College of Arts, Science & Commerce (Autonomous)

SIES

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

LIST OF OPEN ELECTIVES OFFERED TO FYBCOM STUDENTS UNDER NEP 2020 w.e.f Academic Year 2023-24

Sr. No	Open Elective Paper Name	Semester	Department
1	Landscaping and Urban Gardening	I	Botany
	Food Processing Technology	II	
2	Chemistry in Everyday Life – I	I	Chemistry
	Chemistry in Everyday Life – II	II	
3	Logical Reasoning and Mental ability	I	Physics
	Basic Astronomy	II	
4	Understanding History of Mumbai	I	History
	An Overview of Cultural Aspects of Maharashtra	II	
5	Business Mathematics and Statistics I	I	Mathematics
	Business Mathematics and Statistics II	II	

AC / 27.06.2023 / RS (1)

College of Arts,
Science &
Commerce (Autonomous)

SIES

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

DEPARTMENT OF BOTANY

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course offered to: FYBA(OE), FYBCOM (OE)

Offered By: Department of Botany

**Choice Based Credit System (CBCS) Syllabus Under NEP, 2020
Approved By Board of Studies in Botany for the
Academic Year 2023 – 24**

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

Page **1** of **6**

OE: BOTANY FYBA & FYBCOM SEMESTER – I (Credits: 4)				
Landscaping and Urban Gardening (2 Theory + 2 Tutorials)				
Paper Code	Unit No.	Unit Name	Credits	Lectures/week
SIUBOOE111	1	Landscaping	02	01+01
	2	Urban Gardening	02	01+01

Course description: Landscaping and urban gardening have become the need of the hour to reduce the carbon footprints and to provide a clean green climate along with the food and financial security to the urban dwellers. Landscaping refers to the art and craft of growing plants to create beauty within the landscape. Urban gardening refers to the cultivation of vegetables, fruits, medicinal and ornamental plants in backyards, balconies, windows, or at rooftops within the urban city limits. The course landscaping and urban gardening would introduce the learners to the scope, role and styles of urban gardening like kitchen gardening, vertical walls, Miyawaki gardening, Nursery management and so on. It would enable the learners to understand the principles of landscaping and appreciate the beauty of classical styles of landscape designing such as English, Japanese, French and Spanish styles of landscaping. Designing professional landscapes using architectural software through computer applications would be the key element of this course. Completion of the course would help the learner to develop required skills for designing landscapes, vertical walls, nurseries, urban gardens and would also encourage them to have their own start-ups or consultancies in the same field.

OE: BOTANY FYBA & FYBCOM SEMESTER – II (Credits: 4)				
Food Processing Technology (2 Theory + 2 Tutorials)				
Paper Code	Unit No.	Unit Name	Credits	Lectures/week
SIUBOOE121	1	Postharvest Processing and Preservation Technology	02	01+01
	2	Beverage Processing and Preservation Technology	02	01+01

Course Description: Food processing is the important branch of the commercial food industry as it processes the raw fruits, vegetables and flowers to eliminate disease causing micro-organisms and to extend the shelf life of food products. The course Food Processing Technology would help the learners to understand the objectives, scope, and importance of post-harvest preservation technology. It would introduce the learners to various processing and preservation techniques. The course would give them demonstration-based training for processing the fruits and vegetables into jams, jellies, pickles, squash, syrups, fruit leather and so on. The learners would be able to understand the aspects of beverage technology and the basics of natural and alcoholic beverage production along with their health benefits. Completion of the course would help the learner to develop required skills for processing and preserving the fruits and vegetables using different techniques and would also encourage them to have their own small scale start-ups in the same field.

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

Page **2** of **6**

Semester I	Hr.	Cr.
Paper I - Landscaping and Urban Gardening	**60**	**4**
Learning Objectives: The open elective course 'Landscaping and Urban Gardening' in Semester I includes the theory and tutorial-based units on landscaping and urban gardening. It would make the learners understand the overall concept, principles, and scope of outdoor and indoor landscaping. It would develop interest among learners by highlighting the current trends in designing and styling the landscapes and urban gardens. The course aims to introduce the learners to the scope, role, and styles of kitchen gardening, vertical walls, Miyawaki gardening, Nursery management and so on.		
Course Outcomes: After completion of the course, learners would be able to: **CO1**: Enjoy the beauty of landscapes, urban gardens, topiary gardens, and the plants suitable through field-based studies. **CO2**: Expertise in designing and styling various types of landscapes, urban gardens, and nurseries. **CO3**: Apply architectural software for designing professional plantscapes. **CO4**: Develop required skills to have their own start-ups or consultancies in designing landscapes, vertical walls, topiaries, nurseries, urban gardens. **CO6**: Get hands-on training for styles of indoor gardening and create their own Bottle-garden, Dish-garden, Bonsai, Hanging Basket, Kokedama.		
UNIT I – Landscaping	**30**	**2**
Theory	**15**	**1**
1 **Landscape gardening:** Definition, objective, principles, procedure, scope, and applications. (3L)		
2 **Styles of landscape designing:** Regular, Naturalistic, Classical styles - English, Japanese, French and Spanish. (6L)		
3 **Topiaries & Tree Shaping:** Definition, Objectives, Importance, Procedure, Plants suitable. (3L)		
4 **Plantscaping:** Definition, concept, benefits, key elements, and types – Softscaping, Stonescaping, Waterscaping, Living Green Walls, Floating indoor landscaping, Holyscaping, Microfarming. (3L)		
Tutorials	**15**	**1**
1 **Landscape Garden plans:** Formal, Informal, Private and Public. (2L)		
2 **Garden Locations in landscaping and plants suitable:** Avenue, Path, Hedge, Edge, Arches and Pergolas, Flower bed, Lawn, water garden and rock garden. (4L)		
3 Computer applications in landscaping (4L)		
4 **Topiary Gardens:** Kamala Nehru Park, Mumbai, Miracle Garden, Dubai, Durbuy Topiary Park, Belgium, Leven's Hall Manor's Garden, England, Columbus Topiary Park, Ohio, USA. (5L)		

