity, Name, symbol, electronic configuration, trends and properties, Crown ether and cryptans, Separation of s-block elements with crown ethers.

9) Compounds of s-block elements: oxides, hydroxides, peroxides and superoxides.

10) Application of s-block elements: Industrial, biological and agricultural field.

Term- II

Course: 1) Physical & Inorganic Chemistry:

The learner will be acquired with sound knowledge of –

1) Atom being most important micro particle in construction of matter, modern developments of its structure is presented. The quantization of energy and duality of matter in this context is elaborated . Schrodinger equation is the basis of quantum chemistry that has been introduced for simplest system hydrogen atom.
2) Natural changes are understood with the help of second and third laws of thermodynamics. These laws are presented with the help of state function entropy. Entropy changes in various processes and under various conditions have been discussed
3) Basic principle of overlapping of atomic orbital with specific shapes and sizes
4) Fundamental concepts of theories of overlapping of atomic orbitals.
5) Concept of hybridization and differentiation with overlap.
6) Application of non-bonded lone pairs in shape of molecule
7) Basic understanding of geometry and effect of lone pairs with examples
8) Concept of different types valence shell electron pairs and their contribution in bonding

Course: 2) Organic & Inorganic Chemistry:

The learner will be acquired with sound knowledge of–

1) The fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.
2) Drawing of organic molecules and arrow pushing concept.
3) Acid-base theories, pKa / pKb values for common organic acids and bases and factors affecting strength of acids and bases.
4) Structural effects and their applications in determining strength of acids and bases.
5) The common and IUPAC names of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.
6) Methods of preparation and chemical reactions of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.
7) Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters.
8) Structure, nomenclature, preparation and reactions of organic compounds.
9) The characteristic reactions of each functional group which can be used to identify and

distinguish that compound from other compounds.

10) Predict the conversion of one functional group into other functional group involving one or more number of steps.

11) Conversion of the given compound into other compound containing more or less number of carbon atoms.

12) Prediction of possible products when reactants are given. In case there are more than one possible products, identify the major and minor products.

13) Suggest the possible reagents to bring about the given conversion.

Term- I & II

Course: 3) Chemistry Practical:

The learner will be acquired with sound knowledge of -

1) Preparation of solutions like normal & molar.
2) Handling of viscometer & eudiometer.
3) Volumetric analysis, hardness of water.
4) Inorganic & Organic qualitative analysis.
5) Organic techniques like- Thin layer chromatography, Crystallization, Distillation, Sublimation.
6) Organic preparation with purification & TLC techniques.

Botany

BO-111 Plant Life and Utilization –I

1) Understand the diversity among Algae, Lichens, Fungi, and Bryophytes
2) General Outline of plant kingdom
3) Lower Cryptogam, Algae, Fungi, & Lichene.
4) Higher Cryptogam, Bryophyte and Pteridophyte.
5) Distinguishing character of these group

BO-112 Plant Morphology and Anatomy

1) Understand the habit of the angiosperm plant body.
2) Know the vegetative characteristics of the plant.
3) Learn about the reproductive characteristics of the plant.
4) Understand the scope & importance of Anatomy
5) Know various tissue systems
6) Perform the techniques in anatomy
7) Understand the normal and anomalous secondary growth in plants and their causes

BOT. 113: Practical Course Based on BO111 & BO 112

1) Study of diversity of Bryophytes and Pteridophytes w.r.t systematic position and morphology.
2) Study of life cycle of *Riccia,* Spirogyra, Agaricus.
3) Morphology of root and stem with its modification.
4) Morphology of Leaf and its modification.
5) Study of Flower morphology , Inflorescence andits types of Inflorescence.
6) Study fruit Morphology and types.
7) Study of internal primary structure of Dicot & Monocot.

[SEMESTER-II]

BO-121 Plant Life and Utilization –II

1) Understand the morphological diversity of Pteridophytes, Gymnosperm, and Angiosperm.
2) Understand the economic importance.
3) Know the vegetative characteristics of the plant
4) Learn about the reproductive characteristics of the plant.
5) Understand Gymnosperms, distinguishing characters, economic importance and classification.

BO-122 Principle of Plant Science [Physiology &Cell Biology]

1) Know importance and scope of plant physiology.
2) To understand the plants and plant cells in relation to water.
3) Understand the process of Diffusion, Osmosis, Plasmolysis, Plant growth& growth regulators.
4) Understand the Structure, types of plant cell, cellwall, plasma membrane& cell cycle in plants.
5) Understand the Molecular biology ,Structure& types of DNA, DNA replication.

BOT. 123: Practical Course Based on BO121 & BO 122

1) Study of Life Cycle of Nephrolepis, Cycas
2) Study of utilization and economic importance of Pteridophytes and Gymnosperms.
3) Study of comparative account of Dicotyledonous and Monocotyledonous plants
4) Study of utilization and economic importance of Angiosperms- food, fodder, fibers, horticulture and Medicines.
5) Study of mitosis, Meosis.
6) Estimation of chlorophyll-a and chlorophyll-b
7) Plasmolysis- endosmosis, exosmosis Demonstration of Osmosis

Zoology

Semester I

ZO-111-Animal Diversity I

1) The students will be able to understand classify and identify the diversity of animals.
2) The students know his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.

ZO-112-Animal Ecology

1) The working in nature to save environment will help development of leadership skills to promote betterment of environment.
2) The learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand to local life cycle and problems of the community.

ZO-113-Zoology Practical Paper

1) To understand anticipate, analyze and evaluate natural resource issues and act on a life style that conserve nature.
2) Study of classification of invertebrates able to understand the possible group of the invertebrates observed in nature to understand our role as a care taker and promoter of life.

Semester II

ZO-121- Animal Diversity II

1) The students understand the importance of classification of animals and classify them effectively using the six levels of classification.

ZO-122- Cell Biology

1) The learner will understand the importance of cell as a structural and functional unit of life.
2) The cellular mechanism and its functioning depend on endomembrane and structures. They are best studied with microscopy.

ZO-123-Zoology Practical Paper

1) Study of entire cell structure with the help of microscope.
2) Economic importance of animals.
3) Study of classification and identification of animals.

Physics

PHY-111 : Mechanics and Properties of Matter

1) To understand the laws of motion and their problems
2) To understand different type of energy.
3) To understand fluid mechanics and their applications
4) To understand properties of matter.

PHY-112 : Physics Principles and Applications

1) To understand the general structure of atom, spectrum of hydrogen atom.
2) To understand the atomic excitation and LASER principles.
3) To understand the bonding mechanism and its different types.
4) To demonstrate an understanding of electromagnetic waves and its spectrum.
5) Understand the types and sources of electromagnetic waves and applications.
6) To demonstrate quantitative problem solving skills in all the topics covered

PHY-121 Heat and Thermodynamics

1) To understand thermodynamics laws.
2) To understand second law of thermodynamics and entropy.
3) To understand principle and working of heat engines and refrigerator and thermometry.

PHY-121 : Electricity and Magnetism

1) To understand the concept of the electric force, electric field and electric potential for stationary charges.
2) Able to calculate electrostatic field and potential of charge distributions using Coulomb's law and Gauss's law.
3) To understand the dielectric phenomenon and effect of electric field on dielectric.
4) To study magnetic materials and its properties.
5) Demonstrate quantitative problem solving skills in all the topics covered

PHY-113 : Physics Laboratory 1A and PHY-123 : Physics Laboratory 1B Laboratory courses

1) Correlation between theory and practical to improve the understanding.

2) To learn solar cell efficiency, Basic experiments in electrostatics, heat and other related theory.
3) To development of practical skills and use innovative ideas in experiments.

SYBSC

Mathematics

MT - 211: Multivariable Calculus I

1) Understand the concept of limit, continuity for the functions of two and three variables.
2) Understand the concept of partial differentiation.
3) Understand the concept of differentiability and equality of mixed partial derivatives of second order .
4) Understand the concept of directional derivative
5) Understand maxima and for functions of two and three variables.
6) To understand the concept of double and triple integrals.

MT - 212: Laplace Transforms and Fourier series

1) To understand the concept of Laplace transforms
2) Understand the various properties of Laplace transforms.
3) Understand the concept of Inverse Laplace transforms.
4) Understand the concept of Gamma function and some standard functions.
5) Understand the various properties of of Inverse Laplace transforms.
6) Understand the concept of Convolution theorem
7) Understand concept of Fourier series and its expansion.

MT – 213 : Mathematics Practical

1) Use appropriate mathematical concepts and skills to solve the problems.
2) Select and apply general rules correctly to solve problems those includes in algebra and calculus.
3) To develop skills of solving problems using Maxima software.
4) To improve mathematical problem solving techniques.

MT - 221: Linear Algebra

1) Understand the concept of vector space or linear space.

2) Understand the concept of vector subspace
3) Understand what is mean by linearly dependent and independent variables.
4) Understand the concept of basis and dimension of a vector space.
5) Understand the concept of linear transformation, rank and nullity. \Understand the concept of inner product space.
6) To discuss Cauchy- Schwartz inequality
7) To understand Gram - Schmidt process to find ortho normal basis.

MT – 222 : Numerical methods and their applications

1) To see how round – off number to appropriate significant figures and also decimal points.
2) To see how to find solutions algebraic and transcendental equations.
3) Discuss least square methods to fit a polynomial to the given data.
4) To see the concept of interpolation and different difference operators.
5) To study numerical differentiation and integration.
6) To understand applications of numerical methods.

MT – 223 : Mathematics Practical

1) Use appropriate mathematical concepts and skills to solve the problems.
2) Select and apply general rules correctly to solve problems those includes in algebra and calculus.
3) To develop skills of solving problems using Maxima software.
4) To improve mathematical problem solving techniques.

Chemistry

Semester-III

CH-301 : Physical and Analytical Chemistry

After the completion of this course students will be to

1) Understand concept of kinetics, terms used, and rate laws, molecularity and order.
2) Understand factors affecting rate of reaction, integrated rate laws, characteristics, expression for half-life and examples of zero order, first order, and second order reactions.
3) Understand order of reaction by integrated rate equation method, graphical method, half-life method and differential method.

4) Understand temperature coefficient and effect of temperature on rate constant
5) Understand derivation of Arrhenius equation and evaluation of energy of activation graphically.
6) Understand collision theory and transition state theory of bimolecular reaction and comparison.
7) Understand adsorption, classification of given processes into physical and chemical adsorption.
8) Understand classification of Adsorption Isotherms, explanation of adsorption results in the light of Langmuir adsorption isotherm, Freundlich's adsorption Isotherm and BET theory.
9) Understand how to apply adsorption process to real life problem?
10) Understand how to explain and compare meaning of accuracy and precision?
11) Understand different terms related to errors in quantitative analysis.
12) Understand how to apply statistical methods to express his / her analytical results in laboratory?
13) Understand different terms in volumetric analysis such as units of concentration, indicator, equivalence point, end point, standard solutions, primary and secondary standards, complexing agent, precipitating agent, oxidizing agent, reducing agent, redox indicators, acid base indicators, metallochome indicators, etc.
14) Understand how to perform calculations involved in volumetric analysis?
15) Understand the explanation of acid-base titrations, complexometric titration / precipitation titration / redox titration.
16) Understand how to apply volumetric methods of analysis to real problem in analytical chemistry / industry?
17) Understand how to solve / discuss problems using theory.

CH-302 : Inorganic and Organic Chemistry

On successful completion of this course the students will be able to

1) Understand terms related to molecular orbital theory (AO, MO, sigma bond, pi bond, bond order, magnetic property of molecules, etc).
2) Understand how to apply LCAO principle for the formation of MO's from AO's.?
3) Understand formation of different types of MO's from AO's, formation of different types of MO's from AO's.
4) Understand how to draw and explain MO energy level diagrams for homo and hetero diatomic molecules?

5) Understand how to apply MOT to explain bonding in diatomic molecules other than explained in syllabus?
6) Understand different terms related to the coordination chemistry (double salt, coordination compounds, coordinate bond, ligand, central metal ion, complex ion,coordination number, magnetic moment, crystal field stabilization energy, types of ligand, chelate effect, etc.)
7) Understand Werner's theory of coordination compounds,differentiate between primary and secondary valency, correlate coordination number and structure of complex ion.
8) Understand how to identify and draw the structures aromatic hydrocarbons from their names or from structure name can be assigned?
9) Understand how to explain / discuss synthesis of aromatic hydrocarbons, the mechanism of reactions involved, important reactions of aromatic hydrocarbon, correlate reagent and reactions?
10) Understand how to identify and draw the structures alkyl / aryl halides from their names or from structure name can be assigned?
11) Understand synthesis of alkyl / aryl halides, the mechanism of Nucleophilic Substitution (SN1, SN2 and SNi) reactions, important reactions of alkyl / aryl halides
12) Understand difference between alcohols and phenols, synthesis of alcohols / phenols.

CH-303 : Chemistry Practical - III

After the completion of this practical course students will be to

1) Understand theoretical principles experimentally.
2) Understand how to interpret the experimental data on the basis of theoretical principles.
3) Understand/verify theoretical principles by experiment observations, explain practical output/data with the help of theory.
4) Understand systematic methods of identification of substance by chemical methods.
5) Write balanced equation for the chemical reactions performed in the laboratory.
6) Perform organic and inorganic synthesis and is able to follow the progress of the chemical reaction by suitable method (colour change, ppt. formation, TLC).
7) Understand set up of the apparatus ,preparation the solutions properly for the designed experiments.
8) Understand how to perform the quantitative chemical analysis of substances explain principles behind it.
9) Understand systematic working skill in laboratory will be imparted in student.

Semester-IV

CH-401 : Physical and Analytical Chemistry

On successful completion of this course the students will be able to

1) Understand the terms in phase equilibria such as- system, phase in system, components in system, degree of freedom, one / two component system, phase rule, etc.
2) Understand types of equilibrium such as true or static, metastable and unstable equilibrium.
3) Understand meaning of phase, component and degree of freedom, phase rule
4) Understand terms, laws, difference between ideal and no-ideal solutions, Raoult's law.
5) Understand azeotropes, Lever rule, Henrys law and its application.
6) Understand upper **c**ritical. Solution temperature, lower critical solution temperature and having both UCST and LCST.
7) Understand distribution law and its thermodynamic proof
8) Understand different terms in Colorimetry such as radiant power, transmittance, absorbance, molar, Lamberts Law, Beer's Law, molar absorptivity
9) Understand different terms in column chromatography such as stationary phase, mobile phase, elution, adsorption, ion exchange resin, adsorbate, etc.
10) Understand the properties of adsorbents, ion exchange resins, , separation of ionic substances using resins, separation of substances using silica gel / alumina.
11) Understand applications of column chromatographic process for real analysis in analytical laboratory.
12) Understand how to solve problem by applying theory?

