

**SES SHIKSHAN MAHARSHI DADASAHEB LIMAYE COLLEGE**

**KALAMBOLI-410218**

**Course Outcome, Program Outcome, Program Specific Outcome**

**Academic Year 2018-2019**

**Name of Faculty- Prof. Seema M. Rawat**

**Class- F.Y. B.A.**

**Subject- Communication Skills in English**

**Semester- 1**

**Department- English**

**COURSE OUTCOME**

- I. Understand the role of communication in personal & professional success.
- II. Develop awareness of appropriate communication strategies.
- III. Prepare and present messages with a specific intent.
- IV. Analyze a variety of communication acts.
- V. Ethically use, document and integrate sources.

**PROGRAMME OUTCOME**

**I. Understand the role of communication in personal and professional success.**

- Class Discussions (Units 1-3, 5-8)
- Learn Smart Study Modules (Units 1-7)
- Intercultural Perspectives Project (Unit 4)
- Interpersonal Film Analysis Research Paper (Unit 5)
- Presentations (Unit 6 and Unit 7)
- Exams (Midterm assesses Units 1-5) (Final assesses Units 6-8)

## **II. Develop awareness of appropriate communication strategies.**

- Class Discussions (Units 1-3, 5-8)
- Learn Smart Study Modules (Units 1-7)
- Intercultural Perspectives Project (Unit 4)
- Interpersonal Film Analysis Research Paper (Unit 5)
- Presentations (Unit 6 and Unit 7)
- Exams (Midterm assesses Units 1-5) (Final assesses Units 6-8)

## **III. Prepare and present messages with a specific intent.**

- Class Discussions (Units 1-3, 5-8)
- Intercultural Perspectives Project (Unit 4)
- Interpersonal Film Analysis Research Paper (Unit 5)
- Presentations (Unit 6 and Unit 7)

## **IV. Analyze a variety of communication acts.**

- Class Discussions (Units 1-3, 5-8)
- Learn Smart Study Modules (Units 1-7)
- Intercultural Perspectives Project (Unit 4)
- Interpersonal Film Analysis Research Paper (Unit 5)
- Presentations (Unit 6 and Unit 7)
- Peer Critiques (Unit 7)

## **V. Ethically use, document and integrate sources.**

- Class Discussions (Units 1-3, 5-8)
- Intercultural Perspectives Project (Unit 4)
- Interpersonal Film Analysis Research Paper (Unit 5)
- Presentations (Unit 6 and Unit 7)
- Exams (Midterm assesses Units 1-5) (Final assesses Units 6-8)

## **SPECIFIC OUTCOME**

### **I. Understand the role of communication in personal & professional success.**

1. Students will identify and explain their goals for the semester.
2. Identify the needs communication helps us meet.
3. Identify common misconceptions about communication
4. Explain communication competence
5. Identify the reasons we commit perceptual errors.
6. Differentiate self-serving bias, confirmation bias, and fundamental attribution error.
7. Identify the reasons people use language
8. Describe and contrast the nonverbal communication channels.
9. Identify the needs communication helps us meet
10. Identify reasons why we form a variety of social relationships.
11. Identify and explain the steps in forming and dissolving relationships
12. Identify and apply methods of relating your topic to a specific audience.
13. Identify ways to constructively manage speaking anxiety and apply the methods while presenting.
14. Identify and apply the steps for preparing an effective presentation.
15. Identify the functions of small groups.
16. Identify the advantages of communicating in small groups.
17. Identify the challenges of taking part in small groups.
18. Identify advantages of communicating using technology.
19. Identify challenges of communicating using technology.

## **PROGRAMME OUTCOME**

1. Introduce students to the course design and course tools.
2. Differentiate the action, interaction, and transaction models of communication
3. Define the process of both perception and listening.
4. Recall the importance of listening effectively.
5. Describe strategies for improving your nonverbal interpretation and expression skills.
6. Identify strategies for communicating with cultural awareness
7. Identify and explain how social relationships vary in handling important communication behaviors and conflict.
8. Explain how to improve communication in your social relationships, especially family and intimate relationships.
9. Explain and apply the rhetorical goals of persuasive and informative speaking.
10. Identify and apply strategies for establishing credibility with an audience.
11. Identify and apply effective strategies for preparing and using presentation aids in a speech.
12. Identify and apply strategies for maintaining positive relationships within a group.
13. Identify the methods by which groups make decisions.
14. Describe how to manage conflict constructively and apply these skills.
15. Identify and apply strategies for communicating using technology.

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**KALAMBOLI-410218**

**Course Outcome, Program Outcome, Program Specific Outcome**  
**Academic Year 2018-2019**

**Name of Faculty- Prof. Seema M. Rawat**

**Class- F.Y. B.A.**

**Subject- Communication Skills in English**

**Semester-2**

**Department- English**

**COURSE OUTCOME**

- I. Understand the role of communication in personal & professional success.
- II. Develop awareness of appropriate communication strategies.
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## **PROGRAMME OUTCOME**

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13. Identify the methods by which groups make decisions.
14. Describe how to manage conflict constructively and apply these skills.
15. Identify and apply strategies for communicating using technology.





Department of Geography  
FOUNDATION COURSE- I  
Year 2018-19

Program outcome •

1. This course is designed to create social awareness at a preliminary level for students across the board
2. To help the students to upgrade their knowledge on current challenges and issues of Indian society
3. To sensitize students about social problems plaguing Indian society
4. To emphasize the role of educated youth to address the same.

Course Outcome: -

Sem-I

1. Creates understanding of multi-lingual, multireligious, multi-cultural nature & political nature of Indian society.
2. Creates understanding of the Indian Constitution & the disparity in Indian society

Sem-II

1. Makes learners understand different evolution of Human Rights.
2. Creates the basic understanding about the issues related to economic changes and its impact on different fields.

S.Y.B.A.

Foundation Course II , Sem-III

Course Outcome: -

1. Gives basic understanding on issues related to human rights violations, ecology and urban-rural disparities in access to health and education.
2. Creates the importance of developing scientific temper towards technology and its use in everyday life.

## Foundation Course II, Sem-IV

1. Develops a basic understanding about rights of citizen, ecology, role of modern technology.
2. Provides an overview of significant skills required to address competition in career choices.

*P. P. Mahajan*  
Head

Department of Geography  
S. M. D. L. College, Kalamboli.