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

Page **3** of **6**

UNIT II – Urban Gardening	30	2
Theory	15	1
1	**Introduction to Gardening:** Definition, objectives, and scope; role of gardens in horticulture industry. (3L)		
2	**Urban Gardening**: Definition, significance. Styles of urban gardening and plants suitable - Window gardening, Kitchen gardening, and Miyawaki Gardening. (5L)		
3	**Urban Nursery Development and Management:** Definition, objectives and scope, Types of nurseries, infrastructure for nursery, capital investments, planning and execution, plant propagation, packaging, sale, exhibition, branding, marketing, transportation, expenditure, and profit analysis. (7L)		
Tutorials	15	1
1	**Gardening implements and operations:** Types of gardens implements and their applications, Gardening operations - Potting, repotting, irrigation, mulching, composting, fertigation, weeding, pruning, pest, and disease control. (2L)		
2	**Propagation of Garden Plants:** Sexual and Asexual Propagation methods; Seed Production and Seed Propagation, Vegetative Propagation, Cutting, Budding, Layering and Grafting in Horticultural Plants. (6L)		
3	**Urban Indoor Gardening:** Bottle-garden, Dish-garden, Bonsai, Hanging Basket, Kokedama (3L)		
4	**Small- scale nursery development, management, and economics:** Setting up nursery at college level and its management through plant sell and exhibitions. (4L)		

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

Page **4** of **6**

Semester II	Hr.	Cr.
Paper I – Food Processing Technology	60	4
Learning Objectives: The open elective course 'Food Processing Technology' in Semester II includes the theory and tutorial-based units on post-harvest processing and preservation technology as well as beverage processing and preservation technology. It would introduce the learners to the world of post-harvest handling, processing and preservation techniques and the governmental schemes available for the same. It would develop interest among learners by highlighting the processing and health benefits of alcoholic, non-alcoholic and probiotic beverages.		
Course Outcomes: After completion of the course, learners would be able to: **CO1**: Study and comment upon the objective, scope and importance of post-harvest and beverage processing and preservation technologies. **CO2**: Learn the various post-harvest handling and processing techniques for fruits, vegetables, and flowers for their better shelf-life. **CO3**: Study and describe Indian Government Schemes available for effective Postharvest management of horticultural crops. **CO4**: Develop required skills to have their own start-ups by processing fruits and vegetables into jam, jelly, squash, syrup, pickles, mix-herb powders. **CO5:** Classify and differentiate amongst the alcoholic, non-alcoholic and probiotic beverages along with special reference to their botanical sources, processing techniques and health benefits.		
UNIT I – Post-Harvest Processing and Preservation Technology	30	21
Theory	15	1
1 **Introduction to post-harvest technology:** Concept, Objectives, Scope, and importance of post-harvest technology in horticultural industry. (3L)		
2 **Post-harvest losses:** Causes for post-harvest losses (Primary, Secondary), Factors affecting postharvest losses. (2L)		
3 **Post-harvest handling operations:** Overview of post-harvest handling, Post harvest handling of fruits, vegetables, grains, cut flowers, herbs; Pre-treatment before transport (chlorination, trimming, dressing, waxing, chemical treatment); Packaging and transport of produce; types of storage. (7L)		
4 **Indian Governmental Schemes for Postharvest management:** Rastriya Krishi Vikas Yojana, Pradhan Mantri Kisan Sampada Yojana, Integrated Scheme for Agricultural Marketing (3L)		
Tutorials	15	
1 **Post harvest processing and preservation techniques:** Drying (Sun-drying, Hot air drying, Vacuum drying, Osmotic drying), freezing (Cold air blast freezing, Plate Freezing, Cryogenic Freezing, Dehydro-freezing, Freeze-drying), Irradiation. (6L)		
2 **Canning** of fruits and vegetables (1L)		