CH-402 : Inorganic and Organic Chemistry

On successful completion of this course the students will be able to

1) Understand isomerism in coordination complexes, different types of isomerism in coordination complexes.
2) Understand principles of VBT to explain bonding in coordination compound of different geometries, inner and outer orbital complexes, limitation of VBT.
3) Understand principle of CFT, different type of complexes (Td, Oh, Sq. Pl complexes)
4) Understand strong field and weak field ligand approach in Oh complexes, magnetic properties of coordination compounds on the basis of weak and strong ligand field ligand concept, origin of colour of coordination complex.
5) Understand spectrochemical series, tetragonal distortion / Jahn-Teller effect in Cu (II) Oh complexes only.

6) Understand how to identify and draw the structures aldehydes, ketones, amines and carboxylic acids from their names or from structure name can be assigned?
7) Understand synthesis and mechanism reactions of aldehydes, ketones, amines and carboxylic acid
8) Understand important reactions of aldehydes, ketones, amines and carboxylic acids and their derivatives.
9) Understand conversion of functional groups.
10) Understand the structures of different conformations of cyclohexane.
11) Understand as axial hydrogen, equatorial hydrogen, confirmation, substituted cyclohexane, etc.
12) Understand stability with respect to potential energy of different conformations of cyclohexane.

CH-403 : Chemistry Practical - IV

After the completion of this practical course students will be to

1) Understand theoretical principles experimentally
2) Understand to interpret the experimental data on the basis of theoretical principles.
3) Understand / verify theoretical principles by experiment or explain practical output with the help of theory.
4) Understand systematic methods of identification of substance by chemical methods.
5) Understand to balanced equation for all the chemical reactions performed in the laboratory.
6) Understand how to perform organic and inorganic synthesis and able to follow the progress of the chemical reaction
7) Understand how to set up the apparatus properly for the designed experiments?
8) Understand quantitative chemical analysis of substances and able to explain principles behind it.

Botany

Semester – III

BO 231 Taxonomy of Angiosperms and Plant Ecology

After the completion of this course students will be able to

1) Be familiar with fundamental aspects of Angiosperms and Plan Ecology
2) To Understand Plants Nomenclature and Identification

3) To know importance of Taxonomy and Ecology of plants
4) To realize scope and importance of Plant Identification
5) Be aware of Ecosystems and diversity of plants

BO 232 Plant Physiology

After the completion of this course students will be able to

1) Know Fundamentals of Plant Physiology
2) Understand Physiological processes performed by plants
3) Study Physiological Parameters: Seed Dormancy, Seed Germination
4) Be familiar about Applied aspects of Photoperiodism and Vernalization
5) Understand Commercial Aspects of Bio-fertilizers : Blue Green Algae

BO 233 Practical based on BO 231 & BO 232

After the completion of this course students will be able to

1) Make use of Tools of Taxonomy, to know working and application of certain Ecological Instruments
2) Imbibe Study Of Plant families along with description of Flowering Plants and study Biodiversity of Plants through Botanical Excursion.
3) Perform Vegetation Study of plants
4) Acquire knowledge of methods related to isolation of Proteins
5) Get training of various Physiological techniques
6) Develop interest in Botany by participating in the field visits: Floriculture industry, Soil testing center and Seed Testing Centers arranged by Department of Botany.

Semester – IV

BO 241 Plant Anatomy and Embryology

After the completion of this course students will be able to

1) Be familiar with scope and importance of Plant Anatomy and Embryology
2) Understand fundamentals of Plant Embryology by using microscopic techniques.
3) Imbibe Developmental aspects of Plant Anatomy and Embryology
4) Go through commercial aspects of Plant Anatomy
5) Study Embryo of Dicotyledonous and Monocotyledonous of Plants

BO 242 Plant Biotechnology

After the completion of this course students will be able to

1) Know Fundamentals of Biotechnology
2) Understand Advances of Biotechnology
3) Imbibe Study various techniques of Plant Genetic Engineering
4) Study Applied aspects of Plant Biotechnology
5) Understand Commercial Aspects Plant Biotechnology, Biofuel Use and Bioremediation

BO 243 Practical's based on BO 241 & BO 242

After the completion of this course students will be able to

1) Do Dissection of plants parts
2) Perform Embryological study
3) Cultivate *Spirulina* as Single Cell Protein
4) Understand GEL electrophoresis
5) Perform Plant Tissue culture Method for building own Business

Zoology

Semester-III & Semester-IV

ZO - 231 Animal Diversity III and ZO - 241 Animal Diversity IV

1) The students will be able to understand, classify and identify the diversity of higher vertebrates.
2) The students will able to understand the complexity of higher vertebrates
3) The students will be able to understand different life functions of higher vertebrates.
4) The students will be able to understand the linkage among different groups of higher vertebrates.
5) The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life

ZO - 232 Applied Zoology I & ZO - 242 Applied Zoology II

1) The learner understands the basics about beekeeping tools, equipment, and managing beehives.
2) The learner understands the basic information about fishery, cultural and harvesting methods

of fishes and fish preservation techniques.

3) The learner understands the biology, varieties of silkworms and the basic techniques of silk production.
4) The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.

ZO - 233 Zoology Practical Paper and ZO - 243 Zoology Practical Paper

1) The learner understands the basics about beekeeping tools, equipment, and managing beehives
2) The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life

Physics

PH211: Mathematical Methods in Physics

1) Understand the complex algebra useful in physics courses.
2) Understand the concept of partial differentiation.
3) Understand the role of partial differential equations in physics.
4) Understand vector algebra useful in mathematics and physics.
5) Understand the singular points of differential equation.To understand the laws of motion and their problems.

PH212: Electronics

1) Apply laws of electrical circuits to different circuits.
2) Understand the relations in electricity.
3) Understand the properties and working of transistors.
4) Understand the functions of operational amplifiers.
5) Design circuits using transistors and operational amplifiers.
6) Understand the Boolean algebra and logic circuits.

PH221: Oscillations, Waves and Sound

1) Understand the physics and mathematics of oscillations.
2) Solve the equations of motion for simple harmonic, damped, and forced oscillators.
3) Formulate these equations and understand their physical content in a variety of applications.
4) Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.

5) Explain oscillation in terms of energy exchange, giving various examples.
6) Solve problems relating to undamped, damped and force oscillators and superposition of oscillations.
7) Understand the mathematical description of travelling and standing waves.
8) Recognise the one-dimensional classical wave equation and solutions to it.
9) Calculate the phase velocity of a travelling wave.
10) Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer.
11) Define the decibel scale qualitatively, and give examples of sounds at various levels.
12) Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments

PH222: Optics

1) Acquire the basic concepts of wave optics.
2) To describe how light can constructively and destructively interfere.
3) Explain why a light beam spreads out after passing through an aperture.
4) Summarize the polarization characteristics of electromagnetic waves.
5) Appreciate the operation of many modern optical devices that utilize wave optics.
6) Understand optical phenomena such as polarisation, birefringence, interference and diffraction in terms of the wave model.
7) Analyse simple examples of interference and diffraction phenomena.
8) Be familiar with a range of equipment used in modern optics.

PH223: Practical Course

1) After completing this practical course students will be able to Use various instruments and equipment.
2) Design experiments to test a hypothesis and/or determine the value of an unknown quantity.
3) Investigate the theoretical background to an experiment.
4) Set up experimental equipment to implement an experimental approach.
5) Analyse data, plot appropriate graphs and reach conclusions from your data analysis.
6) Work in a group to plan, implement and report on a project/experiment.
7) Keep a well-maintained and instructive laboratory logbook

TYBSC

Chemistry

Course: 1) Physical Chemistry (CH-331) :

The learner will be acquired with sound knowledge of -

1) Expression of the rate constant k for third order reaction, examples of third order reaction, characteristics of third order rate constant k, derivation for half-life period of third order Reaction and to show that half-life is inversely proportional to square of initial concentration of reactants, experimental determination of order of reaction by Integrated rate equation method, graphicalmethod, Half-life method and Differential method, term energy of activation with the help of energy diagram, term temperature coefficient, effect of temperature on rate constant k, derivation of Arrhenius equation, graphical evaluation of energy of activation.

2) Ohm's law and electrical units such as coulomb, Ampere, Ohm and Volt, meaning of specific resistance, specific conductance, cell constant and their units, cell constant, its theoretical and experimental determination, preparation of conductivity water, experimental determination of conductance, variation of specific and equivalent conductance of strong and weak electrolyte with, dilution, meaning of infinitely dilute solution, Kohlrausch's law of independent migration of ions and its applications such equivalent conductance of weak electrolyte at zero conc., degree of dissociation (α),ionic product of water, transport number of an ion, Hittorf's rule, experimental determination of transport number by Hittorf's and moving boundary method, drawbacks of Arrhenius theory, Debye-Huckel-Onsager Interionic Attraction theory, Asymmetry /Relaxation effect, electrophoretic effect, validity of Onsager equation, fugacity and activity concept, activity and activity coefficient of strong electrolyte, solve the numerical problems based on this topic.

3) Additive and constitutive properties, term specific volume, molar volume and molar refraction, meaning of electrical polarization of molecule, meaning of induced and orientation polarization, dipole moment and its experimental determination by temperature variation method, application of dipole moment for structure determination, nature of wave and its characteristic such as wavelength, wave number, frequency and velocity, Rotational /Microwave spectroscopy, derivation for rotational spectra for the transition from J to J+1,limitations of Rotational Spectra, vibrational Spectra, vibrational rotational spectra, Raman Spectroscopy.

4) Meaning and Types of equilibrium such as true or static, metastable and Unstable

Equilibrium, meaning of phase, component and degree of freedom, derivation of phase rule, explanation of water system, description of the curve, Phase rule relationship and typical features, explanation of sulphur system : Description of the curve, Phase rule relationship and typical features, explanation of two component system curve : for silver-lead and Zinc-cadmium.

Course: 2) Inorganic Chemistry (CH-332):

The learner will be acquired with sound knowledge of –

1) The theories of covalent bond formation, assumptions and limitations of VBT, need of concept of MOT, LCAO principal and its approximation, formation of bonding and antibonding MO's, shapes of s, p, d orbital, combinations of s-s, s-p, p-p and d-d orbital to form σ and π molecular orbitals, comparison of a) Atomic orbital and molecular orbital
2) BMO and ABMO c) Sigma and pi MO's d) VBT and MOT e) Comparison between BMO, ABMO and NBMO, MO energy level diagrams for homonuclear diatomic molecules having interactions between 2s and 2p orbitalsand having no interactions between 2s and 2p orbitals : H2, H2+,He2+, Li2, Be2, B2, C2, N2, O2, O2+, O2-, O22-, F2, Ne2, shapes of molecular orbitals, bond order, energy and explanation on stability of the above molecule and ions, MO energy level diagrams for heteronuclear diatomic molecules:CO, NO, HCl, HF and calculations of bond order, energy and explain the stability of the molecules.
3) Coordination chemistry, different types of Ligands, chelating agents, chelate and stability of chelates and complexes, charge on complex ion and the oxidation number, the IUPAC name the co-ordination compound, application of co- ordination compounds in biology and chemistry.
4) Be able to draw the geometrical and optical isomerism of complexes, Choose the correct geometry for complexes with C.N. 4 and C.N. 6 with the help of Stereoisomerism, types of isomerism, stereoisomerism in complexes with C.N. 4 and C. N. 6, EAN rule and calculate EAN value of the complexes, Comment on EAN value and stability of complexes, merits and The demerits of Sidgwick's theory, concept of hybridization, VB representation of tetrahedral, square planar, trigonal bipyramidal and octahedral complexes.

Course: 3) Organic Chemistry (CH-333):

The learner will be acquired with sound knowledge of –

1) Definition and types of organic acid and base, The pka and pkb concepts, Effect of temperature on pka/pkb, Comparison between strengths of acids/bases, acid-base catalysis
2) Draw different types of disubstituted cyclohexane in Chair form, distinguish between geometrical and optical isomerism, Stability, energy calculations with potential energy diagram and optical activity of these conformers.
3) Nucleophiles and leaving groups, Different types of nucleophilic substitution reactions, Inversion and racemization, kinetics, mechanism & stereochemistry of these reactions, SN1 or SN2 reactions, SNi mechanism in presence and absence of pyridine, To predict product/s or supply thereagent/s for these reactions.
4) Different types of carbon-carbon unsaturated compounds, Orientation / rules in addition Reactions, structure of carbonyl group, Reactivity concept, Correct mechanism of addition reactions using different reagents, Types of some known addition reactions,
5) Elimination reactions, Different types of bases and leaving groups, Hoffmann and Saytzeff rule, E1 & E2 reactions.
6) Aromatic substitution reactions, Classification of directing groups, arenium ion and Ipso Substitution

Course: 4) Analytical Chemistry (CH-334):

The learner will be acquired with sound knowledge of –

1) Principles of common ion effect and solubility product, Formation of complex ion, Factors affecting on solubility of precipitation, Phenomenon of super saturation and precipitation formation, Meaning of co-precipitation and post precipitation, Choice of liquid for washing the precipitate, Precautions during filtration, drying and ignition of precipitate.
2) Methods of thermo gravimetric analysis, Principles of TGA and DTA, Types of TGA, Relation between TGA and DTA, Thermal equation of TGA, Different factors affecting TGA curve, Determination of calcium oxalate precursor, Applications of TGA, DTA and DSC.
3) Principles of Spectrophotometric analysis and properties of electromagnetic radiation Different Terms like absorbance, transmittance, and molar absorptivity, Mathematical Statement and derivation of Lambert's Law and Beer's Law, Different wavelength selectors and their importance , Instrumentation and working of single and double beam spectrophotometer, Additivity Principle, Different methods of color comparators.

4) Voltammetry and polarography as an analytical tool, construction, working, advantages and disadvantages of DME, different terms involved in Ilkovic equation, determination of Zn and Cd from the mixture, Significance of the different terms involved, Need of removal of dissolved oxygen from analyte solution.

5) Atomic absorption spectroscopy as an analytical tool, Measurement of absorbance of atoms by AAS, Interferences in atomic absorption spectroscopy, Applications and numerical problems

6) Emission spectroscopy as an analytical tool, Measurement of emission of atomic species, Different methods of analysis, Application and numerical problems.

Course: 5) Industrial Chemistry (CH-335):

The learner will be acquired with sound knowledge of –

1) Importance of chemical industry, Meaning of the terms involved, Comparison between batch And continuous process, Knowledge of various industrial aspects.

2) Various insecticides, Pesticides,. Fungicides, Rodenticides &biopesticides used in agriculture field with their synthesis and applications.

3) Concept of basic chemicals, their uses and manufacturing process, They should also know the physic chemicals principals involved in manufacturing process.