*S. M. Dadasaheb Limaye*  
PRINCIPAL

SES'S S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal.- Panvel, Dist. - Raigad.

**Program Outcomes :- B.A. Marathi**

(2018-2019)

<b>Department of Marathi</b>	<b>After successful completion of three year degree program in Marathi ,Student should be able to</b>
<b>Program Outcomes</b>	<p>१. विशिष्ट कालखंडातील साहित्यामागील प्रेरणा आणि प्रवृत्तींचे ज्ञान करून घेतो.</p> <p>२. अभ्यास करण्याची क्षमता विकसित होते.</p> <p>३. जागतिकीकरणाच्या काळात बदलत्या क्षेत्रांना सामोरे जाण्यासाठी भाषिक क्षमता विकसित करता येते.</p> <p>४. विविध प्रकारची लेखनकौशल्ये शिकता येते.</p> <p>५. साहित्याचा आस्वाद कसं घ्यावा याची क्षमता विकसित होते.</p> <p>६. टीका किंवा समीक्षा कशा पद्धतीने करावी याचे ज्ञान वृद्धिंगत होते.</p> <p>७. मराठी साहित्यात काळानुरूप येणारे विविध प्रवाह माहित होतात.</p>
<b>Program Specific Outcomes</b>	<p>१. या प्रवाहाची करणमीमांसा करता येते.</p> <p>२. वाङ्मयीन अभिरुची संपन्न होते.</p> <p>३. संशोधन कसे करावे व कोणत्या पद्धतीने करावे याविषयी दृष्टी विकसित होते.</p> <p>४. प्रसार माध्यमांसाठी लेखन कसे करावे याविषयी ज्ञान मिळते.</p> <p>५. व्यक्तिमत्व विकासामध्ये भाषिक कौशल्याचा कसा उपयोग करता येईल याची माहिती होते.</p>

Course Outcomes B. A. Marathi	
Course	Outcomes
मराठी ( अनिवार्य )	<p>After completion of these students should be able to</p> <ol style="list-style-type: none"> <li>१. मराठी साहित्यातील विविध वाङ्मयीन परंपरा माहीत होतात.</li> <li>२. मराठी साहित्याबाबत आवड निर्माण होते.</li> <li>३. विविध साहित्य प्रकारांचा परिचय होतो.</li> <li>४. मराठी भाषेचे व्यक्तिमत्व विकासातील महत्व लक्षात येते.</li> <li>५. व्यावहारिक मराठी शिकण्यातून मराठी शुद्धलेखन व व्यवहारातील लागणारे याविषयी माहिती होते.</li> </ol>
मराठी ( ऐच्छिक ) - अभ्यासपत्रिका क्रं. - ३	<ol style="list-style-type: none"> <li>१. विविध साहित्य प्रकारांची ओळख होते.</li> <li>२. पारिभाषिक सजांचा परिचय होतो.</li> <li>३. मानवी भाषा, समाज व संस्कृती यांचा अन्योन्यसंबंध काय याची माहिती होते.</li> <li>४. मानवी भाषेच्या स्वरूपाची ओळख होते.</li> <li>५. बोलींच्या अभ्यासाची गरज जाणून घेता येते.</li> <li>६. विविध बोलींचा अभ्यास केल्याने मराठी भाषेच्या समृद्ध परंपरेची ओळख होते.</li> <li>७. बोलींच्या वैशिष्ट्यांचा परिचय होतो.</li> <li>८. बोली भाषेतील निवडक साहित्याचा परिचय होतो.</li> </ol>
मराठी विशेषस्तर अभ्यासपत्रिका क्रं. ७ - भाषाविज्ञान व मराठी व्याकरण	<ol style="list-style-type: none"> <li>१. भाषाविज्ञानाची ओळख होते.</li> <li>२. भाषेच्या अभ्यासाचे महत्व समजून घेत येते</li> <li>३. भाषेच्या प्रमुख अंगांचा परिचय करून घेत येतो.</li> <li>४. मराठी व्याकरणातील सखोलता लक्षात येते.</li> </ol>



	<p>५. व्याकरणाच्या विविध तत्वांचा सविस्तर परिचय होतो.</p> <p>६. व्याकरण आणि भाषाविज्ञान यातील महत्वाचा भेद लक्षात येतो.</p>
<p>मराठी विशेषस्तर अभ्यासपत्रिका क्रं. ८ - आधुनिक मराठी साहित्य</p>	<p>१. आधुनिक साहित्याचा परिचय होतो.</p> <p>२. वेगवेगळ्या रुपबंधाचे आकलन होते.</p> <p>३. कथा, कविता, कादंबरी व नाटक या चार साहित्य प्रकारांचा अभ्यास करता येतो.</p> <p>४. वेगवेगळ्या आशयानुरूप आलेल्या साहित्याचा त्यानुसार विचार करण्याची दृष्टी निर्माण होते.</p> <p>५. सामाजिक व भाषिक अवकाश विकसित होतो.</p>
<p>मराठी विशेषस्तर अभ्यासपत्रिका क्रं. ९ - व्यवसायभिमुख मराठी</p>	<p>१. पूर्णतः व्यवसायभिमुख अभ्यास करता येतो.</p> <p>२. भाषांतर संकल्पना कळते व व्यवसायात त्याचा कसं उपयोग करता येईल हे समजते.</p> <p>३ मराठीतील भाषिक कौशल्याचा वापर करून प्रसार मध्यमांमध्ये कामाच्या संधी मिळतात.</p> <p>४. मुलाखत ग्रंथपरीक्षण यासारख्या घटकांचा व्यवसायिकदृष्ट्या चांगला उपयोग करून घेत येतो.</p> <p>५. स्वमत व्यक्त करण्याचा सराव होतो.</p>

*Kalamboli*



*Principal*

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Shikshan Maharshi Dadasaheb Limaye Arts Commerce and Science College

Kalamboli Navi Mumbai.

DEPARTMENT OF ECONOMICS

Programme Specific Outcomes (PSO)

Academic Year- 2018-19

- Student are able to understand basic concepts of Economics
- Student are able to understand planning
- Provided valuable knowledge for making decision in everyday life of students.
- Student are able to understand Social and Economic problem of Indian economy
- Students are able to suggest of the various economic problem.
- Creating awareness about changing macro-economic policies and theories
- Development research knowledge in economics.
- learners are able to understand recent developments in the economy

**F. Y. B.A. ECONOMICS, SEMESTER I, MICROECONOMICS-I: PAPER I :** This course is designed to introduce the students, ten principles of Economics, understanding Basic concept of microeconomics and the role of government in the economy.