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

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3	**Processing and preservation of fruits using sugar concentrates:** Definition, Principle and preparation of Jam, jelly, fruit candies, and fruit leather. (4L)		
4	**Processing and preservation of vegetables using salt concentrates:** Definition, Principle of Pickling, Types and preparation of Pickles (Brine, Vinegar, Indian pickles). Preparation of mix herb powder, vegetable powder, vegetable chips. (4L)		
UNIT II – Beverage Processing and Preservation Technology		**30**	**2**
Theory		**15**	**1**
1	**Beverages:** Definition, classification/types, nutritional values, and health benefits. Role of Fermentation technology in the Indian Beverage Industry (3L)		
2	**Non-alcoholic beverages**: Botanical sources, processing and health benefits of Tea, coffee, cocoa, neera, coconut water, kokum juice/sharbat. (3L)		
3	**Alcoholic beverages**: Botanical sources, and health benefits of Fermented beverage (Wines, Cider, Perry), Brewed and fermented beverages (Beer and Sake), Distilled beverages (Spirits, Liquors and Bitters). (6L)		
4	**Preservation of Beverages:** Objectives and principles of beverage preservation, Chemical preservatives and their role, Antioxidants, and their role. (3L)		
Tutorials		**15**	1
1	**Industrial preparation of non-fermented beverages:** Fruit squash, syrups, and fruit juices. (3L)		
2	**Nutritional mocktails:** Definition, concept, composition, health benefits. (3L)		
3	**Industrial preparation of fermented beverages:** Fruit wines, Floral wines, apple cider, fermented red beet juice (3L)		
4	**Role of the following in fermentation technology:** Bacteria, Yeast, Anthocyanins, fruit, and floral essences (3L)		
5	**Preparation of probiotic fermented beverages:** Definition, concept, health benefits of probiotic fermented beverages. Probiotic lemonade, Coconut water Kefir, Fermented orange juice (3L)		

FYBCOM / FYBA – Botany - Open Elective - 1 (OE – 1): Landscaping and Urban Gardening
Open Elective – 2 (OE- 2): Food Processing Technology

College of Arts, Science & Commerce (Autonomous)

R I S E   W I T H   E D U C A T I O N

NAAC REACCREDITED "A" GRADE

Sion (West), Mumbai – 400022.

Department of Chemistry

Program: B.Sc.

Open Elective Course (OE) Course in Chemistry in Everyday Life

Syllabus for F.Y.B.Com \ F.Y.B.A Semester I and II

(To be implemented from 2023 – 2024)

Credit Based Semester and Grading System

Open Elective Course (OE)

Chemistry in Everyday Life

Open elective subject – Chemistry in Everyday Life is for F.Y.B.Com and F.Y.B.A. students. General knowledge, introduction, and application of the subject in daily life is expected to be known to the students.

THEORY (2 Credits) + TUTORIAL (2 Credits)

SEMESTER – I		
1	**:**	Chemistry in Everyday Life – I

SEMESTER – II		
1	**:**	Chemistry in Everyday Life – II

Open Elective Course (OE) in Chemistry in Everyday Life
CHEMISTRY IN EVERYDAY LIFE – I
Course Code:
4 Credits: 2 Theory + 2 Tutorial
SEMESTER – I

Unit – 1, 2Hr /Week	15 H
1 Chemistry in Everyday Life – I	**15 H**
1.1	**Unit-I: History and Introduction to Chemistry:** Introduction, History, Rasayana, Alchemy, Modern chemistry, Need of chemistry education **Unit-II: Chemistry of water and essential biomolecules of life:** Water, Food, Biomolecules and Nutrition **Unit-III: Chemistry of personal care and cleansing products:** Cosmetics, Soaps and Detergents **Unit-IV: Chemistry of colors** Dyes, Paint and Pigments **Unit-V: Chemistry of elastic and molded items:** Plastic, Monomers, Polymers, Rubber **Unit-VI: Agriculture chemistry:** Soil chemistry, Fertilizers, Insecticides, Pesticides	**15 H**

SUGGESTED REFERENCE

1. Chemistry in Your Everyday Life. By Thomas R. Rybolt, ISBN:9781978509467, 1978509464, Enslow Publishing, LLC
2. Chemistry in Action: The Molecules of Everyday Life, By Nina Morgan, ISBN:9780195210866, 0195210867, Oxford University Press
3. Why Chemical Reactions Happen, By James Keeler, Peter Wothers, ISBN:9780199249732,

0199249733, OUP Oxford press

4. The Beauty of Chemistry:Art, Wonder, and Science, By Philip Ball, SBN:9780262044417, 0262044412, MIT Press

CHEMISTRY IN EVERYDAY LIFE – II
Course Code:
4 Credits: 2 Theory + 2 Tutorial
SEMESTER – II