4) Introduction, occurrence, composition of petroleum, resources, processing of petroleum, other Properties, Fuels and eco-friendly fuels, use of solar energy etc.

5) Scope, Nutritive aspects of food constituents, Quality factors and their measurements, Food deterioration factors and their control ,Food preservation and Food additives.

6) Chemistry of starch, Manufacturing of industrial starch and its applications, Characteristics of some , food starches, Non-starch polysaccharides-cellulose-occurrence.

7) Learn importance of these industries, Manufacture of cement by modern methods, Definition of setting and hardening, Reinforced concrete.

Course: 6) Nuclear Chemistry (CH-336A):

The learner will be acquired with sound knowledge of –

1) The atom, elementary particles,sub-nucleons and the quarks, Classification of nuclides, isotopes, isobars, isotones and isomers, Nuclear stability on the basis of even-odd nature of Z and N, N/Z ratio, The binding energy, The nucleus, its size and shape, mechanical effects

due to orbiting and spinning ofnucleons, Magnetic quantum numbers, principal and radial quantum number.

2) The Shell model, Magic number, Salient features of shell model, Nuclear configuration, The liquid drop model, Semi-empirical mass equation.
3) Types of radioactive decay, decay kinetics and their general characteristics, Alpha decay, Beta decay and gamma decay, Nuclear isomerism, isomeric transitions, internal conversion, Auger effect.
4) Bethe's notation, Different types of Nuclear reactions, Conservation in nuclear reaction,
5) Excitation energy of compound nucleus

T. Y. B. Sc. Chemistry

Course: 1) Physical Chemistry (CH-341) :

The learner will be acquired with sound knowledge of –

1) Electrochemical cell, Origin of EMF of electrochemical cell, Conventions used to represent electrochemical cell, Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell, reference electrode, Primary and secondary reference electrode Construction, representation, working and limitation of Standard hydrogen Electrode Construction, representation and working of Calomel and Silver –Silver Chloride Electrode, types of electrodes.

2) Atom its nucleus and outer sphere, Classification of nuclides with suitable examples such as isotope, isobar, isotone and isomers, Explanation of stability of nucleus through neutron to proton ratio, odd and even nature of proton and neutron, Mean binding energy, Conversion of mass into energy, Mass defect, Total and mean binding energy, Explanation of binding energycurve, Types of decayDiscovery of radioactivity, Decay kinetics, Relation of half-life with decay constant

3) Distinguish between crystalline and amorphous solids / anisotropic and isotropic solid, Crystallography and laws of crystallography, Weiss and Millers Indices, Crystal system and their characteristics, Polymorphism /allotrophism, Distance between the planes for 100, 110 and 111 type of simple, body centered and face Centered cubic crystals, Bragg's experiment

4) Concept of quantization, Atomic spectra, Wave particle duality, Uncertainty principle and its Physical significance, Derivation of time independent Schrodinger wave equation, Wave Function and its Interpretation, Well behaved function, Hamiltonian Operator, Particle in a box (1 and 3 dimensional), Degeneracy.

Course: 2) Inorganic Chemistry (CH-342) :

The learner will be acquired with sound knowledge of –

1) The term f-block elements, Inner transition elements, lanthanides, actinides, electronic configuration of lanthanides and actinides, Oxidation states of lanthanides and actinides and Common oxidation states, Separation lanthanides by modern methods, Lanthanide Contraction and effects of lanthanide contraction on post-lanthanides, Use of lanthanide elements in different industries, Transuranic elements, Preparation methods of transuranic Elements, Nuclear fuels and their applications.
2) The meaning of metal & semiconductor, The difference between metal, semiconductor and insulator. Metallic bond on the basis of band theory, The energy band and energy curve, Draw (E) & N (E) curves, Explain the electrical conductivity of metals with respect to valence electrons. Explain the effect of temperature and impurity on conductivity of metals and semiconductors. Intrinsic and extrinsic semiconductor. The term valance band and conduction band, n and p type of semiconductors, Non-stoichiometry and semi conductivity, Insulators on the basis of band theory.
3) The nature of solids, Know the crystal structures of solids, Draw the simple cubic, BCC and FCC structures. Identify the C.N. of an ion in ionic solid, Identify the type of void, the effect of radius ratio in determining the crystal structure, Be able to define Pauling's univalent radius and crystalradius.
4) The homogeneous catalysis, Give examples of homogeneous catalysts, Understand the essential properties of homogeneous catalysts-Give the catalytic reactions forWilkinson's Catalysis, Ziegler Natta Catalysis, Monsanto acetic acid synthesis, Give the brief account of homogeneous catalysis.
5) Understand the essential properties of heterogeneous catalysts, Give the catalytic reactions for oxidation, reduction and cyclization processes, Give the brief account of biodiesel synthesis using heterogeneous catalysis, Enlist the catalysts used for benzimidazole synthesis

Course: 3) Organic Chemistry (CH-343) :

The learner will be acquired with sound knowledge of –

1) Formation of carbanions, Possible mechanism of some known name reactions involvin carbanions, Synthetic applications some reagents, To predict product/s or supply the reagent/s for these reactions
2) Terms Disconnection, Synthons, Synthetic equivalence, Functional Group interconversion, Target Molecule, retrosynthesis, Various steps involved in the synthesis of some molecules.

3) Rearrangement reaction, Different types of intermediate in rearrangement reactions, To write mechanism of some named rearrangement reactions.
4) Spectroscopy, Different regions of electromagnetic radiations, Various terms used in Spectroscopy, The interaction of radiation with matter, Types of energy levels with Diagram, Brief idea about the advantages of spectroscopic methods.
5) UV Spectroscopy and Beer's law, Different types of electronic excitations, Various terms used in UV spectroscopy, Effect of conjugation on UV band, To calculation of lambda max for dienesand enone systems, range of vision region, Applications of UV Spectroscopy.
6) The principle of PMR, Various terms used in PMR spectroscopy, TMS is used as a reference Compound, To distinguish compounds by PMR.
7) Terpenoids and alkaloids, Various methods of isolation/extraction of these natural products, Synthesis of Citral and Ephedrin by Barbier- Bouveault and Nagi methods, To determine the structure of above compounds by chemical methods.

Course: 4) Analytical Chemistry (CH-344) :

The learner will be acquired with sound knowledge of –

1) Principles of solvent extraction, Difference between KD and D, Various types of techniques of solvent extraction such as-(a) extraction (b) continuous extraction (c) counter current extraction.
2) Principle of chromatographic methods, Relation between theoretical plates and column Efficiency, Column Chromatography, TLC, Paper Chromatography.
3) Principle of GSC and GLC analysis, Separation mechanism involved in GSC and GLC Instrumentation- stationary phases, column types, detectors, Working of gas chromatographic Apparatus, Chromatogram and use in qualitative-quantitative analysis.
4) Liquid chromatography, Separation mechanism involved in adsorption and partition HPLC Instrumentation and working of HPLC, Applications of HPLC, Advantages of supercritical fluid chromatography
5) Principle and theory of electrophoresis, Different types of electrophoresis techniques
6) Nephelometry and Turbidimetry as an analytical tool, Measurement of turbidance, Applications.

Course: 5) Industrial Chemistry (CH-345) :

The learner will be acquired with sound knowledge of –

1) polymer,Degree of polymerization,Classification of polymerization reactions, Thermodynamic and transport properties of polymer,Commercial polymers and their importance,Biomedical polymers: implants,Contact lens and dental polymers,

2) Importance of sugar industry, Manufacture of direct, Consumption (plantation white) sugar with flow diagram, Cane juice extraction by various methods,Clarification by processes like carbonation,Sulphitation,Phosphatation, etc., Concentration of juice by using multiple effect evaporator system,Crystallization of sucrose by using vacuum pan.
3) fermentation process,Manufacturing of ethyl alcohol by using molasses,Food grains, fruits & Ethylene, Manufacturing of wine, beer, whisky, rum etc.
4) Chemistry of soap, Students should know about various cosmetics,Raw materials,Properties and various types of cosmetics used, Meaning of the terms detergent,Surfactants, emulsion and emulsifying agents,Wetting and non-wetting,Hydrophobic and hydrophilic nature,
5) Preparation of dye intermediates,Structural features of a dye; Classification of dyes, Structures and applications,Nitro, nitroso,Azo, heterocyclic, Phthalenes etc.
6) Action of drugs,Assay of drugs and factors affecting drug action,Metabolism of drugs, Chemical structures,Methods of production and pharmacological activity.
7) The students are expected to learn all the problems of pollution and deposal of waste of Various industries.

Course: 6) Nuclear Chemistry (CH-346A) :

The learner will be acquired with sound knowledge of –

1) Discovery of nuclear fission, The process of nuclear fission, The charge distribution, Fission Energy, Theory of nuclear fission.
2) The natural Uranium reactor, The breeder reactor, The four factor formula, Classification of Reactors, India's Nuclear Energy programme.
3) Gaseous ionization and its applications, Principle and working of Scintillation Counters, Semiconductor detectors, Neutrondetectors.
4) The Probing by isotopes, Typical reactions involved in the preparation of radioisotopes, Szilard-Chalmer reaction, Analytical applications – Isotope Dilution Analysis, Neutron Activation Analysis,adiometric Titrations, Medical applications such as thyrodisis and Radioimmunoassay.
5) Biological effects of radiations, safety standards, safe working methods, Reprocessing of the nuclear waste and its management.

Practical Courses-

Course: 7) Physical Chemistry Practical:

The learner will be acquired with sound knowledge of –

1) Principles of Chemical kinetics, Viscosity, Adsorption, Colorimetry, Refractometry, pH

metry, Potentiometry, Conductometry etc.

2) Handling of above instruments.
3) Data analysis & drawing of graph.
4) Preparation of stock solutions, Normal, Molar solutions.
5) Standardization of instruments.

Course: 8) Inorganic Chemistry Practical:

The learner will be acquired with sound knowledge of –

1) Gravimetric & Volumetric analysis or estimations.
2) Principles & Handling of Colorimetry.
3) Qualitative analysis of inorganic salts.
4) Preparation of stock solutions, Normal, Molar solutions.
5) Preparation of Inorganic compounds.

Course: 9) Organic Chemistry Practical :

The learner will be acquired with sound knowledge of –

1) Separation of binary mixture & its analysis.
2) Organic estimations, preparations.
3) Purification- Recrystallization, Distillation, Separation methods- TLC.
4) Small scale preparations & its analysis.

Botany

BOT. 331 Cryptogamic Botany

1) Know the salient features of Cryptogams plants.
2) Become aware of the status of cryptogams as a group in plant kingdom.
3) Understand the life cycles of selected genera.
4) Learn about the economic and ecological importance of Cryptogams plants

BOT. 332 Cells And Molecular Biology

1) Gain knowledge about “Cell Science.
2) Understand Cell wall Plasma membrane, Cellorganelles and cell division
3) Learn the scope and importance of molecularbiology.
4) Understand the biochemical nature of nucleicacids, their role in living systems, experimental
5) Evidences to prove DNA as a genetic material.
6) Understand the process of synthesis of proteinsand role of genetic code in polypeptide

formation.

BOT. 333 - Genetics And Evolution

1) Understand the "Science of Heredity".
2) Realize the role of genes in evolution of species.
3) To understand linkage, segregation and mutation of genes during evolution.
4) To study the evolution in living organisms

BOT. 334 – Spermatophyta And Paleobotany

1) Understand Gymnosperms with respect to Angiosperm and Paleobotany.
2) Angiosperms, economic importance and distinguishing characters, comparison with Classification
3) Understand the important fossil types in different groups of plants and Indian fossil records
4) Realize the applied aspects of Paleobotany
5) Learn about the characters of biologicallyimportant families of angiosperms.

BOT. 335 – Horticulture And Floriculture

1) To understand scope, importance & disciplines of horticulture.
2) To familiar with horticultural zone of Maharashtra & India.
3) To understand different horticultural practices &methods.
4) To study role played by green & playhouses in horticulture.
5) To understand production technology, harvesting technique
6) To understand Flower industry, Dry flower, cut flower

BOT. 336 – Computational Botany

1) To understand Biostatistics, Sample and sampling.
2) To understand Collection and representation of data.
3) To understand Measures of central tendency of grouped and ungrouped data.
4) To understand Measures of dispersion, Correlation and regression.
5) To understand Probability and types of theoretical probability distribution

[SEMESTER-IV]

BOT. 341 – Plant Physiology And Biochemistry

1) To understand Photosynthesis, Respiration, Translocation of organic solute.
2) Understand the stress physiology.
3) Understand the current status of Biochemistry.
4) Realize the industrial application ofBiochemistry
5) Understand the importance of Bio-molecules.

BOT. 342 – Plant Ecology And Biodiversity

1) Know the scope and importance of thediscipline.
2) Understand plant communities and ecologicaladaptations in plants.
3) Learn about conservation of biodiversity, NonconventionalEnergy and Pollution.
4) Discover botanical regions of India andvegetation types of Maharashtra.
5) Understand Bioremediation, Global warmingand climate change.

BOT. 343 – Plant Pathology

1) Know the terminologies in plant pathology.
2) Understand the scope and importance of PlantPathology.
3) Know the control measures of plant diseases
4) Know the Disease development, defense mechanism.

BOT. 344 – Medicinal And Ecomonic Botany

1) Student will understand the Pharmacognosy Ayurvedic botany, Analytical Medicinal botany
2) Understand the Cultivation, collection, processing of herbal drugs.
3) Know the medicinally important plant.
4) Understand the economic botany and its scope
5) Know the evolution, uses, source of various economically important plant.

BOT. 345 – Plant Biotechnology

1) Understand the fundamentals of totipotencyplant tissue culture techniques.
2) Know the transgenic technology for theimprovement of quality and quantity of plant And thereby product.
3) Understand the advantages of in vitropropagation in various areas.
4) Realize the application and importance of plant tissue culture and transgenic plants.

BOT. 345 – Plant Breeding And Seed Technology

1) Understand the science of plant breeding.
2) To introduce the student with branch of plantbreeding for the survival of human being from Starvation.
3) To study the techniques of production of newsuperior crop verities.
4) To understand the seed technology.
5) Know seed certification, Processing, sampling, storage and packaging.