**MACROECONOMICS-I: PAPER I SEMESTER II :** This course is designed to introduce the student to the basic building blocks of macroeconomics. Using an open Economy framework, the course develops an understanding of the constituents of the open Economy. The student should be able to build on the constituents in the future years so as to be able to analyze macroeconomic policies.

**S.Y.B.A. MICROECONOMICS-II: PAPER III, SEMESTER III :** The course is designed to develop the students' understanding of basic tools of microeconomics analysis. It builds on the material covered in the Semester I and is designed to help the student apply microeconomics to the real world .

**MACROECONOMICS-II: PAPER V, SEMESTER IV :** This paper is designed to build on the understanding of basic macroeconomics identity introduced in SEM II. The various components detailed here in the context of a closed economy. The objective is to enable the student to understand how interest rate and income level are determined in a closed economy and how policy may affect these outcomes.

**S.Y.B.A SEMESTER III and IV, INDIAN ECONOMY :CONTEMPORARY CONCERNS PAPER IV, SEMESTER III :** This paper covers the material in the Economic Survey of the Government of India that academic year. After the publication of the economic survey, The Board of Studies On Economics will finalize four topics from the Survey to be taught in diet year. The Topic for the year 2017- 2018 will be chapters 3,5,6,9 and 10 to be classified into four models.

**DEVELOPMENT ISSUES OF MAHARASHTRA'S ECONOMY: PAPER VI, SEMESTER IV :** Students will study contemporary economic issues with respect to Indian economy in the context of Economic survey of the Government of India while in semester IV, student development issues of Maharashtra's Economy in the context of Report of the the High Level Committee on Balanced Regional Development issue in Maharashtra, Planning Department, Government of Maharashtra 2013

**T.Y.B.A. SEMESTER V**

**MICROECONOMICS III: PAPER VII, :** The course is designed to provide sound understanding in microeconomics theory. Since students have been taught perfect competition, this course focuses on three aspects, which are the study of imperfect competition, general equilibrium and welfare economics.





**ECONOMICS OF DEVELOPMENT: PAPER VIII :** The course is designed to inculcate diverse concepts related to economic growth and development by giving special emphasis on structural issues related to process development. In order to create awareness on policy options, the pressing problems on the path of the developments such as inequality, poverty and technological aspects are dealt in.

**INDUSTRIAL AND LABOUR ECONOMICS: PAPER IX :** This paper intends to equip the students with the knowledge about fundamentals of Industrial Economics and also the changing policies related to the Indian Industry in the globalised era.

**ECONOMIC HISTORY OF INDIA: 1857 - 1947: PAPER X:** This course analyses key aspects of Indian Economic developments during the second half of British colonial rule. It investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the colonial rule.

**ENVIRONMENTAL ECONOMICS: PAPER XI:** This course focuses on economic causes of environmental problems, In particulars, principles are applied to environmental questions and their management. Economic implications of environmental policy are addressed as well as valuation of environmental improvements.

**HISTORY OF ECONOMICS Thought : PAPER XII :** This course provides basic understanding about the celebrated economists and their contributions starting from the classical period. It throws light on the contributions of Nobel Laureates of recent period too.

#### **TYBA ( SEMESTER - VI)**

**MACROECONOMICS III: PAPER XIII :** This course introduces the students to formal modeling of macroeconomic theory with analytical tools. It focuses on the goods market with fixed exchange rate, the money market, uncovered interest rate parity and the benefits and costs of fixed and flexible exchange rates.

**INTERNATIONAL ECONOMICS: PAPER XIV:** This course develops a systematic exposition of models which explain the composition, direction, and consequences of international trade, and the determinants and effects of trade policy. It then built on models of open economy macroeconomics focusing on national policies as well as international monetary systems, It concludes with an analytical account of the causes and consequences of the rapid expansions of international monetary systems. It concludes with an analytical account of the causes and consequences of the rapid expansions of international financial flows in recent years.

**INDUSTRIAL AND LABOUR ECONOMICS: PAPER XV :** This paper Intends to provide knowledge of the Labour Market, Wage policy, Trade unions and amicable solutions to Industrial Disputes and also discuss the importance of labour welfare and Social Security measures for growing labour force in India.

**INDIAN ECONOMY THOUGHT: PAPER XVI :** The course will give the student an introduction to major Indian thinkers and their ideas on Indian economic policy and their contributions to Indian Economy.

**DEVELOPMENT THEORY AND EXPERIENCE: PAPER XVII:** The course begins with demographic concepts and their evolution during the process of development. Then it focuses on the theory migration and discusses the link between migration and development. The structure of the market and contracts linked to the particulars problems of enforcement experienced in poor countries. The course ends with the issues related to environment and development.



**INTERNATIONAL TRADE, POLICY AND PRACTICE: PAPER – XVIII :** This course is designed to address the changing phase of international Trade policy and practice. The main purpose of this course is to expose students to current trends in international developments.

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Department of Economics  
**Head**  
Department of Economics  
S. M. D. L. College, Kalamboli.



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Principal  
**PRINCIPAL**  
S.E.S.'s S. M. Dadasaheb Limaye  
College, Kalamboli,  
Tal : Panvel, Dist : Raigad.



## SMDL COLLEGE KALAMBOLI ,DEPARTMENT OF ECONOMICS 2018-19

### Program Outcomes

- know the basic concepts and theories its evolution, Scope, Importance and Nature of Economics as a subject
- Evaluate the economic system of India and understand the strengths and weakness of the country
- Accessing the economic planning and its competence with the Private sector and monetary policy
- Evaluating the setup of International economic policy and HRM
- To know the essence of world Trade in the course of Indian economy
- Discuss the Indian budget
- Understanding the ethical moral values in economy
- Conceptual understanding of economy of Maharashtra
- To understand concept of entrepreneurship and SSIM
- Evaluating the role of money in the Global level
- Understanding the new trends in LPG (liberalization privatization globalization) such as New economic zone
- Understand the basic concepts of Indian Economics.
- Students acquired the knowledge of Indian and world economy.
- Introduce ten principles of economics understand
- Develop and understanding of constituents of open economy
- Understand contemporary economic issues of Indian economy and Maharashtra economy.
- Knowledge about Indian economy in colonial context and mechanism link economic development in India.
- Knowledge about Indian thinkers.
- Knowledge about the issues related to environment and development.