Unit – 1, 2Hr /Week	15 H
1 Chemistry in Everyday Life – II	**15 H**
1.1 **Unit-I: Chemistry of Energy and Fuels:** Petroleum products, Fossil fuels, Biofuels, Gobar gas, Fuel cells/batteries and Nuclear fuels. **Unit-II: Chemistry of construction and buildings:** Glass, Ceramics, Refractories, Cement **Unit-III: Chemistry of Metals, electricals and electronics:** Semiconductors, Metals, resistor in home appliances, Metals in daily life, Laser technology **Unit-IV: Chemistry of warfare and defense:** Riot control chemicals, Explosives, Chemicals in weapons, Grenade, Nuclear weapons. **Unit-V: Drug Chemistry, biocatalysts and chemical regulators of life:** Applications and types of drugs with examples, Indian Medicinal Plants, Hormones and Enzymes **Unit-VI: Routine chemo-reactions, chemistry role in pandemic and poisons** Chemical reactions in daily Life, Chemistry in pandemic, Poisons, Side-effect of some chemicals used in routine life	**15 H**

SUGGESTED REFERENCE

1. Chemistry in Your Everyday Life. By Thomas R. Rybolt, ISBN:9781978509467, 1978509464, Enslow Publishing, LLC
2. Chemistry in Action: The Molecules of Everyday Life, By Nina Morgan, ISBN:9780195210866, 0195210867, Oxford University Press
3. Why Chemical Reactions Happen, By James Keeler, Peter Wothers, ISBN:9780199249732, 0199249733, OUP Oxford press
4. The Beauty of Chemistry:Art, Wonder, and Science, By Philip Ball, SBN:9780262044417, 0262044412, MIT Press

MODALITY OF ASSESSMENT

Will be as per the guidelines of NEP and Board of Examination and conveyed to BOS for approval in due course of time.

AC /27.06.2023 /RS1

College of Arts,
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RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

SIES COLLEGE OF ARTS, SCIENCE ANDCOMMERCE

(Autonomous)

Affiliated to

UNIVERSITY OF MUMBAI

Syllabus for SEM I

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course: Open Elective 1 - Logical Reasoning and Mental Ability

Offered By: Department of Physics

(Choice Based Credit System (CBSC) with effect from the academic year 2023–2024 under NEP)

SEMESTER-I

Open Elective – I

Course Overview:

A course on logical reasoning and mental ability typically covers topics like deductive and inductive reasoning, critical thinking, problem-solving strategies, puzzles, logical puzzles, verbal and non-verbal reasoning, mathematical reasoning, decision making, and cognitive abilities. It aims to enhance analytical skills, improve logical thinking, and develop mental agility through exercises and practice problems.

Scheme of examination:
(i) Tutorials: Internal (Continuous evaluation): 50 marks

Sr. No.	Particulars	Marks
1.	6 of 8 tutorial assignment/ based on the curriculum to be assessed by the teacher concerned and active participation in routine class instructional deliveries.	30
2.	One Class Test to be conducted in the given semester.	20

(ii) Theory: Semester End Examination: 50 marks
Each theory paper shall be of two hour duration. Each unit will have 25 marks weightage. All questions are compulsory and will have internal options.

A candidate will be allowed to appear for the examination only if the candidate attends at least 75% of lectures and tutorials and submits at least 6 tutorials.

Open Elective Course – 1

Course Code	Title	Credits
SIUPYOE111	**Logical Reasoning and Mental ability**	4

Course outcome:

CO1. Understand logical reasoning using Venn diagram, symbolism and pattern

CO2. Understand the concept of arithmetic and logical deduction reasoning.

CO3. Understand the concept of data interpretation

UNIT I: Data interpretation skill and reasoning   15 hours

1. Venn diagram, Blood relation, Symbolism, Pattern, Seating arrangement, odd man out and series.

2. Data interpretation – Percentage, Pie, line chart etc…

UNIT II: Mental ability and Arithmetic skills   15 hours

1. Average, Problem of ages, Profit and loss, Simple interest, Compound interest, Ratio and proportion, Partnership.

2. Time, work and distance, Problems on train, Probability, Logical deduction.

Note: A good number of numerical examples are expected to be covered during the prescribed lectures.

References:
1. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S. Chand publications
2. R.S. Aggarwal, Quantitative Aptitude, S. Chand publications

Additional references:
1. Trishna Knowledge Systems, Data interpretation and logical reasoning for CAT, Pearson
2. Sinha & Nishit, Data Interpretation and Logical Reasoning
3. Vijay, S. Quantitative Aptitude: For Officers / Office Assistant Exams in IBPS, SBI, RBI, LIC, GICs....
4. Sharma, Arun,How to prepare for Quantitative Aptitude for the CAT: 5th ed

Tutorial based on paper **Logical Reasoning and Mental ability (SIUPYOE111) (2 credits / 30hrs)**

1. Venn diagram
2. Deciphering jumbled up description and relation puzzles
3. number series, alpha numeric series, pattern series
4. symbolism and pattern
5. data interpretation using pie and line chart
6. Finding percentage, simple and compound interest
7. Averages, profit and loss
8. Time work and distance
9. logical deduction
10. Probability

NAAC REACCREDITED - 'A' GRADE

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UNIVERSITY OF MUMBAI

Syllabus for SEM II

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course: Open Elective 2 - Basic Astronomy

Offered By: Department of Physics

(Choice Based Credit System (CBSC) with effect from the academic year 2023–2024 under NEP)

SEMESTER-II

<u>Open Elective - II</u>

Course Overview:

The Basic Astronomy course provides a fundamental understanding of the principles and concepts of astronomy, exploring the wonders of the universe and our place within it. This course covers a wide range of topics, including celestial objects, the solar system, stars and galaxies, the history of astronomy, expansion of the universe and recent astronomical discoveries. Through lectures, discussions, and practical exercises, students will develop observational skills and gain insights into the scientific methods used in astronomy. Reference materials from reputable sources will be utilized to enhance the learning experience.