Practical Course Based On Theory Courses

1) To understand Study of Algae, Fungi, Bryophytes, Pteridophyteswith respect to systematic position thallus structure and reproduction[Nosotc, Chara, Sargassum and Batrachospermum; Rhizopus, Saccharomyces and Puccinia.Marchantia, Anthoceros and Polytrichum; Psilotum, Selaginella and Marsilea.]
2) Know Cytological techniques-preparation of Fixatives, preparation of stains (Acetocarmine and Aceto-orcein).
3) To understand Study of Chromosomes Morphology,various stages of mitosis and meiosis
4) Extraction and estimation of RNA& DNA.
5) To understand Study of structural heterozygotes, Induction of tetraploidy, observation of Tetraploid cells
6) To solve Genetic problems on gene mapping.
7) Study of *Pinus & Gnetum* with the help of permanent slides and plant material.
8) To know Study of garden tools and implements, Methods of cutting, layering, budding and Grafting, training and pruning, cutting flowers, making dry flowers
9) To know Computation of mean, mode, median, variance and standard deviation Representation of data, Statistical problem solving, correlation and regression
10) Germination of various seed, Analysis of vegetation data, quadrat method for frequency, Analysis of satellite data,
11) Estimation of chlorophyll & proteins, Separation of photosynthetic pigments
12) Demonstration of Ringing experiment, Hill reaction, Qualitative tests for alkaloids, tannins, Glycosides, starch, lipids and proteins
13) Study of polluted water body, physicochemical properties of water, Application of diversity indices to suitable ecosystem
14) Preparation of any one culture, Culture technique, Koch's Postulates
15) Study of any two of fungal, viral, non-parasitic, fungicides and microbial Pesticides

16) To know any six drug plants, of Plant extraction methods,Study and preparation Of Ayurvedic formulations.
17) Understand the Qualitative analysis of Alkaloid, Glycoside and Tannin
18) Study of stomatal index and vein islet number using suitable plant material using Micrometer and camera Lucida.
19) Get an idea about Survey of local flora with respect their medicinal and economic Importance and submission.
20) Preparation of Visit report or Tour report.

Physics

PH-331: Mathematical Methods in Physics I

1) Describe different methods in physics to solve problems in physic
2) To understand special theory of relativity – length contraction, time dilation, variation of mass with velocity.
3) To study general and orthogonal curvilinear coordinate system

PH 332: Solid State Physics

1) To understand basic structure of solid material and their properties.
2) X- ray diffraction and Bragg's diffraction condition, Ewald's construction, Debye Scherer method.
3) Characterizations of solid material- Thermo Gravimetric Analysis (TGA) Spectroscopy: Ultra-Violet (UV), Electron Spectroscopy : Scanning Electron Microscopy (SEM)
4) To understand band theory of solid.
5) To learn the basic magnetic properties of materials.

PH-333: Classical Mechanics

1) To understand the Mechanics of system of particles.
2) To study the motion in central force field.
3) To study and understand the concept of scattering of particles.
4) To study the Langrangian and Hamiltonian dynamics.
5) To understand the concept of canonical transformation and Poisson's bracket.

PH-334: Atomic and Molecular Physics

1) To study the atomic structure by different theories.

2) To study the effect of one and two valance electron system. Including Pauli's exclusion principle, spectral terms, spin-orbit interaction, Lande's interval rule.
3) To study the Zeeman Effect and Stark Effect.
4) To study the X-ray Spectroscopy, Molecular Spectroscopy, Raman Spectroscopy.

PH-335: Computational Physics

1) To learn the basic concept of Java Programming. To develop programming logic.
2) To understand how to use programming in day to day applications.
3) To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
4) To improve quality software development practices.
5) To boost and inspire students in professional skills related to Software development in Industries.

PH-336 Elective I: E Renewable Energy Sources

1) To understand the conventional and non conventional energy sources.
2) To study the structure and characteristics of the sun.
3) To understand the principle, construction and working of the flat plate collector, solar distillation, solar drying, solar cooker etc.
4) To study and understand the concept of photovoltaic system.
5) To understand the bio-mass conversion technology.
6) To study the wind energy and understanding the classification and description of wind machins.

PH-341: Classical Electrodynamics

1) To study the different laws of electrostatics. Such as Coulomb's law, Gauss law etc.
2) To understand the concept of method of image charges.
3) To study the different laws of magnetostatics. Such as Biot-Savart's law, Ampere's law.
4) To understand the B-H curve.
5) To study the development of Maxwell's equations.

PH-342: Quantum Mechanics

1) To understand the basic concept of quantum mechanics.

2) To learn applications of Schrodinger's equation – free particle in 3D, Step potential, barrier potential, one dimensional harmonic oscillator, and rigid rotator.
3) To understand commutator in quantum mechanics.

PH-343: Thermodynamics and Statistical Physics

1) To understand the kinetic theory of gases.
2) To study the Maxwell relations and its applications.
3) To understand the concept of statistics.
4) To understand the different statistical distributions.
5) To understand the ensemble theory and quantum statistics.

PH-344: Nuclear Physics

1) To study the basic properties of nucleus.
2) To study the radioactivity and nuclear forces.
3) The understand the working of different accelerators and detectors.
4) To study the different nuclear reactions.

PH-345: Electronics- II

1) To study the principle and working of diodes and transistors.
2) To study and understand the working of JFET and MOSFET.
3) To study the Operational Amplifier and IC555.
4) To understand the construction of combinational circuits and logic gates.

PH-346 Elective II :K Lasers

1) To understand the concept of laser.
2) To study the laser action, laser oscillator and laser output.
3) To understand the different characteristics of laser.
4) To study the types and applications of laser.

PH-347: Laboratory Course I

1) To understand basic concept through practical.
2) To use skill and create innovative experimental setup.

3) To understand general physics experiment- mechanics, heat, Magnetics and optics.

PH-348: Laboratory Course II

1) To understand electronics practical and their design.
2) To understand laser characteristics and renewable energy sources
3) To create programmed by using 'c' language.

PH-349: Laboratory Course III (Project)

1) To develop a set of skills pertaining to the laboratory work apart from the cognition of students.
2) The student upgrade knowledge of clear and strong link with the principles of basic physics and/or their applications.
3) Better understanding of physics concepts and brings out the creativity in the students.
4) Student develop the skills and understanding of the physics concepts at the time of presentation of the final report viva voce.

B.Sc. Wine, Brewing & Alcohol technology

FYBSc WBAT

[SEMESTER-I]

WBAT-111 Basic Microbiology Paper - I

1) To understand the History, Branches and Scope of Microbiology.
2) To know Importance, occurrence and types of microorganisms.
3) To learn Microbial Physiology**,** Cell Biology, bacterial cell organelles, cell wall, cell membrane,Capsule, endospore, flagella, types of flagella, mechanism of flagellar movement.
4) To understand Cell inclusions (Gas vesicles, carboxysomes, PHB granules, metachromatic Granules, and glycogen bodies, starch granules, magnetosomes, sulfur granules, chlorosomes.
5) To know Microbiology of yeast**.**

WABT-112 Industrial Microbiology

1) To understand Industrial Microbiology, Definition & Scope of Industrial Microbiology.
2) To understand Historical development in fermentation industry, Microbiology in industry
3) To learn Sterilization technique, Concept of asepsis, disinfection.

4) To learn Sterilization, Sterilization by Heat, Sterilization by radiation, Filtration& its types
5) To know Disinfectant types, action & applications, fumigation, pure culture techniques.

WBAT-113 Introduction to Botany

1) To understand Botany - Definition and Multidisciplinary nature of Botany.
2) To know Plant as a living system, Unique features of plants ,Plant diversity.
3) To learn Morphology of vegetative plant organs, Structure of typical plant,parts of plant .
4) To understand Reproductive development, Inflorescence, Types of inflorescence and Significance Of inflorescence ,Fruit & its types
5) To know the unique features of a plant cell, Cell cycle, cell division, mitosis and meiosis
6) To understand Programmed Cell Death- ageing, senescence and necrosis

WABT-114 Plant Development and Anatomy

1) To know Unique features of plant, Shift from vegetative to reproductive phase & factors Affecting.
2) To understand Microsporogenesis, Megasprogenesis, Double fertilization and triple fusion
3) To learn Plant growth regulators and their role in growth and development.
4) To understand Plant Anatomy Definition, concept, scope and objectives.
5) To understand Meristem & Meristematic tissue system: Types of meristematic tissues based on Their position & function.
6) To understand Structure & function of simple tissues, Complex tissue, Concept of Mechanical Tissue system Epidermal & Secretary tissue system,
7) To know Anatomy of Monocot & Dicot (root, stem & leaf)

WABT-115 Basic Biochemistry Paper - I

1) To understand Biochemistry, Concept & scope of Biochemistry.
2) To know Application of biochemistry in wine science.
3) To know water Types of bond, Covalent and non-covalent interactions in biomolecules. Properties of water, biological molecules in water
4) To understand Buffers - Biological buffers-concept, types and their importance
5) To learn Carbohydrates, Classification of carbohydrates, Functions of Carbohydrate .
6) To understand Lipids, Classification of lipids, Structure, chemical and physical properties, Function of lipids.

WBAT-116 Metabolic Pathways Paper - I

1) To understand Bioenergetics, Concept of bioenergetics, Concept of free energy, Laws of thermodynamics and their relevance to metabolism.
2) To know Metabolism: Definitions & Concepts: Catabolism, anabolism, anapleurotic reactions.
3) To learn Carbohydrate metabolism, Glycolysis, T.C.A. cycle, Fermentation.
4) To understand Electron transport System, Fatty acid degradation- β- oxidation in relation to energy Production.

WBAT-117 Wine Technology

1) To understand Wine making, important terminologies of wine.
2) To know Viticulture, Introduction to viticulture, important terminologies.
3) To know Wine history.
4) To learn Classification of wine: Generic classification, varietal classification, Vinification Classification and classification on the basis of chemical Constituents.
5) To understand Flow chart of white wine, Red wine, Sparkling wine, Production of wine from fruits
6) To know Grapevine, Classification, function of grapevine.
7) To understand Introduction to barrel: Distribution, species and advantages of oak.

WBAT-118 Sensory Evaluation of Wine Paper - I

1) To understand Sensory evaluation and terminologies
2) To know the basic tastes of wine, Sensory perception, Factors influencing taste perception.
3) To learn the art of tasting wine – color, aroma and taste of wine. Neurophysiological mechanism Of tasting, Sensory evaluation and scorecard, aroma wheel.
4) To understand Design of tasting room, timing of tasting wine, Taste the wine on the basis of Vision, smell and palate structure.
5) To know Selection & different types of glass, serving wine, Opening the bottle etc.

WABT-119 Practical's in Microbiology

1) To know the Safety Measures and Good Laboratory Practices in Microbiology laboratory.
2) Understand the operation, precautions and use of common microbiology laboratory Instruments
3) To learn the use of common laboratory glass wares, learning basic techniques in Microbiology

4) To know Microscope-Compound Microscope & its parts. Use of oil immersion objective.
5) Basic staining techniques, Monochrome staining, Negative staining, Staining of Endospore Staining of Capsule
6) To Understand the Hanging drop preparation for observation of motility.
7) To know the Preparation of liquid medium -nutrients broth, Sabouraud broth and PDB, agar Medium, agar Slant and PDA
8) Wet Mount slide preparation and its observation – Fungi. Slide culture technique

WABT-1110 Practical's in Botany

1) To Understand the Study of typical plant and plant parts
2) To learn Observation of different types of inflorescence in plants.
3) To learn Observation of parts of flower
4) To Understand Study of different types of fruits
5) To learn Study of plant cell types using squash techniques and Maceration
6) To know Study of Programmed Cell Death in plants
7) To Understand Study of meristematic tissue system
8) To know Study of complex and permanent tissue system.
9) To Understand Study of trichomes & secretary tissue system
10) To learn Observation of typical monocot & Dicot root and stem.

WABT-1111 Practical's in Biochemistry

1) To learn Safety Measures and practices in chemistry laboratory.
2) To Understand Molarity, molality, normality, ppm, ppb.
3) To learn Laboratory Equipments: Working Principle and Handling
4) To know Preparation of Buffers of desire pH and Molarity
5) To Understand Determination of alkalinity of water.
6) To learn Titration of Strong acid with the strong base.
7) To know Titration of Weak acid with strong base.
8) Determination of Ascorbic acid.
9) To learn Estimation of reducing sugar by DNSA method.
10) To Understand Paper chromatography&TLC of sugars &amino acids.

WBAT-1112 Practical's in Wine Technology

1) To learn Wine technology Laboratory and common Wine technology laboratory instruments.
2) To Understand Identification of grape and wine varieties.

3) To know small survey andReport writing.
4) To know study threshold detection of acid taste.
5) To Understand study threshold detection of sweet taste.
6) To learn study threshold detection of bitter taste.
7) To Understand study threshold detection of bitter taste.
8) To learn Study of aroma wheel.
9) To Understand types of wine glasses.

SEMESTER –II

WBAT-121 Basic Microbiology Paper - II

1) To understand Microscopy Principles and applications microscope.
2) To know Microbial Growth, Reproduction in microorganisms and Measurement of Bacterial Growth
3) To understand staining techniques, properties and role of fixatives, types of stain

WBAT-122 Industrial Microbiology Paper-II

1) To understand fermentation medium, Role of nutrients in microbial growth.
2) To learn Antifoam agents, Stock cultures and its maintenance
3) To know Industrial microbiological products as Primary and secondary metabolites.
4) To understand Concept of fermentation and types of fermentation.
5) To learn Primary and secondary screening, Strain improvement, Inoculum preparation.

WBAT-123 Plant Physiology

1) To know Physiology –Definition, concept.
2) To understand Permeability, Diffusion, Osmosis.
3) To learn Absorption of water, Transpiration & Gutation, Overview of Photosynthesis & Respiration
4) To understand Translocation –Definition, concept, pathway of translocation, Source sink Relationship.
5) To understand Stress Physiology, Physiology of Flowering, Seed Germination, and Fruit Ripening.
6) To know Response of plants to biotic stresses and a biotic stresses.
7) To learn General classification, physiology of flowering, Metabolic changes during seed Germination & fruit ripening.

WBAT-124 Applied Botany

1) To understand Methods of Plant Propagation, Sexual propagation and asexual plant propagation
2) To learn Vegetative propagation, artificial propagation.
3) To know Plant Tissue Culture**,** Organization of plant tissue culture laboratory,
4) Media preparation & Aseptic techniques, its sterilization, Concept of differentiation, dedifferentiation and redifferentiation, Callus formation, organogenesis & embryogenesis.
5) To understand Organ culture technique.

WBAT-125 Basic Biochemistry Paper-II

1) To learn Proteins**,** Amino acids and their Classification, Protein structure, Protein denaturation And renaturation, Functions of proteins,
2) To understand Enzymes, general properties, enzyme activation and inhibition, Enzyme Classification.
3) To know Nucleic acids- Definition, general structure of DNA and RNA.
4) Understand the Vitamin**s** Classification**,** Biochemical functions .