### Course Outcomes

- Understand the meaning, nature, scope of economic
- To understand utility demand analysis and types elasticity.
- Understanding Demand forecasting of business unit
- Analysis objective of firm and industry.
- Understand the basic knowledge of Production Function
- Ability to understand the micro and macro economics
- Able to analyses the performance of firms under different market structures
- Recognize how monetary and fiscal policy can be used to achieve policy goals
- Understood the concept of economic development



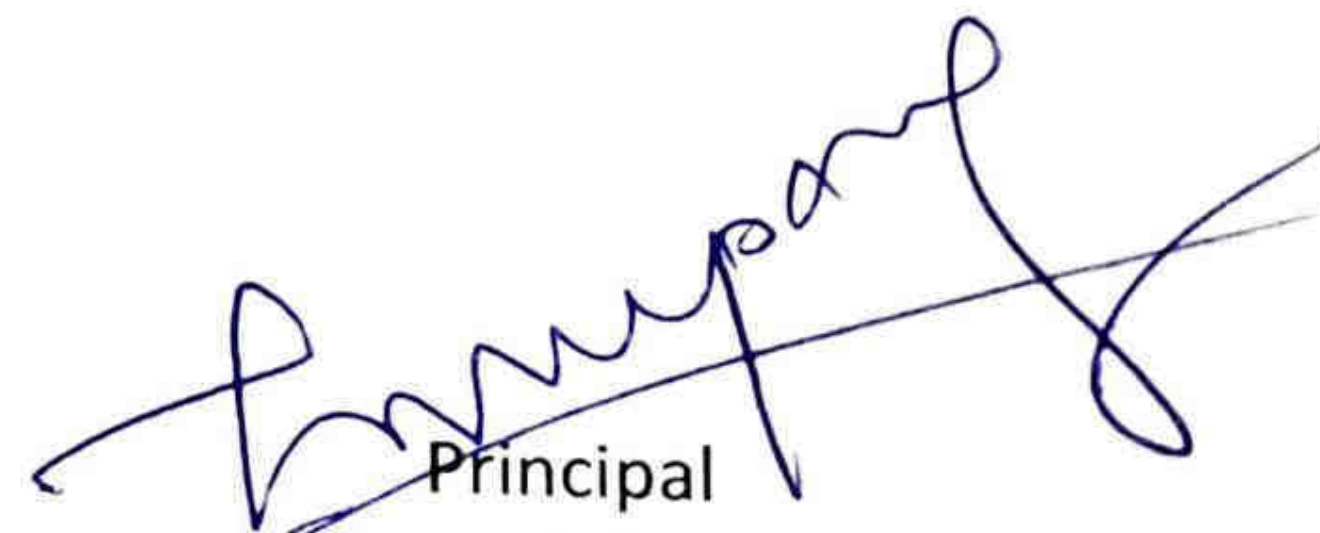
  
PRINCIPAL  
S.E.S.'s S. M. Dadasaheb Limaye  
College, Kalamboli,  
Tal : Panvel, Dist : Raigad



- Students acquired knowledge about inequality, poverty, Education, health and family welfare
- Acquired knowledge of agricultural prices, marketing, finance & subsidies in India
- To aware the students about financial institutions and its function.
- Able students to build on the constituents in the future years.
- To help the students apply micro economics to the real world.
- To enable the students knowing the economic survey of India.
- Analysis key aspects of Indian economic development during second half of British colonial rule.
- To Understand economic cause of environmental problem.
- To Understand Indian thinkers and their ideas and contribution in Indian economy.

  
Economics Department



  
Principal

**PRINCIPAL**  
S.E.S.'s S. M. Dadasaheb Limaye  
College, Kalamboli,  
Tal : Panvel, Dist : Raigad.



## Department of Geography

### Programme outcome

Year 2018-19

1. The degree of Bachelor of Arts will encourage first generation learners and impoverished class students to aspire for higher education.
2. Learning and Higher Education is brought within the means of the students who desire for a graduate degree.
3. Languages and social sciences provide a better insight to life. The Bachelor of Arts programme will create awareness about the same amongst the students.
4. Upon completion of this programme, students will stand eligible for post-graduate programmes in Law, Education, Languages, Social Sciences, Social Services and a multitude of other programmes, thereby adding to the educated and skilled workforce of the society.

### Programme Specific Outcome

1. The B. A. Geography programme aims to enhance geographical knowledge and awareness amongst students regarding the present scenario of environmental degradation, climate change, demographic issues, urbanization and other problems affecting the earth.
2. The programme will also empower the students with the skills required to analyse, evaluate and act upon the problems by teaching them the latest techniques like GIS, GPS and Remote Sensing.
3. The programme will encourage students to study further for their post-graduate degree and take up further research in the field of Geography.
4. The programme aims to increase the employability quotient of the students and make them a skilled and educated work-force.





5. Understand the structure, composition of different spheres of the Earth and its Atmosphere.
6. Understand importance of oceans, rivers and water and find ways of their conservation
7. Acquire skills in Map reading and interpretation
8. Understand how to study a region
9. Make use M S Excel in representation of statistical data
10. The Bachelor of Arts programme aims to create an interest for the languages, social sciences and humanities amongst students.

### Course Outcomes

Class	Course	semester	Outcome
FYBA	<b>Physical Geography</b>	I	<ol style="list-style-type: none"> <li>1. Develop interest in landforms around</li> <li>2. Have basic knowledge of processes shaping the Earth's crust.</li> <li>3. Acquire skill to understand basic contour patterns</li> <li>4. Know the landforms seen in areas near by</li> </ol>
	<b>Human Geography</b>	II	<ol style="list-style-type: none"> <li>1. Develop interest in human imprints on Earth</li> <li>2. Understand the concept of resource</li> <li>3. Correlate human activities with geographical setting</li> <li>4. Develop skill of drawing graphs</li> </ol>