Scheme of examination:

(i) Tutorials: Internal (Continuous evaluation): 50 marks

Sr. No.	Particulars	Marks
1.	6 of 8 tutorial assignment/ based on the curriculum to be assessed by the teacher concerned and active participation in routine class instructional deliveries.	30
2.	One Class Test to be conducted in the given semester.	20

(ii) Theory: Semester End Examination: 50 marks

Each theory paper shall be of two hour duration. Each unit will have 25 marks weightage. All questions are compulsory and will have internal options.

A candidate will be allowed to appear for the examination only if the candidate attends at least 75% of lectures and tutorials and submits at least 6 tutorials.

Open Elective Course – II

Course Code	Title	Credits
SIUPYOE121	**Basic Astronomy**	4

Course outcome:
CO1. Introduce participants to the fundamental concepts and principles of astronomy.
CO2. Familiarize participants with the night sky and teach them how to observe celestial objects.
CO3. Provide an understanding of our solar system, including the planets, moons, and other objects.
CO4. Explore the life cycle of stars, galaxies, and the universe as a whole.
CO5. Develop practical skills in stargazing and using telescopes.
CO6. Encourage curiosity and a deeper appreciation for the wonders of the cosmos.

Unit I

1. Brief history of astronomy and its significance, Introduction to the scientific method in astronomy, Discussion on the scale of the universe and celestial objects. Distance measurement.
2. Observing the sky: Basics of naked-eye observations (Day and night sky), True and apparent Magnitude. Understanding constellations, stars, and planets (How do we know the earth is spinning?), Size of the earth, Introduction to sky maps and star charts (Coordinates of heaven), Tips for stargazing and observing celestial events.
3. The moon and its phases: Exploration of Earth's natural satellite, the Moon, Understanding lunar phases, tides and eclipses, Notable lunar features and missions

Unit II

1. The Solar System: Structure and formation of the Solar System, Exploration of planets, moons, and other objects, Discussion on the Sun, asteroids, comets, and meteoroids, Overview of the planets in our Solar System, Characteristics, atmospheres, and notable features of each planet,
2. Stars and stellar evolution: Characteristics of stars and their classification, binary stars, The life cycle of stars and stellar evolution, Stellar phenomena such as supernovae and black holes.
3. Milky way and other galaxies: Overview of the Milky Way galaxy,   Types   and properties of galaxies, Introduction to cosmology and the study of the universe, The Big Bang theory and the origin of the universe, Expansion of the universe and Hubble's Law, Dark matter and dark energy
4. Introduction to telescope: Types of telescopes and their functions, Understanding telescope components and terminology, Tips for choosing and using a telescope

References:
1. "Astronomy: A Beginner's Guide to the Universe" by Eric Chaisson and Steve McMillan.
2. "The Backyard Astronomer's Guide" by Terence Dickinson and Alan Dyer.
3. "NightWatch: A Practical Guide to Viewing the Universe" by Terence Dickinson.
4. "Astronomy Beginner's guide" by William H. Waller
5. "Astronomy Demystified" By Stan Gibilisco

Tutorial/workshop/experiment/(problem solving sessions) based on Basic Astronomy (2 credits / 30hrs)

1. Use of homemade sextant for measuring the height of a structure, angles of the star. Estimation of latitude and time and tilt of earth using elevation of pole star. (multiple experiments)

2. Measurement of distance using various methods.

3. Plotting graph of various properties of planets with distance. (multiple experiments)

4. Tracking the star to measure the rate of rotation of the earth.

5. Study the globe.

6. Measurement of time using the position of the star.

7. Measuring the temperature of a light source from the intensity and known distance. (using Stefan's law/Wein's displacement law)

8. Experiment (demonstration) on tidal forces.

9. Experiment (demonstration) on doppler effect

10. Experiment (demonstration) on lens system.

11. Understanding Foucault Pendulum.

12. Mapping intensity distribution in a room using an LDR or the variation of intensity throughout a day.

13. To learn how to use a sky map, learn to locate constellations, stars and planets at any time of year.

14. Scaling the positions of the planets, place the sun at the centre of the paper, and use the concentric circles as the orbits.