WBAT-126 Metabolic Pathways Paper-II

1) To know Protein metabolism, Transamination and oxidative deamination, Nucleic acid Metabolism.
2) Understand the Nucleic acid Metabolism.
3) To learn Biochemistry of ethanol Fermentation, Concept of Primary & secondary metabolites Overview of anaerobic fermentations.
4) To understand Metabolic Regulation, Concept of homeostasis, Regulation at Enzyme level

WBAT-127 Introduction To Beer, Wine and Alcohol Technology

1) Understand the Traditional and Commercial winemaking practices.
2) To know Raw materials and equipment use in wine production, Automation in wine industry New concept in wine production.
3) To learn Introduction and History of Brewing, Basic concept of alcoholic beverages Alcoholic beverage and health, Status of Indian brewing, winemaking and alcohol.
4) To understand constituents of oak and liberation of oak flavors from the barrel in beer and alcohol.
5) To know Work with barrels, Oak chips versus oak barrels, Pre-fermentation actions.

WBAT-128 Sensory Evaluation of Wine paper-II

1) To know Concept of wine clarity, Wine aroma, New trends In the world of wine.
2) To learn tasting sheet, matching wine with food, Theory of food combination such as sweet, sour, salty and spicy food with wine.
3) To understand pre- tasting organization, tasting situations, tasting exercises, Study of Effervescence, ISO standard glass, Tears.

WBAT-129 Practical's based on Microbiology

1) To know Isolation of bacteria and yeast from natural sources.
2) Observation of the growth of cultures, and reporting of colony and cultural characteristics.
3) To understand Isolation of microorganism by streak plate method,spread plate method Pour plate method.
4) To learn Yeast for enumeration of yeast by Neubauer's chamber.
5) To know Effect of pH, salts, Temperature, on Microbial Growth.
6) To understand Aseptic Transfer Techniques, Microscopic observation of fungi. Preservation of cultures on slants.

WBAT-1210 Practical's based on Botany

1) To know osmosis and turgor pressure, Diffusion Pressure Deficit, translocation in plants.
2) To understand rate of respiration, Study of stomata and transpiration in plants
3) To learn Separation of leaf pigments by strip chromatography.
4) Preparation of nursery beds and rising of plants by different propagation methods.
5) Understand the Stock solutions & media preparation Effect of plant growth regulators on in vitro response of explants.
6) To know Initiation of shoot tip & axillary bud culture, anther culture

WBAT-1211 Practical based on Biochemistry

1) To know Qualitative test for carbohydrate, Lipid/ Proteins.
2) To learn pH measurement Use of pH indicator ,Use of pH meter
3) Understand the Carbohydrate estimation by phenol sulphuric acid method,
4) To know Paper chromatography of amino acids, TLC of lipids
5) To understand Protein estimation Folin Lowry method. Biuret method.
6) Extraction of lipids in organic solvents, Enzyme assay, Determination of chlorine content in water.

WBAT-1212 Practical based on Wine Technology

1) To know scoring of wine using different tasting sheet.
2) Understand the Sensory evaluation, matching wine with food.
3) Learn the Effect of age on the appearance, serving temperature, sensory evaluation of wine.
4) Understand the Interaction of sweet and acid taste, bitter taste.
5) The sense of feel, Identification of off odors in wine.

SYBSC WBAT
Semester-III

WBAT - 231: Yeast Technology Paper – I

1) Understand theImportance of yeast strains in wine making.
2) Maintenance of yeast strains and preservation of it,Yeast culture techniques.
3) Learn theNormal micro flora and pathogens of grapevine.
4) To knowTypes of microbial spoilage of wine, Prevention of microbial spoilage Curing and storage of wine.

WBAT-232 Fermentation Technology Paper-I

1) To study about fermentation process and various types of ferment.
2) The learner will acquired the knowledge of various parts of ferment.
3) To study about the manufacturing process of Fermenter.
4) To learn about various utilities required for fermentation.

WBAT–233 Brewing Technology – I

1) To understand the different Beer Styles
2) Learn the Origins of Style, Methods Used to Define Brewers Association's Beer Style Guidelines.
3) To know Outline of the Brewing Steps (Malts, Adjuncts ,brewing liquor, milling, mashing, Wort separation, Wort boiling, Trub removal, Wort cooling/aeration , Yeast handling, Yeast pitching, Fermentation , Yeast removal, Aging, Clarification, Packaging , Warehousing and distribution)
4) To understand the barley (Structure and function: the husk the pericarp, testa, Aleurone Layer, Starchy Endosperm, The Embryo)
5) Learn the Malt Production (Drying, Storage, and Handling, steeping, Germination, Kilning and Malt Quality, Malt varieties)

WBAT-234 Alcohol Technology – I

1) Study the Role of wine technologist in distillery (Scope & functions of technical person in In distillery)
2) Learn the Raw materials used in alcohol production (Sugar containing; starch Containing and cellulosic raw materials.)
3) Study the Stoichometry
4) Understand the Beverage alcohol products-Pot and continuous distillate products for Making maturation & white sprits

WBAT-235 Biochemistry Paper-III

1) Study the general methods of extraction & purification of metabolites.
2) Learn the different techniques of Centrifugation, Crystallization, ion exchange, Electro dialysis & Solvent extraction.
3) Study the Phenolic compounds present in wine.
4) Understand the process of Malolactic fermentation & its role in wine making process

WBAT-236 Vineyard Technology Paper – I

1) To understand the study of soil and its function, Physical and Chemical properties of soil.
2) Learn the Principles of weathering of rocks and materials.
3) To know Study of vineyard establishment, Relationship of grapevine and climatic factors.
4) To understand Selections of grape (wine grapes) varieties for plantation,Method of plantation.
5) Learn the Care of young vine, Weed control.
6) To understand Definition and concept of canopy, Canopy microclimate, Training and pruning Practices.

WBAT-239 Practical's course –I

1) To Study the of effectiveness of hand washing.
2) To understand the preparation of Nutrient media and Morphological identification of yeast
3) To know the reparation of Nutrient media and Morphological identification of LAB & AAB
4) To learn determination of cell density of given microorganism by Turbidiometry method
5) To Study Isolation of yeast from infected grape or must and its identification.
6) To learn Determination of aptitude of yeast to form hydrogen sulphide
7) To Study Determination of sensitivity of yeast to antibiotic streptomycin.
8) To understand Effect of variable pH on yeast growth.
9) To determine the thermal death rate of the given organism (TDR).
10) To know the Determination of thermal death time of the given organism (TDT).

11) To study the effect of U.V radiations on Microbial growth
12) To learn the Case study-culture preservation methods.
13) To know the Bacterial motility by swimming growth method.

WBAT-2310 Practical's course –II

1) To know the technique of collecting and preserving representative sample of soil
2) To understand the particle size of the soil sample.
3) To know the water holding capacity of the given soil sample
4) To learn the temperature and pH of the soil sample
5) To know the conductivity of the soil sample by using specific apparatus
6) To understand calcium and magnesium contents of the given soil sample
7) To know the Phosphorus and Nitrogen in the given soil sample
8) To study the alkalinity, Chlorides and Sulphates contents in the soil sample
9) To study grape varieties suitable for propagation in a favorable climatic conditions
10) To study method of plantation, irrigation and supply of nutrients for the grape plants
11) To observe and study the morphology of weeds occur in vine yard
12) To know the training and pruning techniques in vineyard for canopy management
13) To understand and observe nutrient deficiency in grape plant
14) Field visit to nearby Vine Yard and submission of a report

WBAT-2311 Practical's course –III

1) To understand the Determination of total, fixed and volatile acidity rectified sprit.
2) To learn the Fusel oil determination in sprit sample.
3) To conduct potassium permanganate test for finding the quality of spirit
4) To know the Determination alcohol content of given spirit by hydrometer method
5) To understand the Determination alcohol content of given spirit by specific gravity method.
6) To learn the Reduction and blending of sprit
7) To observe the Sampling & grading of barley
8) To understand the Estimation of protein content of barley by suitable method
9) To determine the Brix, specific gravity of the molasses.
10) To know the pH of the molasses and wort
11) To determine the reducing sugars in the given molasses sample
12) To understand the Microscopic observation of alcoholic fermented wash
13) To know Estimation of residual sugar in molasses fermented broth
14) To understand the Estimation of alcohol content in molasses fermented broth

15) To know the Estimation of volatile acids in molasses fermented broth
16) Visit to brewery or distillery and submission of the report

Semester-IV

WBAT-241 Yeast technology Paper-II

1) To understand the Preparation of yeast starter cultures, contamination of yeast, growth of yeast.
2) To know Role of yeast in grape flavor development, transformation of Aromatic substances.
3) Learn the Significance of yeast and bacterial enzymes.
4) Controlling degree of anaerobiosis, Killer factors in fermentation.

WBAT-242 Fermentation technology paper-II

1) To understand the Types of Inoculum
2) To know the Media Formulation, Media Optimization
3) To understand the Media Sterilization principles
4) To learn the Process parameters and their importance
5) To know the Products of fermentation**,** Oriental fermented foods, the microbial production of Organic acids, the microbial production of amino acids, Fruit based alcoholic beverages.

WBAT-243 Wine Technology –I

1) Understand the Red wine – objectives**,** red wine varieties and styles, making of rose style wines.
2) To know red wine making process, differentiate it from white wine making.
3) To learn evaluation of a number of Australian red wine styles, Red wine making process.
4) Learn the Bottling- maturation in bottle.
5) To understand the Influence of climate, temperature, humidity & seasonal fluctuations.
6) To know managing wine grape garden under aberrant climate conditions.

WBAT-244 Wine technology –II

1) To learn the Production of white wine, White Wine objective, Varieties and style.
2) To understand the physiology of grape: Component, principal, location, fate.
3) To know White wine making process, Harvesting, crushing, pressing, juice, addition of active yeast
4) Control of fermentation parameter, Clarification and stabilization, Maturation and aging.
5) Understand the Blending, bottle aging and post bulk operation.

6) To know Cooperage for wine making**,** oak barrel making in world.
7) To learn Racking: role and technique, Theory of protein fining, fining teachings, and products used In Fining, Clarification treatment.

WBAT-245 Waste treatment paper-I

1) To understand the Fermentation industry waste, Wastewater composition, characterization studies
2) Learn the Physical Unit Operations, Flow measurement, Screening.
3) To know Accelerated gravity separation, Flotation, Granular medium filtration.
4) Understand the Chemical Unit Processes, Chemical precipitation, Disinfection, Dechlorination.
5) To learn the Biological Unit Processes**:** Aerobic, Anaerobic, Denitrification, and Biosorption.

WBAT-246 Vineyard Technology Paper-II

1) To learn the Production of white wine, White Wine objective, Varieties and style.
2) To understand the physiology of grape, Component, principal, location, fate.
3) To know White wine making process, Harvesting, crushing, pressing, juice, addition of active yeast
4) Control of fermentation parameter, Clarification and stabilization, Maturation and aging.
5) Understand the Blending, bottle aging and post bulk operation.
6) To know Cooperage for wine making**,** oak barrel making in world.
7) To learn Racking: role and technique, Theory of protein fining, Fining teachings, and products used in Fining, Clarification treatment.

WBAT-249 Practical Course -I

1) To learn the Evaluation of alcohol as skin detergent
2) To understand the Visualization of yeast by vital staining.
3) To know Inoculums development of yeast and determination of exponential phase of growth
4) To learn Microscopic observation of yeast during all stages of wine production
5) To learn the Determination of viable count of yeast from fermenting wine sample by Neubars Chamber
6) To understand the Preparation of slide culture method
7) To know Study of normal flora of grape berry and leaf.
8) To learn Measurement of growth of wine yeast(Direct cell count)

9) To study the effect of alcohol concentration on yeast growth
10) To know Log sheet of fermentation and its graphical representation
11) To learn Isolation of bacteria (E.Coli) from wastewater, Perform confirmed test for coliform Bacteria & biochemical identification by IMViC test
12) To know the Fermentation waste and their utilization for the production of value added product
13) To understand the Determination of ability to produce acetic acid by yeast strain.
14) To understand the Checking efficiency of disinfectant with phenol coefficient technique

WBAT-2410 Practical Course –II

1) To learn the techniques of Stem cuttings and its propagation
2) To learn the technique of "Whip" grafting for propagation of grape plants
3) To learn the "tongue" grafting for propagation of grape plant
4) To know the technique of "T" budding for propagation of grape plant
5) To study and observe the anatomy of the stem of grape plant
6) To study the morphology, anatomy and microscopic features of a matured berry of grape
7) To study and learn harvesting techniques of matured grape fruits
8) To study the morphological and anatomical structure of infected part of Powdery mildew of grape Leaf.
9) To study the morphological and anatomical structure of infected part of Downey
10) To study the morphological and anatomical structure of infected part of Anthrancnose of grape leaf
11) To observe and study the different disorders like pink berry, water berry, short berry, of grape fruits
12) To study and observe nutrient deficiency symptoms of Nitrogen, Phosphorus and Magnesium in Grape plants.
13) To study different equipment and implements used in Vineyard
14) To study the morphological characters of wine verities of grape berries
15) A field visit to nearby winery and submission of the report

WBAT-2411 Practical Course –III

1) To study the Determination of pH of juice (grape or any fruit)
2) To know the Determine the total acidity of juice (grape or any fruit)
3) To Study the total soluble solids of grape juice/wine/must by refractometry
4) To Study the total soluble solids of grape juice/wine/must by hydrometry

5) To understand the Determination of pH of wine red wine & white wine
6) To learn the Determination of sulphur-di-oxide by ripper method.
7) To know the Determination of reducing sugar by Lane and Eynon method
8) To understand the Innovative idea or concept in wine production world: A case study
9) To Study the Determination of volatile acidity, fixed acidity and tiratable acidity in wine
10) To know the Conduct heat stability test for protein stability in wine
11) To learn the Alcohol estimation in wine
12) To Study the Sensory evaluation of sparkling wines
13) To study the Sensory evaluation of dessert wines

TYBSC WBAT

SEMESTER-V

WBAT-351 BASIC CHEMICAL ENGINEERING

1) To understand Basic Fluid flow and fluid mechanics, Properties of liquids, Measurement of Viscosity, handling systems for Newtonian liquids.
2) To know Mechanical Energy Balance, Pump Selection and Performance, Flow Measurement.
3) To learn Liquid filtration, filter media, classification of liquid filtration, formation of filter cake.
4) To understand Membrane filters, ultrafiltration microfiltration Sizing of filtration equipment.
5) To learn Heat Transfer and Thermal Processing, heating and cooling of liquids, Plate heat.
6) To learn Energy for Wine Processing, Steam generation, Electric Power utilization.