S.Y.B.A.	<b>Climatology</b>	III	<ol style="list-style-type: none"> <li>1. Understand the nature of atmosphere</li> <li>2. Better knowledge of distribution of climatic factors on Earth</li> <li>3. Learn processes behind climatic phenomenon occurring around</li> <li>4. Learn to read Weather maps</li> </ol>
	<b>Physical Geography of India</b>	III	<ol style="list-style-type: none"> <li>1. Understand the physiographic setting of India</li> <li>2. Know the water resource potential of India</li> <li>3. Learn about mineral resource richness of India</li> <li>4. Acquire map filling skill</li> <li>5. Learn to draw map scales</li> </ol>
	<b>Oceanography</b>	IV	<ol style="list-style-type: none"> <li>1. Understand the distribution of seas</li> <li>2. Know the nature of sea movements</li> <li>3. Acquire skills of reading Bathymetric and Hydrographic charts</li> </ol>
	<b>Agriculture Geography of India</b>	IV	<ol style="list-style-type: none"> <li>1. Understand the agricultural setting of India</li> <li>2. Know the soil resource potential of India</li> <li>3. Learn about industrial regions of India</li> <li>4. Acquire map filling skill</li> <li>5. Learn to convert map scales</li> </ol>
T.Y.B.A.	<b>Settlement Geography</b>	V	<ol style="list-style-type: none"> <li>1. Understand variety of settlements in rural and urban settings</li> <li>2. Learn changing patterns in urban settlements</li> <li>3. Know the functions settlements perform</li> <li>4. Know the urbanisation in India</li> </ol>
	<b>Population Geography</b>	V	<ol style="list-style-type: none"> <li>1. This course will provide the information on population changes and its impact on Human society and environment.</li> </ol>



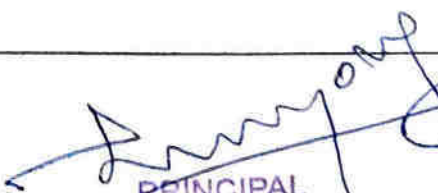
		<ol style="list-style-type: none"> <li>It will also encourage the participation of students in positively influencing their family and society in qualitatively and quantitatively improving the demographic trends.</li> </ol>
<b>Tools and techniques for spatial Analysis_-I</b>	V	<ol style="list-style-type: none"> <li>This course will create awareness about maps, map use and computers.</li> <li>It also empowers their computer knowledge regarding hardware, software and digital cartography.</li> </ol>
<b>Regional Planning and Development</b>	V	<ol style="list-style-type: none"> <li>This course will empower students with the knowledge of regional differences in development of India,</li> <li>Importance of planning and active participation of youth in the process of development and planning.</li> </ol>
<b>Geography of Resources</b>	V	<ol style="list-style-type: none"> <li>This course will enhance student's ability to know about various resources and its utilization.</li> <li>It will also create an understanding about wise utilization of resources and sustainable outlook with a renewable implementation.</li> </ol>
<b>Geospatial Technology</b>	V	<ol style="list-style-type: none"> <li>This course provides extensive knowledge about Remote Sensing and Geographical Information Systems with their recent applications.</li> <li>This paper helps students get oriented with geospatial jobs in the employment market and makes them capable enough to be placed early.</li> </ol>
<b>Environmental Geography</b>	VI	<ol style="list-style-type: none"> <li>This course will make students environmentally aware.</li> <li>Syllabus empowers them to positively change the environment around them by creating wise-developments.</li> </ol>





		3. It also makes them environmentally sensitive to teach the society the values of environment and enact positively for the betterment of the society.
<b>Tourism and Recreation</b>	VI	<ol style="list-style-type: none"> <li>1. This course enables the knowledge of students regarding Travel, Tourism and Recreation.</li> <li>2. It develops their entrepreneurial skills to build a start-up.</li> </ol>
<b>Tools and techniques for spatial Analysis -II</b>	VI	<ol style="list-style-type: none"> <li>1. This course enables students to have knowledge and application of statistics in Geography.</li> <li>2. It interests the students to carry out socio-economic and geographical surveys by utilizing statistical techniques in the research.</li> </ol>
<b>Economic Geography</b>	VI	<ol style="list-style-type: none"> <li>1. This course makes students aware about the economic activities and their linkages with the Geography.</li> <li>2. Syllabus also helps to develop an understanding regarding various economic events in the day-to-day life and its application with a critical outlook.</li> </ol>
<b>Social Geography.</b>	VI	<ol style="list-style-type: none"> <li>1. This course will encourage students to study social issues and became a best citizen .</li> </ol>
<b>Research Metodology</b>	VI	<ol style="list-style-type: none"> <li>1. This course will increase the students' curiosity and cultivate a research streak in them which in turn will be beneficial to the subject as students will take more interest in contributing to the subject matter.</li> </ol>

  
**Head**  
 Department of Geography  
 S. M. D. L. College, Kalamboli.

  
**PRINCIPAL**  
 S. M. Dadasaheb Limaye  
 ACS College, Kalamboli,  
 Tal.- Panvel, Dist. - Raigad.

## **F.Y.B.A. (History) (2018-19)**

**History of Modern India (1857-1947)**

**Semester - I**

The course is designed to make the student aware about the making of modern India and the struggle for independence.

### **SYBA – History Paper-II**

**Landmarks in World History, 1300 A.D.-1945 A.D.**

**SEMESTER-III**

To enable the students to compare and the transition of Europe from medieval to modern times and its impact on the world. To provide accurate knowledge of the most significant events and personalities of the period under study and encourage understanding of the making of the modern world.

### **SYBA History- Paper- III**

**Ancient India from Earliest Times to 1000 A.D.**

**SEMESTER-III**

To acquaint the students with different sources of Ancient Indian History.

To enable the students to understand the political, socio-economic and cultural developments in the period under study and appreciate the rich cultural heritage in India

## **T.Y.B.A. SEMESTER -V**

### **Core Course IV- History of Medieval India (1000 CE-1526CE)**

1. To acquaint the students with the history of early Medieval India that laid the foundation of the Sultanate in India.
2. To study the contribution of Vijayanagar and Bahamani kingdoms to Medieval Indian History.
3. To examine the administrative, socio-economic and cultural aspects of Medieval India.

### **Core Course V- History of Modern Maharashtra (1818 CE-1960 CE)**

1. To acquaint students with regional history.
2. To understand political and socio-economic developments during the 19<sup>th</sup> and 20<sup>th</sup> centuries.
3. To create understanding of the movement that led to the formation of Maharashtra.

### **Core Course VI A – Introduction to Archaeology**

1. To understand the basic facets of Archaeology.
2. To evaluate the importance of Epigraphy.
3. To study the importance of Numismatics as an important source of history.