Demonstrations including Audio visual demonstration can be carried out, followed by a problem-solving session. Minimum 6 tutorials from the above list should be submitted in a semester.
Report on one industrial visit/star gazing session being equivalent to 2 tutorials sessions.
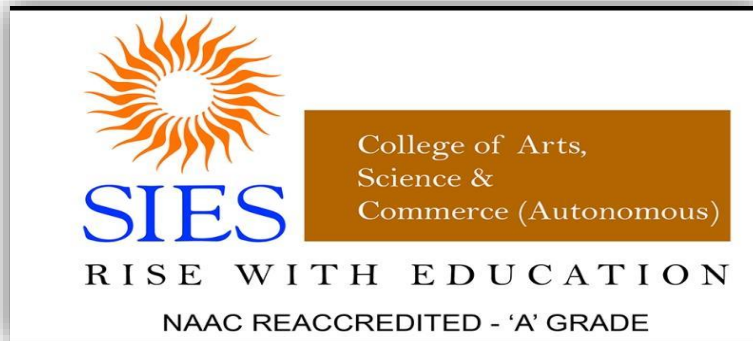
Faculty: Arts

Syllabus For Open Elective (OE) Papers
Under NEP, approved by
The Board of Studies in History for
FY, Semester I & Semester II
with effect from June 2023

FY, OE (Open Elective paper) offered to the students of Science and Commerce faculty only.

Semester I

Paper Title: Understanding History of Mumbai
No. of Lectures: 4 per week- 1 hr. Each
Marks: 60+40=100
 Credits: 4

Learning Objectives:
1. To provide a Broad review and inculcate an understanding of local history
2. To develop among students, a basic knowledge of the growth of the city as urban centre.
3. To inform background of regional history for competitive examinations.

Course Outcomes:
- Understand evolution of Mumbai city and its growth.
- Learn about city's economic progress.
- To connect with the cultural markers of the city.

Module I: Evolution of City
 a. From Seven Islands to the early development
b. Centre of Presidency
 b. Inter-land expansion and Landmarks of Mumbai.

Module II: Growth and Development
a. The settlers and Communities of Mumbai
b. Urban Expansion of the City
c. Transport and Communication

Module III: Emergence as Trade and Economy Centre.
 a. Opium and Cotton Trade
b. Textile Industry and other Industries
b. Banking and Stock Exchange

Module IV: Cultural Markers
a. Education and Research Centres
b. Art and Architecture.
c. Theatre and Cinema

Suggested Readings:

* Chopra, Preeti, A Joint Enterprise: Indian Elites and the making of British Bombay, University of Minnesota Press, 2011.

* Da Cunha, J Gerson, The Origin of Bombay, AES Reprint, 1993.

* David, M. D., Bombay, The City of Dreams; A History of the First City in India, Himalaya Publishing House, 1998.

* David, M. D., History of Bombay 1661-1708, University of Bombay, 1973.

* Dobbin, C, Urban leadership in Western India, politics and communities in Bombay City, 1840- 1885, 1972.

* Doshi, Sarayu, Maharashtra, Marg Publications, 1985.

* Dossal, Mariam, Imperial Designs, and Indian Realities. The Planning of Bombay City, 1845-1875, Oxford University Press, 1991.

* Dossal, Mariam, Theatre of Conflict, City of Hope Mumbai 1660 to Present Times, Oxford University Press, 2010.

* Dwivedi, Sharada & Mehrotra, Rahul, Bombay The Cities Within, Eminence Designs Pvt. Ltd., 2001. Dwivedi, Sharada & Mehrotra, Rahul, Fort Walks: Around Bombay's Fort Area. Eminence Designs Pvt. Ltd., 1999.

* Edwardes Gazetteer of Bombay City and Island, 3 vols. Bombay 1909-1910.

* Kamat, Manjiri, (author and ed.), Mumbai Past and Present, Indus Source Books, 2013

* Kosambi, Meera, Bombay in Transition: The Growth and Social Ecology of a Colonial City, 1880-1980, Almqvist & WiCell International, 1986.

* Lakdawalla (et.al), Work, Wages and Well-being in an Indian Metropolis: Economic Survey of Bombay City, University of Bombay, 1963.

* London, Christopher W., Bombay Gothic, India Series. India Book House, 200

FY, OE (Open Elective paper) offered to the students of Science and Commerce faculty only.

Semester II

Paper Title: An Overview of Cultural Aspects of Maharashtra
No. of Lectures: 4 per week- 1 hr. Each
Marks: 60+40=100
 Credits: 4

Learning Objectives:
- To introduce the regional identity.
- To connect with the cultural expression of the State

Course Outcomes:
- Understand and learn about the geographical and linguistic features of Maharashtra.
- Learn about the landmark Architecture of Maharashtra.
- Acquaint students with the Cultural aspects of Maharashtra.

Module I: Evolution of the Region
a. Geographical features
b. People and Society
c. Development of Marathi Language

Module II: landmark Architecture

a. Rock Cut Caves
b. Forts Architecture
c. Structural Buildings

Module III: Defining Cultural Aspects I

a**.** Food and Festivals
b. Marathi Theatre and Cinema
c. Marathi Press

Module IV: Defining Aspects II
a. Marathi Literature
b. Performing and Fine Arts
c. Games and Sports

Suggested Readings:

- B . Kenneth, Social Policy, and Social Change in Western India: 1817 – 1830,

Oxford University Press, London, 1961.