WBAT-352 EQUIPMENTS AND UTILITIES

1) To understand Utilities, Electric supply, humidifiers, Air-conditioning, humidifiers, Dehumidifiers, Chilling system, Gas Supply, Lighting, Catwalks and man ways, Computers.
2) To learn Equipments, Process equipments, Cleaning, Hygiene and Sanitation equipments.
3) To know Material handling equipments, Functions, types, and uses of Pallet jacks, Forklifts, Man lifts, Barrel racks, Loading/Unloading bay/ platforms, Wine transfer pumps.
4) To learn Packaging equipments Functions, types, and uses of bottling machines.
5) To understand Special Lab equipments, sparkling wine making equipments.

WBAT-353 Health Benefits of Alcoholic Beverages– I

1) To Know Wine antioxidant – formation of reactive oxygen species and cell damage
2) To Learn Wine polyphenols as anti-oxidant and free radical scavengers
3) Understand Major wine anti-oxidant – procyanidins, salicylic acid, DHB'S, epicatechin, gallic acid, quercetin & resveratrol
4) To know French paradox & protective effect of moderate alcohol consumption, synergism of alcohol & antioxidant in wine
5) To understand Moderate alcohol consumption & associated health benefits – To liver, lungs, heart, anti-aging effect, reduction in various causes of mortality, ulcers, kidney stone, use of alcohol in treatment of fever & as antiseptic etc.
6) To Know Role of antioxidant in preventing – cardiovascular disease, cancer, gouts, anti-degenerative disease – Parkinson's Disease, Alzheimer's Disease, rheumatoid arthritis, fetal alcohol syndrome, antimicrobial effect of alcohol, allergies & hypersensitivity

WBAT-354- Microbial Spoilage and Other Defects

1) To Understand microbial spoilage, Origin of wine spoilage microorganisms, General features of spoilage microorganisms – yeast and bacteria and Identification of wine spoilage microorganisms.
2) To know Faults caused by yeast and molds, Faults caused by acetic acid bacteria, Faults caused by LAB - bitterness taint, diacetyl taint, geranium taint, ropiness mannitol taint, mousiness, refermentation, etc and Faults caused by other aerobic bacteria and cork induced spoilage.
3) To understand Killer factor- killer yeast, toxins, significance of killer yeast in wine making and Control of microbial spoilage
4) To Learn Concept of defect, defining flaws and faults, flaws appearance, Oxidation: - defect caused by acetaldehyde, acetic acid and Defect caused by sulphur compound –sulphuroxides, hydrogen sulphide ,mercaptans , dimethyl sulphide etc.

WBAT-355 Marketing of Alcoholic Beverages

1) To Understaand Fundamentals of Marketing, Basic Wine Marketing Principles and 4P`s of Marketing
2) To Understand Importance and functions of Marketing Management Henri Fayol 14 principles, Buying Motives of Wine, Beer and Alcohol Consumers, Importance of Studying Buying Behavior, Factors influencing buying behavior and Buying Decision Process

3) To learn Difference between Brand and Branding , Basics of Brand Positioning and Wine, Beer and Alcohol Branding
4) To Know Digital /Social Media Marketing of Wine, Brewing and Alcohol
5) To Learn Types of International Marketing (Export, Franchising, Licensing, Joint Venture), International Marketing strategy and Important Environmental Factor of Brewery, Winery Distillery, SWOT Analysis technique

WBAT-356 Business Management

1) To Learn meaning of Management, Development of Management Thoughts, Different Management Approaches, Scientific Management Approach, Administrative Approach, Behavioral Approach and International Marketing Approach
2) To Know Function of Management, Planning and organizing, Importance of Planning and organizing, Types of organization
3) To Understand Introduction to Entrepreneurship, Types of Entrepreneurships(Small, Startups, Large, MSME) , Differentiate between Business and Entrepreneurship and making business plans
4) To understand Method of Business Communication-Verbal, non-verbal, written, Upward – downward & horizontal, Soft skills – Definition, Importance, Elements of good speaking & listening, Interview skills, techniques of Interview,Business Letters – Meaning, Importance, Structure of Business Letter
5) To know Finance and Business Finance, Financial Management and Objectives of Financial Management

WBAT - 357: Practical course – I

1) To study the characteristics of simple distillation and Calibration of pH meter
2) To study the filtration of liquids through cake filters and Practical calculation of refrigeration loads for wine storage
3) Measurement of properties of liquids (must, wine, sugar syrups etc) using Specific gravity bottle and Hand held refractometer
4) Measurement of flow of liquids using Orifice meter and Venturi meter
5) Measurement of viscosity of liquids using Capillary tube viscometer, Rotational viscometer
6) Estimation of thermal death coefficient k for normal wine contaminants

WBAT - 358: Practical course – II

1) Effect of glucose and NaCl concentration on yeast growth.

2) Determination of sensitivity of yeast to antibiotic streptomycin.
3) Study of normal flora of grape berry and leaf.
4) Identification of lactic acid bacteria by biochemical methods.
5) Identification of acetic acid bacteria by biochemical method.

WBAT - 359: Practical course – III

1) To study and Compare Pricing strategies across various alcoholic brands in same sector and design your own Pricing strategy of either Wine/Beer/Alcohol
2) To Study the Profiles of Indian Alcohol Companies and compare Marketing Strategies of Various Alcoholic Brands (Any one Sector Wine/Beer/Alcohol)
3) To Study the Digital Marketing / Social Media Marketing Champaign of Wine / Beer / Liquor Brand
4) To develop SWOT Analysis of any Wine/Beer/ Liquor Brand
5) To study the Organisation structure of any Winery/Brewery/Distillery

SEMESTER - VI

WBAT- 361 Sensory evaluations of wine, beer and alcohol

1) To study Visual aspect in beer –concept of beer foam, beer foam components ,foam parameter and foam structure ,foam assessment, beer color and beer clarity, Flavor determinants of beer – Taste of beer –sweetness, sourness, saltiness, bitterness, Beer aroma and Beer flavor wheel
2) To know Liqueurs and their flavoring: - Basic concept of fruit and fruit flavored liqueurs, different botanicals used in liqueurs
3) To study Sauvignon Blanc wine style with respect to appearance ,aroma ,flavors , tastes and mouthfeel, Chardonnay wine style wine style with respect to appearance ,aroma ,flavors , tastes and mouthfeel, Riesling wine style wine style with respect to appearance ,aroma ,flavors tastes and mouthfeel
4) To understand Aroma taste, mouth & visual characteristics, flavor wheel , Sensory evaluation during whisky production during and of the finished product

WBAT-362 Waste Treatment Paper -II

1) To understand Waste, Pollutant, Sludge, Eutrophication, microbial Bioremediation, Phyto - remediation, Bio-stimulation, Bio augmentation, Xenobiotic Components
2) To study of Measurement of BOD, COD, TOD of waste water, BOD- Five-day BOD

procedure & extended BOD test manometric BOD test, BOD assessment is minutes, factor that contribute to variation in BOD-Seed, PH, temperature, toxicity, incubation time, nitrification, COD – Standard dichromate COD procedure, COD detectorand TOD - TOD analyzer

3) To understand Index organisms of sewage, laboratory method for detection of coliform, organism by MTF technique, MFT technique, Colilert technique, techniques to distinguish fecal bacteria from non –fecal bacteria

WBAT- 363 Health benefits of alcoholic beverages- II

1) To understand Outline of nutrient content of various alcoholic beverages – Wine &Cider, Nutritional aspects beer, Macronutrient contents of Alcoholic beverages, water, Alcohol, Carbohydrate, Nitrogenous Component, Lipid, Polyphenol etc.
2) To studty of Micronutrient Contents of alcoholic beverages – Vitamin, Minerals, Functional Elements, Phytochemical in wine, beer & Spirit & Liqueurs
3) To study Alcohol Catabolism By Alcohol dehydrogenase, Alcohol Catabolism By MEOS i.e., Microsomal Ethanol oxidizing system &By Catalase enzyme, Harmful Effects of excessive alcohol intake – Accident & Injuries, Alcohol Addiction, Cardiovascular Complication, gastro-intestinal disorder, liver problem, methanol & higher alcohol toxicity, nervous system and psychological disorder. Wine and allergies and hypersensitivity, headaches and dental erosion
4) To understand Emerging research on mealtime alcoholic consumption

WBAT-364 Maturation and Aging of Wine, Beer and Alcohol

1) To study Various cooperage oak wood use in whisky maturation, Cask manufacture –timber processing, Bourbon cask construction, control of heat treatment, cask regeneration oak
2) To learn Oak Chemistry & whisky maturation –Wood – derived aromas, Reaction affecting distillate components, Factor affecting whisky maturation
3) To study Maturation – warehouse. maturation time fill strength and Objective of wine aging, Chemical reaction occurring during wine aging,Extraction of phenolic compound from oak Factors affecting aging of wine
4) To study Objectives of Aging and Finishing, Component Processes, Flavor Maturation – Introduction, various important Flavor Compounds in beer

WBAT-365 Alcohol Marketing Law and Regulatory Policies

1) To study State Excise Policies and Revenue System across various States in India, Licensing,

Restrictions and Law related to Alcohol Marketing on Digital Media

2) To understand patent, Importance of Patenting, Laws regarding Patenting andTypes of Patents and their importance
3) To study shipping and logistics and its process. and Alcohol Shipment Procedure from India throughout the world, International Business related to alcohol Industry. Laws related to Illicit Alcohol in India
4) To learn Legal laws for people in India and Worldwide, Legal laws for Breweries, Wineries and Distilleries in India and worldwideand Taxation related to alcohol in India and Worldwide.

WBAT- 366 Wine Technology –III

1) To study Preparation of base wine: Harvesting, pressing, juice treatments, fermentation (primary and secondary), Base wine storage and selection, Assemblage and Triage addition, Riddling, Disgorging and Liquoring process
2) To understand Alternative process for the large-scale production of sparkling wine: The transfer process, Tank Process and Carbonation.
3) To study Chemical Constituents of Wines and Grapes, The secret of making wine and art of winemaker: Study on barrel and oak characteristics and New trends in the world of wine: Screw caps vs Cork
4) To understand Post fermentation process, Tartrate stability in wine, Protein stability in wine, Colloidal stability in wine, Immobilized agent for wine treatment

WBAT- 367: Practical's course –I

1) Calculate BOD of given sample(waste water /winery effluent)
2) Analysis of substances responsible for astringency, bitterness
3) Expression of senses perception (vocabulary); the types and methods of
4) Evaluation and the sensory evaluation by aroma wheel (varietal aroma, flavour and wood)
5) Performing and methods of sensory assessment (pair, three-angel, duo-trio test, the differentiation test, ranking test hedonic rating test and description analysis).
6) To determine the TSS and TDS from the given sewage sample

WBAT- 368 : Practical's course – II

1) Identify the type of haze formed in wines: proteins, pectin and glucans
2) Determination of total sugar as invert sugar in final molasses
3) Determination of Specific Gravity & Extract of wort
4) Determine the protein content of given wine /beer by lowry/ biuret method

5) To determine the moisture content and sterility of cork and Sterility checking of bottled wines
6) Estimation of alcohol content of beer by hydrometer and specific gravity method

WBAT - 369: Project Based On Wine or Beer or Alcohol Technology

1) Project work / Thesis / Dissertation shall be carried out under the supervision of a qualified teacher in the concerned Department./Research Institute/Industry
2) Project work / Thesis / Dissertation shall be pursued for a minimum of 12 weeks during the final semester.
3) The Project Report/Thesis / Dissertation report is to be prepared as per standard scientific research methodology and duly signed by the supervisor(s) and the Head of the Department shall be submitted to the concerned department.

BCS

FYBCS

Semster-I

Theory Courses

CS101 : Problem Solving Using Computer and 'C' Programming – I

1) Explore algorithmic approaches to problem solving.
2) Develop modular programs using control structures and arrays in 'C'. Course.

CS102 : Database Management Systems

1) Solve real world problems using appropriate set, function, and relational models.
2) Design E-R Model for given requirements and convert the same into database tables.
3) Use SQL.

Practical Course

CS103 : Practical course Problem Solving using Computer and 'C' programming and Database Management Systems Teaching

1) Devisepseudo codes and flowchart for computational problems.
2) Write, debug and execute simple programs in 'C'. Create database tables in postgreSQL. Write and execute simple, nested queries.

Semester-II

Theory Courses

CS201 : Advanced 'C' Programming Teaching

1) Develop modular programs using control structures, pointers, arrays, strings and structures
2) Design and develop solutions to real world problems using C.

CS202 : Relational Database Management Systems

1) Design E-R Model for given requirements and convert the same into database tables.
2) Use database techniques such as SQL & PL/SQL.
3) Explain transaction Management in relational database System.
4) Use advanced database Programming concepts

Practical Course

CS203 : Practical Course on Advanced 'C' Programming and Relational Database Management Systems

1) Write, debug and execute programs using advanced features in 'C'.
2) To use SQL & PL/SQL and perform advanced database operations.

Theory Courses

ELC-111: Semiconductor Devices and Basic Electronic Systems

1) Develop interest in study various types of semiconductor devices
2) Explore study elementary electronic circuits and systems

ELC 112: Principles of Digital Electronics

1) Students familiar with concepts of digital electronics
2) Learn number systems and their representation
3) Develop and understand basic logic gates, Boolean algebra and K-maps
4) Getting knowledge of arithmetic circuits, combinational circuits and sequential circuits

Practical Course

ELC-113: ELECTRONICS LAB IA

1) Use of 3 Pin Regulator IC 78XX & 79XX as a regulator in real life.
2) Develop the complete knowledge about of half wave, full wave and bridge rectifier circuit

with and without capacitor filters.

3) Get practical knowledge aboutOpto-coupler using LED and Photodiode and it's application as burglar alarm
4) Bipolar Junction Transistor as a Switch in real life.

Semester-II

Theory Courses

ELC 121: Instrumentation Systems

1) Get knowledge of Instrumentation System
2) Develop and explore various blocks of Instrumentation System
3) To study Smart Instrumentation System

ELC 122 : Basics of Computer Organisation

1) Make familiar with digital sequential circuits
2) Get knowledge about Basic computer Organization in real life
3) Develop knowledge about Memory architecture

Practical Courses

ELC-123: Electronics Lab IB

1) Study temperature sensor LM 35
2) Use of LDR to control light intensity
3) Study of PIR and tilt sensor.
4) Study of stepper motor and Use of OPAMP as comparator

Semester-I

MTC-111: Matrix Algebra

1) A students should be able to work with graphs and identify certain parameters and properties of the given graphs.
2) A students should be able to perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.
3) A students should be able to solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.

MTC 112: Discrete Mathematics

1) A students should develop an appreciation for the literature on the subject and be able to read and present results from the literature.
2) A students should be able to write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

Practical Course

MTC 113: Mathematics Practical

1) Getting knowledge of Maxima Software and using them in mathematics and its uses in real life.
2) Usingthese software students can solve and manipulate symbolic and numerical expressions, including differentiation, integration.
3) Using maxima software for plot functions and data in two and three dimensions.