### **Core Course VII- History of the Marathas (1630 CE – 1707CE)**

1. To introduce the students to the regional history of Maharashtra.
2. To familiarize students with the literary sources of the history of the Marathas.
3. To help students to understand the forces leading to the establishment of Maratha power under Chhatrapati Shivaji Maharaj.

### **Core Course VIII: History of Contemporary World (1945 CE – 2000 CE)**

1. To trace some of the major events of post-World War II period.
2. To understand the significance of these events.
3. To comprehend the ways in which events of the latter half of the twentieth century have influenced the present.

### **Elective Course IX A - Research Methodology and Sources of History**

1. To teach students basics of research methodology in history with a view to promote historical research.
2. To understand the various kinds of sources of history and its interpretation.
3. To acquaint students with the new trends and approaches in history writing.

## **T.Y.B.A. SEMESTER -VI**

### **Core Course: IV- History of Medieval India (1526 CE-1707CE)**

1. To acquaint the students with the history of India since the emergence of the Mughal rule.
2. To understand administration of the Mughal Empire.
3. To study the rise of the Maratha Power.

## **SEMESTER -VI**

### **Core Course V – History of Contemporary India (1947 CE- 2000 CE)**

1. To understand the process of making the Constitution and the Integration and Reorganization of Indian States.
2. To acquaint the students with the political developments in India after Independence.
3. To comprehend the socio-economic changes and progress in science and technology in India.

## **SEMESTER -VI**

### **Elective Course VI A - Introduction to Museology and Archival Science**

1. To inform the students about the role of Museums in the preservation of Heritage.
2. To understand the importance of Archival Science in the study of History.
3. To encourage students to pursue careers in various Museums and Archives in India and abroad.

## **SEMESTER -VI**

### **Core Course VII: History of the Marathas (1707 CE – 1818 CE)**

1. To enable the students to understand the processes that led to the expansion of the Maratha Power.
2. To appreciate the contribution of the Marathas in the national politics of the 18<sup>th</sup> century.
3. To develop an understanding of the society and culture in Maharashtra in the 18<sup>th</sup> century.

## SEMESTER -VI

### Core Course VIII - History of Asia (1945 CE-2000 CE)

- 1.To acquaint the students with some of the major changes that occurred in Asia after World War II.
- 2.To understand the ways in which Asian nations resisted and defied the control of the West.
- 3.To comprehend some of the trends that emerged in Asia.

## SEMESTER -VI

### Elective Course IX A - Research Methodology and Sources of History

1. To teach students basics of research methodology in history with a view to promote historical research.
2. To understand the various kinds of sources of history and its interpretation.
3. To acquaint students with the new trends and approaches in history writing.



A handwritten signature in blue ink, appearing to read "Limaye".

Sign of Principal

Principal,  
College Sea, Kalangoli,  
Tal. Panvel, Dist. Raigad.

Department of Commerce  
Year 2018- 19  
Course Outcome

- 1) To identify solution in maths and stats.
- 2) To solve critical problems in accounting.
- 3) To provide best practices in EVS.
- 4) To know about business and service sector.
- 5) To know specific principles in management and theory of management.
- 6) To provide basic in business communication skill.
- 7) To know about basic practice in business law.
- 8) To provide knowledge in the financial and stock market.
- 9) To you know the basic in marketing and human resource management?
- 10) To provide basic facts in export marketing
- 11) To knowledge about the specific terms in business economics.
- 12) To know theory and practical in taxation.
- 13) To develop skills to operate as an advertising professional in ad agency.
- 14) To get students acquainted with basic concept in GST.
- 15) To get the knowledge in calculation of cost per unit in cost accounting.

*PP Mahajan*  
IQAC

*Shama*  
Head of the Department  
**Head**  
Department of Commerce  
S. M. D. L. College, Kalamboli.

*Ramprasad*  
Principal  
**PRINCIPAL**  
SES's S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal : Panvel, Dist : Raigad.





Department of Commerce  
Year 2018 -19  
Program Outcome

- 1) Specific knowledge about Trade and Commerce
- 2) Information and intelligence in accounting standards and principles.
- 3) Skill enhancement through business communication.
- 4) Calculation of company account.
- 5) Accounting knowledge through cost accounting, management accounting and finance accounting
- 6) Basic information about internal audit ,company audit ,auditing techniques, principles of audit.
- 7) Knowledge about the specific terms in export marketing.
- 8) Legal knowledge in business through the business law.
- 9) Knowledge about stock Market
- 10) Theoretical and practical knowledge through direct and indirect tax.
- 11) Knowledge about basic concepts in marketing.
- 12) Enhance the knowledge in business economics.

PP Mahajan  
IQAC

Sharma  
Head of the Department  
**Head**  
Department of Commerce  
S. M. D. L. College, Kalamboli.

Principal  
**PRINCIPAL**  
SES's S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal : Panvel, Dist : Raigad.



Department of Commerce  
Year 2018 -19  
Program Specific Outcome

- 1) Knowledge about the specific terms in business communication.
- 2) Acquired practical and theoretical knowledge in accounting.
- 3) Knowledge about the principles of management and theory of management
- 4) Knowledge in accounting principles and standards.
- 5) Knowledge in auditing principles and techniques.
- 6) Identify solution in maths and stats.
- 7) Knowledge about the specific terms in business law.
- 8) Knowledge about the basic concepts of capital budgeting , calculation of working capital.
- 9) Learning basic knowledge and practical application in income tax and GST.
- 10) Acquainted students with the various aspects of international trade, foreign exchange market, recent foreign exchange rate policy.

*PP Mahajan*  
IQAC

*Sharma*  
Head of the Department  
**Head**  
Department of Commerce  
S. M. D. L. College, Kalamboli.

*Amrutha*  
Principal  
**PRINCIPAL**  
SES's S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal - Panvel, Dist : Raigad.





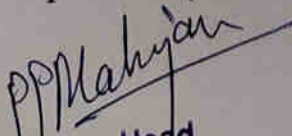
**F.Y.B. Com**  
**Environmental Studies-I**  
**Year 2018-19**

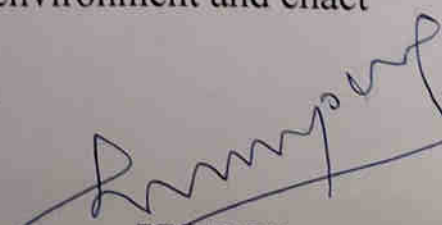
## **Programm Outcome**

1. To increase awareness about environment, ecosystem and resources
2. To encourage students to participate in conservation techniques
3. To introduce students to the concepts of Solid waste management, agricultural and industrial development and environmental management.
4. To increase participation of students in environment protection activities.