- Banhatti Rajendra and Jogalekar G.N. (ed.) A History of Modern Marathi

Literature, Vol. I and II, Maharashtra Sahitya Parishad, Pune 1998.

- Chaudhari K.K., Maharashtra State Gazetteers, History of Mumbai, Modern Period,

- Gazetteers Department, Government of Maharashtra, Mumbai, 1987.

- Chaudhari, K.K, Maharashtra and the Indian Freedom Struggle, Govt. of Maharashtra, Bombay, 1985.

- Choksy,R.D., Economic Life in the Deccan,1888-1896, Asia Publishing House, Bombay, 1965.

- Sunthankar; History of Maharashtra, Vol I & II

- Doshi Sarayu, Maharashtra; Marg Publication 1984

- Dalvi Dawood: Maharashtrachi Shilp Leni (Marathi)

Examination Assessment Pattern for Semester I & II

● The Assessment will follow a 60:40 pattern
 60 marks- Semester-Ends Exam
 40 marks- Internal Assessment

● 40 marks of the Internal Assessment
 20 marks – Test
 20 marks-Assignments and presentation (Group Project)

College of Arts,
Science &
Commerce (Autonomous)

SIES

R I S E   W I T H   E D U C A T I O N

NAAC REACCREDITED - 'A' GRADE

SIES College of Arts, Science and Commerce

(Autonomous)

Affiliated to University of Mumbai

Syllabus under NEP - June 2023
with effect from the academic year 2023-24

Department of Mathematics
Open Elective Courses

Sem I: Business Mathematics and Statistics I
Sem II: Business Mathematics and Statistics II

offered to F.Y. B.Com.

Choice Based Credit System (CBCS)

SIES COLLEGE OF ARTS, SCIENCE AND COMMERCE(AUTONOMOUS), SION WEST

CONTENTS

1. Course structure with minimum credits and Lectures/ Week
2. Syllabus for semester I with Course Outcomes and Scheme of Evaluation
3. Syllabus for semester II with Course Outcomes and Scheme of Evaluation

SIES COLLEGE OF ARTS, SCIENCE AND COMMERCE(AUTONOMOUS), SION WEST

1. Course structure with minimum credits and Lectures/ Week

Type	Course Code	Sem	Course Name	Credits	L/P/T (per week)
OPEN ELECTIVE (OE)	**SIUMTOE111**	I	**Business Mathematics and Statistics I**	2+2	2L+2T
			Unit 1: Commission, Brokerage and Discount.		
			Unit 2: Shares and Mutual Funds		
			Unit 3: Measures of Central Tendencies and Measures of Dispersions		
			Unit 4: Decision Theory		
	SIUMTOE121	II	**Business Mathematics and Statistics II**	2+2	2L+2T
			Unit 1: Functions, Differentiation and Annuity		
			Unit 2: Bivariate Linear Correlation		
			Unit 3: Regression		
			Unit 4: Time series and Index Numbers		
1L = 1 Hour per week, 1T= 1 Hour per week, 1P (Practical) = 2 Hours per week					

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2. Syllabus for Semester I with Course Outcomes

Course Name: Business Mathematics and Statistics I Credits: 4 , 2L , 2 T

Expected Course Outcomes:

After completion of the course, students will be able to

1. understand concepts in commission brokerage and discount, shares and mutual funds, measures of central tendency such as Mean, Median, Mode, Quartiles, Deciles, Percentiles; measures of dispersion such as Quartile deviation, Mean deviation, Standard deviation and state the relevant definitions, decision theory

2. solve problems of shares and mutual funds, measures of central tendency, measures of dispersion, decision theory

Pre-requisites: Percentage, Ratio and Proportion, Basic Probability

Unit I: Commission, Brokerage and Discount.

a) Simple examples on Commission and Brokerage

b) Discounts: Trade discount, cash discount, profit and loss

Unit II: Shares and Mutual Funds

a) **Shares**: Concept of share, face value, market value, dividend, equity shares, preferential shares, bonus shares. Simple examples

b) **Mutual Funds**: Simple problems on calculation of Net income after considering entry load, dividend, change in Net Asset Value (N.A.V.) and exit load. Averaging of price under the Systematic Investment Plan (S.I.P.)

Unit II: Measures of Central Tendencies and Measures of Dispersion:

a) **Graphs**: Drawing of Frequency Curves, Histogram and ogives.

b) **Measures of Central Tendencies:** Definition of Average, Types of Averages: Arithmetic Mean, Median, and Mode for grouped as well as ungrouped data. Quartiles, Deciles and Percentiles. Using Ogive to locate median and Quartiles. Using Histogram to locate mode. Combined and Weighted mean.

c) **Measures of Dispersions**:
Concept and idea of dispersion. Various measures Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance, Combined Variance.