Semester – II

Theory Courses

MTC-121: Linear Algebra

1) Analyze and use linear, exponential, and quadratic models to answer questions about the situations they represent. In particular, relate graphical features (like the x- and y-intercepts and the vertex of a parabola) to specific aspects of the situation being modeled. For quadratics, be able to rewrite the function appropriately in order to find the information desired.
2) Construct algebraic models to describe real-life situations.
3) Solve linear, quadratic, exponential, logarithmic and square root equations. This includes solving quadratic equations using the zero-product property, completing the square, and the quadratic formula.

MTC-122: Graph Theory

1) Solve problems using basic graph theory. Identify induced sub graphs, cliques, matchings, covers in graphs.
2) Determine whether graphs are Hamiltonian and/or Eulerian and Solve problems involving vertex and edge connectivity, planarity and crossing numbers.
3) Solve problems involving vertex and edge coloring and Model real world problems using

graph theory.

Practical Courses

MTC 123: Mathematics Practical

1) Students gets sufficient knowledge of fundamental principles, methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.
2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science and technology.
3) Enhancing students' overall development and to equip them with mathematical modeling abilities, problem solving skills , creative talent and power of communication necessary for various kinds of employment .
4) Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.

SYBCS

Semester-I

Theory Courses

CSST 111 :Descriptive Statistics

1) 1Students getting knowledge of mean,median,mode,range,varience and standard deviation.
2) Use discrete and continuous probability distributions, including requirements, mean and variance, and making decisions.
3) Define binomial outcomes and compute probability of getting X successes in N trials.
4) Identify the characteristics of different discrete and continuous distributions.
5) Identify the type of statistical situation to which different distributions can be applied

CSST 112 :Mathematical Statistics

1) Use Poisson, exponential distributions to solve statistical problems.
2) Use the normal probability distribution including standard normal curve calculations of appropriate areas.
3) Use different distributions to solve simple practical problems.
4) Analyze Statistical data using MS-Excel.

Practical Courses

CSST113: Statistics Practical

1) To tabulate and make frequency distribution of the given data.

2) To use various graphical and diagrammatic techniques and interpret.
3) To compute various measures of central tendency, dispersion, Skewness and kurtosis.
4) To fit the Binomial and Poisson distributions. To compute the measures of attributes.
5) The process of collection of data, its condensation and representation for real life data.

Semester-II

Theory Courses

CSST 121 :Methods of Applied Statistics

1) Students will demonstrate their ability to apply statistics in other fields at an appropriate level and demonstrate their ability to apply knowledge acquired from their major to real world models.
2) Students will demonstrate mastery of data analysis and statistical concepts by communicating critically reasoned analysis through written and oral presentations.
3) Students will acquire up-to-date skills and/or applications of computer and statistical programming related to future career choices.
4) Students will apply their knowledge of statistics through an in-depth senior project/research experience. Results will be presented in both written (paper, publication, portfolio, etc.) and visual (PowerPoint, poster, portfolio, etc.) formats.
5) Students will be able to read, interpret, and critically analyze journal articles directed at undergraduate students.

CSST122: Continuous Probability Distributions and Testing of Hypotheses

1) Use a probability distribution for a continuous random variable to estimate probabilities and identify unusual events.
2) One continuous distribution often used in financial models is the uniform distribution, in which each possible outcome has the same probability of occurrence as any other outcome; hence, there is no clustering of values.

Practical Course

CSST 123: Statistics Practical

1) To understand the relationship between two variables using scatter plot.
2) To compute coefficient of correlation, coefficient of regression.
3) To fit various regression models and to find best fit.
4) To fit the Normal distribution. To understand the trend in time series and how to remove it

Theory Courses

CS 211- DATA STRUCTURES USING 'C'

1) To learn the systematic way of solving problem
2) To understand the different methods of organizing large amount of data
3) To efficiently implement the different data structures
4) To efficiently implement solutions for specific problems

CS-212-Relational Database Management System

1) To teach fundamental concepts of RDBMS (PL/PgSQL)
2) To teach principles of databases
3) To teach database management operations
4) To teach data security and its importance
5) To teach client server architecture

Semester-II

Theory Courses

Semester II CS 221 -Object Oriented Concepts using C++

1) Acquire an understanding of basic object oriented concepts and the issues involved in effective class design
2) Write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc.

CS - 222: Software Engineering

1) To teach basics of System Analysis and Design.
2) .To teach principles of Software Engineering
3) To teach various process models used in practice
4) To know about the system engineering and requirement engineering and to build analysis model

Practical Course

CS-223 : Data structures Practicals and C++ Practicals

1) Design and implement Data structures and related algorithms

2) Understand several ways of solving the same problem.

CS-224:Database Practicals& Mini Project using Software Engineering techniques

1) Understanding the use of cursors, triggers, views and stored procedures
2) Understanding the steps of system analysis and design
3) Understanding Data requirements for a specific problem domain
4) Designing Data base as per the Data requirements

Semester –I

Theory Courses

MTC - 211 : Applied Algebra

1) A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies.
2) A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.

MTC - 212 : Numerical Analysis

1) A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.
2) A student be able to apply their skills and knowledge ,that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.

Semester –II

Theory Courses

(MTC : 221) : Computational Geometry

1) Constructs algorithms for simple geometrical problems.
2) Implement computational geometry algorithms
3) Guide students to develop their own algorithms for solving geometric problems.
4) Make able students to implement the algorithms .

(MTC:222) : Operations Research

1) Know principles of construction of mathematical models of conflicting situations and mathematical analysis methods of operations research.
2) Be able to choose rational options in practical decision-making problems using standard mathematical models of operations research.
3) Have skills in analysis of operations research objectives, mathematical methods and computer systems.

Semester –II

Practical Courses

MTC -223 Practical

1) Understand the need for simulation/implementation for the verification of mathematical functions.
2) Understand the main features of the SCILAB program development environment to enable their usage in the higher learning.
3) Implement simple mathematical functions/equations in numerical computing environment such as SCILAB.
4) Interpret and visualize simple mathematical functions and operations thereon using plots/display.
5) Analyze the program for correctness and determine/estimate/predict the output and verify it under simulation environment using SCILAB tools.

Semester-I

Theory Courses

(ELC 211): Digital System Hardware

1) Develop and getting knowledge about the applications of logic gates.
2) Make use of K-maps for digital circuit design in life. Study and understand basics of microprocessors
3) Understand fundamentals of multicore technology.

(ELC 212) : Analog Systems

1) To understand basics of analog electronics
2) To study different types of sensors
3) To understand different types of signal conditioning circuits

4) To learn data conversion techniques.To apply knowledge of analog systems in different applications

Semester – II

Theory Courses

(ELC 221) :The 8051 Architecture, Interfacing & Programming

1) Understand basics of analog electronics. Study different types of sensors
2) Understand different types of signal conditioning circuits
3) Learn data conversion techniques. Developing knowledge of analog systems in different applications

(ELC 222) Communication Principles

1) To understand basics of communication systems.
2) To understand modulation, demodulation and multiplexing of signals.
3) To understand digital communication techniques
4) To introduce concepts in advanced wireless communication.

Practical Courses

Paper- III: Practical Course (ELC-203)

1) To use basic concepts for building various applications in electronics.
2) To understand design procedures of different electronic circuits as per requirement.
3) To build experimental setup and test the circuits.
4) To develop skills of analyzing test results of given experiments

TYBCS

Semester III

Theory Course

CS-331 Systems Programming

1) To understand the design and implementation issues of System programs that play an important role in program development.
2) To understand the design structure of a simple editor.
3) To understand the design structure of Assembler and macro processor for an hypothetical simulated computer.
4) To understand the working of linkers and loaders and other development utilities.

5) To understand Complexity of Operating system as a software.

CS-332 Theoretical Computer Science

1) To have a introductory knowledge of automata, formal language theory and computability.
2) To have an understanding of finite state and pushdown automata.
3) To have a knowledge of regular languages and context free languages.
4) To know the relation between regular language, context free language and corresponding recognizers. 5. To study the Turing machine and classes of problems.

CS-333 : Computer Networks -I

1) This course will prepare students in Basic networking concepts.
2) Understand different types of networks, various topologies and application of networks.
3) Understand types of addresses, data communication.
4) Understand the concept of networking models, protocols, functionality of each layer.
5) Learn basic networking hardware and tools.

CS-334 : Internet Programming I

1) To Design dynamic and interactive Web pages.
2) Learn Core-PHP, Server Side Scripting Language.
3) Learn PHP-Database handling. Prerequisite

CS-335: Programming in Java-I

1) To learn Object Oriented Programming language
2) To handle abnormal termination of a program using exception handling
3) To create flat files
4) To design User Interface using Swing and AWT

CS-336 : Object Oriented Software Engineering

1) To Understand Object Oriented Modeling techniques and their applicability.
2) Understanding importance of Object Orientation in Software engineering
3) Understand the components of Unified Modeling Language
4) Understand techniques and diagrams related to structural modeling and behavioral modeling
5) Understand techniques of Object Oriented analysis, design and testing

Semester IV

Theory Course

CS-341 :Operating System.

1) To understand design issues related to process management and various related algorithms
2) To understand design issues related to memory management and various related algorithms
3) To understand design issues related to File management and various related algorithms

CS-342 : Compiler Construction

1) To understand the various phases of a compiler and to develop skills in designing a compiler
2) To understand design issues of a lexical analyzer and use of Lex tool
3) To understand design issues of a parser and use of Yacc tool
4) understand issues related to memory allocation
5) To understand and design code generation schemes

CS-343 : Computer Networks -II

1) Basic networking concepts.
2) Understand wired and wireless networks, its types, functionality of layer.
3) Understand importance of network security and cryptography.

CS-344 : Internet Programming II

1) To Design dynamic and interactive Web pages.
2) Learn different technologies used at client Side Scripting Language
3) Learn XML,CSS and XML parsers.
4) One PHP framework for effective design of web application. Learn JavaScript to program the behavior of web pages.
5) Learn AJAX to make our application more dynamic.

CS-345 :Programming in Java-II

1) To learn database programming using Java
2) To study web development concept using Servlet and JSP
3) To develop a game application using multithreading
4) To learn socket programming concept

CS-346 : Computer Graphics

1) Computer programming skills in C programming language
2) Basic understanding of use of data structures
3) Basic Mathematical concepts related to matrices and geometry

Practical Course

CS-347 : System Programming & Operating System

1) Understand the process of designing and implementing System programs and operating system components.
2) Design and implement System programs with minimal features to understand their complexity.
3) Design and implement simulations of operating system level procedures.

CS 348:Lab Course II – Programming in Java

1) To develop understanding the process of designing and implementing Core and Advanced Java programs.
2) Implement core Java programs to solve simple problems .Implement Client and Server end Java programs

CS-349 : Lab Course III – Programming in PHP & Project

1) Understand the process of designing and implementing Web applications, using PHP.
2) Implement Simple PHP programs to solve simple problems.

M.SC.

CHEMISTRY

M. Sc. Part- I

Semester- I

Theory Courses:

Course: 1) CHP: 110 Fundamentals of Physical Chemistry P-I

The learner will be acquired with sound knowledge of -

1) Thermodynamics- Heat, work & Conservation of energy – The basic concepts, the first law in finitesimal changes, mechanical work, work of compression & expansion, free expansion, expansion against constant pressure, reversible expansion. Heat:- heat capacity, enthalpy. State functions & differentials – State functions, exact & inexact differential, changes in internal

energy, temperature dependence of the internal energy, temperature dependence of the enthalpy. Work of adiabatic expansion – Irreversible adiabatic expansion, reversible adiabatic expansion.

2) The second law of Thermodynamics: Measuring the dispersal the entropy. The second law, definition of entropy, the entropy changes in the system, natural events. Entropy change in the universe – The enthalpy change when a system is heated. Entropy changes in surroundings.
3) Combining First & Second law – One way of developing the fundamental equations properties of Gibbs function. The temperature dependence of the Gibbs functions. The pressure dependence of the Gibbs functions. The chemical potential of a perfect gas. The open system & changes of composition.
4) Changes of State: Physical Transformation of pure materials. The stabilities of phases, Phase equilibrium & phase diagrams. The solid – liquid boundary. The liquid - vapor boundary. The solid-liquid-vapor boundary.
5) Quantum theory, failure of classical mechanics, black body radiation, photo electric effect, specific heats of solids, Atomic spectra, wave particle duality, uncertainty principles, Schrodinger equation.
6) The rates of reaction, reaction rate, rate laws & rate constants, the determination of the rate law, first order, second order reactions, half lives, fractional order reactions.
7) Accounting for rate laws, simple reactions, the temperature dependence of reaction rates, reactions approaching equilibrium, consecutive reactions, the steady state approximations, pre equilibria, unimolecular reactions.
8) The kinetics of complex reactions: chain reaction- explosion, photochemical reactions Quantum efficiency, fast reactions-flash photolysis, flow techniques, relaxation methods.
9) Molecular reaction dynamics- collision theory-the basic calculations, the steric requirements, Diffusion control reactions- classes of reactions, diffusion and reactions, the details of diffusion, Activated complex theory- the reaction coordinate and the transition state, the formation and decay of the activated complex, how to use the Eyring equation, thermodynamics aspects, reactions between ions.
10) Enzyme catalysts: Michaelis-Menten mechanism, limiting rate, Lineweaver Burk and Eadie plots enzyme inhibition.
11) Molecular Thermodynamics: Molecular energy levels, Boltzmann distribution law, partition functions and ensembles, translational, rotational and vibrational partition functionns of diatomic molecules, Obtaining energy, heat capacity, entropy free energy, equilibrium constant.

Course: 2) CHI-130: Molecular Symmetry & Chemistry of p-block elements

The learner will be acquired with sound knowledge of –

1) Defining properties of a group, group multiplication table, some examples of group, Sub groups, classes
2) Molecular Symmetry and Symmetry Groups: **S**ymmetry elements and operations, Symmetry planes and reflections, the inversion centre, proper axes and proper rotations, improper axes and improper rotation, products of symmetry operations, equivalent symmetry elements.
3) Representations of Groups: Matrix representation and matrix notation for geometric transformation, The Great Orthogonality Theorem.
4) Group theory and quantum mechanics:Wave function as basis for irreducible representations.
5) Symmetry Adapted Linear Combinations: Projection operators and their use of construct SALC (Construction of SALC for sigma bonding for molecules belonging point groups: D2h, D3h, D4h, C4v, Td., Oh., normalization of SALC.
6) Molecular Orbital Theory, Application of Group theory to Infrared Spectroscopy.
7) Hydrogen and its compounds: Hydrides: Classification, electron deficient, electron precise and electron rich hydrides. PH3 , SbH3 , AsH3 , Selenides, Tellurides, Alkali and alkaline earth metals: Solutions in non-aqueous Media, Application of crown ethers in extraction of alkali and alkaline earth metals.
8) Organometallic Compounds, Boron group, Carbon group, Nitrogen, Oxygen, Halogen groups.