## **Course Outcome**

1. This course will make students environmentally aware.
2. It also empowers them to positively change the environment around them by creating wise-developments.
3. This course will empower the students who are environmentally sensitive to teach the society the values of environment and enact positively for the betterment of the society.

  
**Head**  
**Department of Geography**  
**S. M. D. L. College, Kalamboli.**

  
**PRINCIPAL**  
**SES'S B. M. Dadasaheb Limaye**  
**ACS College, Kalamboli,**  
**Tal.- Panvel, Dist. - Raigad.**

**SES'S**  
**SMDL College of Arts, Science & Commerce**  
**Program Outcomes and Course Outcomes : Academic Year : 2018-19**

Name of the Faculty : - Dr. Usha Sainger  
Class :- F.Y B.Sc.  
Sub :- Botany  
Department : Science

### **PROGRAM OUTCOMES**

**USBO101**  
**Plant Diversity**

**Semester- I Theory**  
**Subject- Botany**  
**Paper-I**

### **Course Outcomes**

1. Introduce students to algae and let them explore the diversity in the thallus structure ranging from simple to complex. Learn the taxonomy of Chlorophyta represented by Spirogyra. Also create awareness about the utility of algae in industries like production of nutraceuticals, biofuel green fuel technology.
2. Introduction to fungi from simple Phycomycetes represented by Rhizopus life cycle. Modes of nutrition in fungi and economic importance of fungi to enable students to think about strain selection.
3. Bryophytes amphibious habitat progressing towards land habitat features of bryophytes general characters of Hepaticae and life cycle of widely available Riccia

### **Programme Outcomes:**

- > Understanding the diversity of lower plants, its life cycle, type of chloroplast and application of algae for commercial purposes.
- > Detailed study of fungi life cycle, mode of nutrition and its selection for economic products.
- > Detailed study of bryophytes life cycle, types of thallus and alternation of generations.

**USBO102**  
**Form and Functions**

**Semester I Theory**  
**Subject- Botany**  
**Paper II**

### **Course Outcomes**

1. Introduction to cell Biology ultrastructure of cell wall, plasma membrane, to understand the transport mechanisms via these membranes.
2. To understand the concept of Mendelian inheritance selection of model organisms



. Explanation of monohybrid and dihybrid crosses. Terminologies used in genetics, test cross and backcross.

3. To go beyond Mendelian inheritance and understand the concept of genetic interaction, epistatic interactions, multiple alleles and inheritance of blood groups in man.

### **Programme Outcomes:**

➤ Basic concept of cell and its ultra-microscopic structure of cell organelle

➤ Ecology: Study of flow of energy at different trophic levels. Study of aquatic and terrestrial ecosystems, Ecology: Study of flow of energy at different trophic levels. Study of aquatic and terrestrial ecosystems

➤ Detailed study of Mendelian genetics, multiple alleles and epistatic and non-epistatic interactions. Genetic basis of cultivars.

USBO201  
Plant Diversity I

Semester- II Theory  
Subject- Botany  
Paper I

### **Course Outcomes**

1. Land plants, first vascular plants Pteridophytes. Study of Nephrolepis to understand the stages of life cycle and alternation of generations

2. Gymnosperms identify the characters. Structure life cycle of a commonly grown gymnosperm Cycas to understand the stages of life cycle.

4. Bentham and Hooker's system of classification. Introduction to plant families by study of family Malvaceae and Amaryllidaceae

### **Programme Outcomes:**

➤ Detailed study of first land plants - systematic position, life cycle, and alternation of generations. ➤ Study of Bentham and Hooker's classification for Malvaceae, Amaryllidaceae family.

USBO201  
Form and Functions

Semester II Theory  
Subject- Botany  
Paper-II

### **Course Outcomes**

1. Anatomy of plants, cells, tissues, salient characters of simple and complex tissues. Explain the primary structure of dicot and monocot root, stem and leaf. To allow the students to understand the difference in the anatomy of dicot and monocot, learn to apply this knowledge in identification of isolated plant organs.

2. Study of epidermal outgrowths and stomata of dicot and monocot leaves



Medicinal Botany: To understand the concept of primary and secondary metabolites. Ingredients of grandma's pouch and its medicinal uses.

### Programme Outcomes

- > Detailed study of anatomical structures of plant tissues, root, stem, leaf and types of epidermis
- > Study of difference of primary and secondary metabolites, some medicinal use of secondary products.

USBO101  
Plant Diversity

Semester I & II Practical  
Subject- Botany  
Paper-I

### Course Outcomes:

Experiential learning, identification of algae and fungi by observing them under microscope

1. Experiential learning of mounting and identification with the help of fresh/preserved material and permanent slides of Spirogyra. Vegetative and reproductive lateral and scalariform conjugation.
2. Range of thallus in green algae single cell, coenobium, filamentous, branched, unbranched, parenchymatous.
3. Economic importance of green algae
4. Microscopic observation, mounting and identification of fresh/preserved material and permanent slides of Rhizopus.
5. Material of saprophytic and parasitic fungi to explain the mode of nutrition concept of extracellular enzymes, haustoria.
6. Study of morphological features and internal structure of Riccia with help of fresh /preserved material and permanent slides.

### Programme Outcomes:

Use of microscope, application of technique of microscopy

- > Understanding the diversity of lower plants, its life cycle, type of thallus and chloroplast and application of green algae for commercial purposes.
- > Detailed study of fungi life cycle, mode of nutrition and its selection for economical products.
- Detailed study of bryophytes life cycle, types of thallus and gametophytes.

USBO101  
USBO102

Semester- I Practical  
Subject- Botany  
Paper-I&II

### Course Outcomes:

1. Squash preparation to study various stages of mitosis learning the technique of chromosomal staining observation of stages of cell division.
2. Slide preparation to study types of starch grains in potato, pea and rice. Mounting of aleurone layer from maize grain.
3. Students would take transverse section of Ficus elastica leaf and observe under light microscope to look at cystolith similarly other mineral crystals like raphides and

sphaeraphides would be observed by taking transverse section of Pistia leaf and Opuntia phylloclade respectively. This would enable students to explore the diversity of cell inclusions in plants.