Unit IV: Decision Theory:

Decision making situation, Decision maker, Courses of Action, States of Nature, Pay-off and Pay-off matrix; Decision making under uncertainty, Maximin, Maximax, Minimax regret and Laplace criteria; simple examples to find optimum decision. Formulation of Payoff Matrix. Decision making under Risk, Expected Monetary Value (EMV); Expected Opportunity Loss(EOL), Decision Tree; Simple examples based on EMV. Expected Opportunity Loss (EOL), simple examples based on EOL.

Tutorials

Tut No	**Topic**
1	Commision and Brokerage
2	Discounts
3	Shares
4	Mutual Funds
5	Measures of central tendency- Graphical Methods and using formula
6	Measures of dispersion
7	Decision making under uncertainty
8	Decision making under risk

References:

1) Business Mathematics by D. C. Sancheti and V. K. Kapoor, Sultan Chand & Sons.

2) STATISTICS by Schaum Series.

3) Operations Research by Gupta and Kapoor.

4) Fundamentals of Statistics - D. N. Elhance.

5) Statistical Methods - S.G. Gupta, S. Chand & Co.

6) Business Mathematics & Statistics : B Aggarwal, Ane Book Pvt. Limited.

7) Business Mathematics : A P Verma, Asian Books Pvt. :Limited.

8) Mathematical And Statistical Techniques - I FYBcom Sem 2 Sheth Publication

Scheme of Evaluation:

I) Continuous Internal Evaluation (50 Marks)	
Class Test I (Objective type)	20 Marks
Class Test II (Descriptive type)	15 Marks
Tutorial Notebook	10 Marks
Class Participation/Attendance	5 marks
II) Theory Examination (50 Marks)	
Semester End Examination based on entire syllabus	50 Marks

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3. Syllabus for Semester II with Course Outcomes

Course Name: Business Mathematics and Statistics II, Credits :4,   2L, 2T

Expected Course Outcomes:

After completion of the course, students will be able to

1. understand concepts in differentiation, annuity, bivariate linear correlation and regression, time series, index numbers

2. solve problems of applications of derivatives, annuity, bivariate linear correlation and regression, time series, index numbers.

Pre-requisites: Simple and compound interest, equations of lines in a plane

Unit I : Functions, Derivatives and Their Applications

a) **Concept of real functions:** constant function, linear function,$\Box^\Box$,$\Box^\Box$, $\Box^\Box$,log x.

Demand, Supply, Total Revenue, Average Revenue, Total cost, Average cost and Profit Function, Equilibrium Point, Break-even point.

b) **Derivative of functions:**

i. Derivative as rate measure, Derivative of x^n, a^x, e^x, log x.

ii. Rules of derivatives: Scalar multiplication, sum, difference, product, quotient (Statements only), Simple problems. Second order derivatives.

iii. Applications: Marginal Cost, Marginal Revenue, Elasticity of Demand. Maxima and Minima for functions in Economics and Commerce.

c) Annuity:

Annuity Immediate and its Present value, Future value. Equated Monthly Installments (EMI) using reducing balance method & amortization of loans. Stated Annual Rate & Effective Annual Rate Perpetuity and its present value. Simple problems involving up to 4 time periods.

Unit II: Bivariate Linear Correlation:

Meaning, Types of Correlation, Determination of Correlation: Scatter diagram, Karl Pearson's method of Correlation Coefficient (excluding Bivariate Frequency Distribution Table) and Spearman's Rank Correlation Coefficient.

Unit III: Regression:

Meaning, Concept of Regression equations, Slope of the Regression Line and its interpretation. Regression Coefficients (excluding Bivariate Frequency Distribution Table), Relationship between Coefficient of Correlation and Regression Coefficients, Finding the equations of Regression lines by method of Least Squares.

Unit IV: Time series and Index Numbers

a) **Time series**: Concepts and components of a time series. Representation of trend by Freehand Curve Method, Estimation of Trend using Moving Average Method and Least Squares Method (Linear Trend only). Estimation of Seasonal Component using Simple Arithmetic Mean for Additive Model only (For Trend free data only). Concept of Forecasting using Least Squares Method.

b) **Index Numbers:** Concept and usage of Index numbers, Types of Index numbers, Aggregate and Relative Index Numbers, Lasperye's, Paasche's, Dorbisch-Bowley's, Marshall-Edgeworth and Fisher's ideal index numbers, Test of Consistency: Time Reversal Test and Factor Reversal Test. Chain Base Index Nos. Shifting of Base year. Cost of Living Index Numbers, Concept of Real Income, Concept of Wholesale Price

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Index Number.

Tutorials

Tut No	Topic
1	Differentiation and its applications
2	Annuity
3	Correlation Analysis 1
4	Correlation Analysis 2
5	Regression Analysis 1
6	Regression Analysis 2
7	Time Series
8	Index Numbers

References:

1) Business Mathematics by D. C. Sancheti and V. K. Kapoor, Sultan Chand & Sons.

2) STATISTICS by Schaum Series.

3) Operations Research by Gupta and Kapoor.

4) Fundamentals of Statistics - D. N. Elhance.

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