Course: 3) CHO-150: Basic organic chemistry

The learner will be acquired with sound knowledge of –

1) Structure and reactivity, Bonding other than covalent bonding, Acidity and basicity, Aromaticity, Structure and stability of reactive intermediates, carbenes, nitrenes, carbocations carbanions and free radicals.
2) Sterochemical principles, enantiomeric relationship, distereomeric relationship, R and S, E and Z nomenclature in C, N, S, P containing compounds, Prochiral relationship, stereospecific and stereoselective reactions, optical activity in biphenyls, spiranes, allenes and helical structures.
3) Aliphatic nucleophilic substitution-SN1, SN2, SET and SNV mechanism, NGP by pi and sigma bonds, classical and non-classical carbocations, phenonium ions, norbornyl system, carbocation rearrangement in NGP, SNi mechanism, nucleophilic substitution in allylic, Trigonal and vinylic carbon, effect of structure, nucleophile, leaving group.
4) Aromatic Electrophilic substitution- Arenium ion mechanism, orientation and reactivity, energy profile diagram, ortho, para, ipso attack, orientation in other ring systems, naphthalene, anthracene, six and five membered heterocycles, diazonium coupling. Important reactions like Friedel crafts alkylation and acylation, Nitration, halogenation, formylation, Chloromethylation, sulponation.

5) SNAr, SN1, Benzyne and SNR1 reactions, reactivity: effect of substrate structure, leaving group and attacking nucleophile.
6) Addition to C-C multiple bonds - mechanism and stereochemical aspects of addition reaction involving electrophile, nucleophile and free radicals, Regio and chemo selectivity, orientation and reactivity, conjugate addition.
7) E1, E2, E1cb mechanisms, orientation and stereochemistry in elimination reaction, reactivity effect of structure, attacking and leaving group, competition between elimination and substitution, syn eliminations.

Course: 4) CHA-190: Safety in Chemical Laboratory and Good Laboratory Practices

The learner will be acquired with sound knowledge of –

1) Importance of safety and health in Laboratory, Different types of Hazards at workplace handling chemicals, Personal Protective and other safety equipments and their uses
2) Do's and don'ts: Safe clothing, hair, dangling jewellery responsible attitude, good House Keeping, use proper PPE, No food in Labs.
3) First Aid- For contact of different chemicals on skin, eyes, and inhalation and ingestion.
4) Types of fire extinguishers, method of use.
5) Material Safety Data Sheets, Globally Harmonised System (GHS) Signs.
6) Inventory Management, Storage and Disposal.
7) OSHA laboratory Standards.
8) Good Laboratory Practices (GLP).

Semester- II

Theory Courses:

Course: 1) CHP: 210 Fundamentals of Physical Chemistry P-I

The learner will be acquired with sound knowledge of –

1) Molecular Spectroscopy- Microwave Spectroscopy, Infra red spectroscopy : Harmonic and an harmonic oscillator, vibrational spectra of di – and poly- atomic molecules, coarse and fine structure, Nuclear spin effect, applications.
2) Raman Spectroscopy: Introduction, Rotational Raman- spectra, Vibrational Raman, Spectra, polarization of light and Raman effect, structure elucidation from combined Raman and IR spectroscopy, applications in structure elucidation.
3) Electronic spectroscopy of molecules: Born – Oppenheimer approximation, electronic spectra of

diatomic molecules, vibration, al coarse structure, rotational fine structure dissociation energy and dissociation products, electronic structure of diatomic molecules, molecular photoelectron spectroscopy, and application.

4) ESR and Mossbauer spectroscopy applications, Principles of NMR – Chemical applications of PMR in structure elucidation.
5) Type of radioactive decay, Decay Kinetics, Detection & measurement of radiation (G.M. & Scintillation counter)
6) Elements of radiation chemistry – Radiation chemistry, interaction of radiation with miller, passage of nucleolus through matter, interaction of radiation with matter.
7) Nuclear Reactor: - The fission energy, The Natural uranium reactor, the four factor formula- The reproduction factor K, the classification of reactor. Reactor power.
8) Isotopes for nuclear reactors, Isotope separation, Applications of radioactivity.

Course: 2) CHI-230: Coordination and Bioinorganic Chemistry

The learner will be acquired with sound knowledge of –

1) Ligand Field Theory of Coordination Complexes-Russell- Saunders terms
2) Electronic spectra of Transition Metal Complexes-Band intensities, band energies
3) Magnetic Properties of Coordination Complexes-types of magnetism, Curie law etc.
4) Principles of Coordination Chemistry related to Bioinorganic Research and Protein, Nucleic acids and other metal binding biomolecules, Biochemistry of Na, K and Ca w.r.t. Na/K pumps, Calmodulin and blood coagulation, Biochemistry of following elements:

   (a) Iron: Ferritin, Transferrin, Fe-S clusters, Porphyrin based systems

   (b) Manganese: Photosynthesis.

Course: 3) CHO-250: Synthetic organic chemistry and spectroscopy

The learner will be acquired with sound knowledge of –

1) Oxidation reactions ofCrO3, PDC, PCC, KMnO4, MnO2, Swern, SeO2, Pb(OAc)4, Pd-C, OsO4, m-CPBA, O3, NaIO4, HIO4
2) Reduction reactions of Boranes and hydroboration reactions,MPV reduction and reduction with H2/Pd-C, Willkinsons catalyst, DIBAL and Wolff Kishner reduction.
3) Rearrangements of Beckmann, Hofmann,, Curtius, Smith, Wolff, Lossen, Bayer-villiger, Sommelet, Favorskii, Pinacol-pinacolone, Benzil-benzilic acid.
4) Ylides- reactions of Phosphorus, Nitrogen and Sulphur ylides.
5) UV: Factors affecting UV absorption and interpretation of UV spectra
6) IR: Basic ideas about IR frequencies, interpretation of IR spectra

7) PMR: Fundamentals of PMR, factors affecting chemical shift, integration coupling (1st order analysis)
8) CMR and mass spectrometry.

Course: 4) CHA-290: General Chemistry – II

PART- C: Concept of Analytical Chemistry

The learner will be acquired with sound knowledge of –

1) Data Handing and Spreadsheets in Analytical Chemistry -Accuracy and Precision, classification of errors, Significant figures, rounding of Sampling, Standardization and Calibration - Analytical Samples and Methods of Sampling, Sample Handling, Gross sample, Preparation of Laboratory samples.
2) Introduction to analytical separations - Separation by precipitation, separation of species by distillation, separation by extraction, separation by ion exchange chromatography.

PART- D: Industrial Methods of Analysis (2 Credits)

The learner will be acquired with sound knowledge of –

1) Concentration of solution based on volume and mass unit, calculations of ppm , ppb and dilution of the solutions , Concept of mmole, Stoichiometry of chemical reactions, Concept of gmole, Limiting reactants.
2) Quality systems in chemical laboratories, cost and benefits of quality system, types quality standards for laboratories, total quality management, quality audits, and qualities reviews, responsibility of laboratory staff for quality.
3) Industrial process analyzer, methods based on bulk properties, continuous online process control, automatic chemical analyzers, automatic elemental analyzers.

Semester – I & II

Practical Courses-

Course 1) CHP-107: Physical Chemistry Practical

The learner will be acquired with sound knowledge of –

1) Principles of Chemical kinetics, Viscosity, Adsorption, Colorimetry, Refractometry, pH metry, Potentiometry, Conductometry etc.
2) Handling of above instruments.
3) Data analysis & drawing of graph.
4) Preparation of stock solutions, Normal, Molar solutions.

5) Standardization of instruments.

Course 2) CHI-127: Inorganic Chemistry Practical

The learner will be acquired with sound knowledge of –

1) Analysis of ore & alloy by gravimetric & Volumetrically
2) Synthesis & purity determination of Inorganic compounds.
3) Synthesis of Nanomaterial by using Muffle furnance.
4) Standardization & use of Conductometer.
5) Preparation of stock solutions, Normal, Molar solutions.

Course 3) CHO-247: Organic Chemistry Practical

The learner will be acquired with sound knowledge of –

1) Purification of solvents and reagents using techniques like crystallization, distillation, steam distillation, vacuum distillation, drying and storage of solvents, sublimation etc.
2) Three component separation using ether.
3) Single stage preparation of some organic compounds by using micro scale technique.
4) Monitoring reactions using TLC.

M. Sc. Part- II
Semester- III

Theory Courses:

Course: 1) CHO: 350 Organic Reactions Mechanisms

The learner will be acquired with sound knowledge of -

1) Formation & Stability of Carbanions.
2) Formation & Applications of Enamines.
3) Reactions of Carbenes & Nitrenes.
4) Free Radical Reactions.
5) Mechanisms in Biological Chemistry.
6) Neighboring group participation in Organic Reactions.

Course: 2) CHO: 351 Spectroscopic Methods in Structure Determination

The learner will be acquired with sound knowledge of-

1) ^{1}H NMR Spectroscopy.
2) ^{13}C NMR Spectroscopy.

3) COSY, TOCSY, NOESY, HETERO COSY etc. techniques.
4) Mass Spectrometry.

Course: 3) CHO: 352 Organic Stereochemistry

The learner will be acquired with sound knowledge of-

1) Stereochemistry of Six membered rings.
2) Stereochemistry of rings other than Six membered rings.
3) Fused, Bridged & Caged rings.
4) Resolution of Racemic Modification.
5) Geometrical isomerism & Stereochemistry of Olefins.

Course: 4) CHO: 353 Photochemistry, Pericyclic reactions & Heterocyclic Chemistry.

The learner will be acquired with sound knowledge of-

1) Photochemistry of Carbonyl compounds, Alkenes, Dienes, Polyenes & Aromatic Compounds.
2) Applications of Photochemical reactions in synthesis.
3) Electrocyclic, Cycloaddition, Sigmatropic & Ene Reactions.
4) Heterocyclic Chemistry

Semester- IV

Theory Courses:

Course: 1) CHO: 450 Chemistry of Natural Products

The learner will be acquired with sound knowledge of -

1) Synthesis & Stereochemistry of Hardwickiic acid, Camptothecin & Podophyllotoxin.
2) Retro & Synthesis of Taxol, Javabione, Fredericamycine- A, Estrone & Miferitsone.
3) Metabolic pathways of Shikimic acid, Terpenoid, Stereoids, Alkaloids etc.

Course: 2) CHO: 451 Advanced Synthetic Organic Chemistry

The learner will be acquired with sound knowledge of -

1) Transition metal complexes in organic synthesis ; only Pd, Ni, Co, Fe
2) C-X bond formation reactions: Suzuki, Heck, Sonogashira, Stille, Fukuyama, Kumada, Hiyama, Negishi, Buchwald-Hartwig, Noyori, Reppe, Oxo process.

3) C=C formation reactions: Wittig, Horner-Wordworth-Emmons, Shapiro, Bamford Stevens, McMurry, Julia-Lythgoe and Peterson olefination reactions, Titanium-carbene mediateo olefination: Tebbe, Petasis and Nysted reagent.
4) Multi-component reactions: Ugi, Passerini, Biginelli and Mannich reactions.
5) Ring formation reactions: Pausan-Khand, Bergman and Nazerov cyclization.
6) Click chemistry: criterion for click reaction, Sharpless azides cycloadditions.
7) Use of Boron and Silicon in organic synthesis.

Course: 3) CHO: 452 Carbohydrate and Chiron approach, Chiral Drugs and Medicinal Chemistry

The learner will be acquired with sound knowledge of -

1) Carbohydrates- Introduction of sugars, structures of triose, tetrose, pentose, hexose, stereochemistry and reactions of Glucose, conformation and anomeric effects in hexoses.
2) Chiron approach- Introduction,The concept of chiral templates and chirons wherein the carbon skeleton is the chiral precursor.
3) Utilisation of the basic concepts for retrosynthetic strategy and synthesis of the following – (S) Propanediol, (R) and (S) – Epichlorohydrin, L (+)-Alanine, (-) Multistratin, (-) Pentenomycin, (-) Shikimic acid
4) Chiral Drugs- Introduction of chiral drugs, Eutomer, Distomer and eudesmic ratio, Distomers- with no side effects b) with undesirable side effects Synthesis and pharmacological activity of S-Ibuprofen, S-Metaprolol
5) Medicinal Chemistry- Introduction, Reactivity, Drug targets, Antimicrobial drugs etc.

Course: 4) CHO: 453 Designing Organic Synthesis and Asymmetric Synthesis

The learner will be acquired with sound knowledge of -

1) Designing of organic synthesis: Protection and de-protection of hydroxyl, amino, carboxyl, ketone and aldehyde functions as illustrated in the synthesis of polypeptide and polynucleotide, enamines, Umpolung in organic synthesis, Retrosynthesis.
2) Principles and applications of asymmetric synthesis- stereoselectivity in cyclic compounds, enantio-selectivity, diastereo-selectivity, enatiomeric and diastereomeric excess, stereoselective aldol reactions. Cram's rule, Felkin Anh rule, Cram's chelate model, Asymmetric synthesis, use of chiral auxiliaries, chiral reagents and catalysts, asymmetric hydrogenation, asymmetric epoxidation and asymmetric dihydroxylation.

Semester- III & IV

Practical Courses:

CHO-347: Single stage preparations

The learner will be acquired with sound knowledge of -

1) Micro scale technique for Synthesis of compounds by different methods like oxidation, reduction addition reactions.
2) Different Practical Conditions like reaction time, temperature, pressure etc.
3) Study of name reactions like benzil- benzilic acid rearrangement, Nitration, Pechmann Condensation, Fischer indole synthesis, Cannizzaro reaction etc.
4) Use of Magnetic stirrer, Suction pump, Digital Melting point apparatus, Alumina foil & UV chamber for TLC technique etc.

CHO-447 : Two stage preparations

The learner will be acquired with sound knowledge of -

1) Multi stage preparation of different reactions.
2) Monitor the reaction by TLC.
3) Study of intermediate product & second stage product with different practical conditions.
4) Practical gives knowledge of reactions & its mechanism.

CHO-448: Project/Industrial training/Green Chemistry and Chemical biology experiments

The learner will be acquired with sound knowledge of -

1) Approach of Green Chemistry.
2) Use of non toxic chemical for reactions.
3) Study of Solvent free reaction.
4) Use of Motor & Pistil for reaction.
5) Industrial training gives a basic knowledge of how large scale reactions are done at industry/ Company level.