4. Cell organelles would be studied using photomicrographs.

5. Introduction to biostatistics, sampling, central tendency calculation of mean, median and mode, graphical representation of data, frequency polygon, histogram, pie chart. Calculation of standard deviation.

6. Karyotype analysis of human normal male and female and Allium cepa.

7. > Ecological study of plants. Morphological adaptations from terrestrial and aquatic ecosystems.

### Programme Outcomes:

- > Detailed study of different stages of mitosis and cell inclusions.
- > Basic concept and functions of cell organelles.
- > Study the effect of change of pH on colour of anthocyanin pigment and its applications for other natural indicators.
- > Biostatistical analysis of mean, median, mode and standard deviation.
- > Data presentation with the help of frequency distribution, graphical representation of data- frequency polygon, histogram, pie chart.
- > Detailed study of Karyotypes

USBO202  
Paper II  
Form and Function



Semester II Practical-II  
Subject- Botany

### Course Outcomes: Skill development

1. Sectioning of dicot and monocot root, stem and leaves to study the primary structure. Mounting of epidermal outgrowths. Learner would learn the technique of sectioning, staining. Types of epidermal outgrowth and its role in a plant's life cycle.
2. Based on observations of morphological characters plants would be identified as hydrophytes, mesophytes and xerophytes.
3. Simple test for tannin's identification and botanical names of plants in everyday life to cure common ailments and scientific explanation for their curative properties.

### Programme Outcomes:

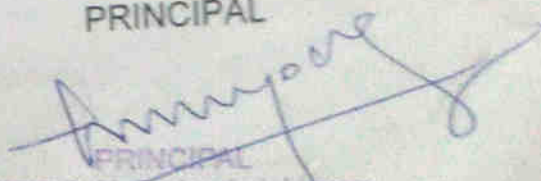
- > Detailed study of anatomical structures of root, stem, leaf, types of stomata and epidermal outgrowths.
- > Assessment of tannins and identification of some medicinal plant products.

  
SUBJECT TEACHER  
IQAC COORDINATOR  




  
HEAD OF DEPARTMENT

PRINCIPAL

  
PRINCIPAL  
SES'S S. M. Dadasahab Limaye  
ACS College, Kalamboli,  
Tal.- Parvel, Dist. - Raigad.



**Class: T.Y.B. Sc. Chemistry Semester V**

**Course (Paper) Name: Drugs**

- CO1 Describe the basic scientific concepts and principles that serve as the foundational underpinnings of the pharmacological sciences including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions; and explain how these fundamental pharmacological properties can influence route of administration, drug action; drug efficacy and potency; drug levels in the body; potential for drug interactions; drug toxicity; and the appropriate choice of drug for pharmacotherapy in a given patient.
- CO2 Explain how to use drug-specific and patient-specific pharmacokinetic parameters to calculate the physiochemical properties that influence rates of drug disposition and clearance in the body, and how these parameters can be used to monitor, design and modify appropriate dosing regimens of drugs in specific patient populations.
- CO3 Describe the process by which new drugs are discovered, developed, tested and finally approved by the Federal Drug Administration for use in the clinic.
- CO4 List the major drugs and drug classes currently used in medical practice.
- CO5 Describe the specific pharmacology of the major drugs and drug classes currently used in medical practice including their indications, contraindications, clinical use, mechanisms of action, physiological effects, pharmacokinetic properties, major adverse effects and clinically significant drug interactions; and apply this knowledge together with both disease specific and patient-specific factors to select the most appropriate medication(s) for the effective pharmacotherapy of a given disease or condition in a specific patient.
- CO6 Recognize the currently accepted diagnostic criteria required to specific diagnose disease and initiate drug therapy and the anticipated therapeutic goals likely to be achieved by therapeutic intervention for the most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements for monitoring drug effectiveness and potential toxicity.
- CO7 Explain the physiological, pharmacological, and psychological effects of acute and chronic exposure of individuals to drugs of abuse, and describe the consequences of sudden withdrawal of such a drug from a drug dependent individual.
- CO8 Describe the effective use of non-pharmacological therapeutic interventions in the treatment of specific diseases, conditions and symptoms.
- CO9 Discuss the basic principles of toxicology; the mechanisms by which excess exposure to certain drugs, toxins, chemicals, heavy metals and poisons can lead to adverse toxicological effects; and the basic principles of clinically managing the poisoned patient.
- CO10 Students will be able to describe the term addiction and explain various theories of causation.
- CO11 Students will be able to Identify and describe different approaches used in the treatment of addictions.

*Dr. S. M. Dadasaheb Limaye*  
Drugs & Dyes



*S. M. Dadasaheb Limaye*  
PRINCIPAL  
Smt. S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal. - Panvel, Dist. - Raigad.



- CO12 Define the routes of administration, methods of ingestion, tolerance, withdrawal and interactions of these drugs with other psychoactive and non-psychoactive drugs.  
CO13 Describe warning sign, symptoms, and the course of substance use disorders.  
CO14 To familiarize the basic classification of drugs  
CO15 To learn about the structure and synthesis of antibiotics

**Practical's CO1** Students can able to do the syntheses of simple drugs i.e. aspirin

CO2 Students can able to perform estimation of Ibuprofen.

CO3 Students can able to find out acid neutralizing capacity of antacid.

CO4 Students can able to do the separation of chlorophyll pigment.

CO5 Students able to do the dyeing of cotton.

CO6 Students can able to write monogram of any drug.

## Semester VI

### Course {Paper} Name: Drugs

CO1 Describe the basic scientific concepts and principles that serve as the foundational underpinnings of the pharmacological sciences including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions; and explain how these fundamental pharmacological properties can influence route of administration, drug action; drug efficacy and potency; drug levels in the body; potential for drug interactions; drug toxicity; and the appropriate choice of drug for pharmacotherapy

CO2 Explain how to use drug-specific and patient-specific pharmacokinetic parameters to calculate the physiochemical properties that influence rates of drug disposition and clearance in the body, and how these parameters can be used to monitor, design and modify appropriate dosing regimens of drugs in specific patient populations.

CO3 Describe the process by which new drugs are discovered, developed, tested and finally approved by the Federal Drug Administration for use in the clinic.

CO4 List the major drugs and drug classes currently used in medical practice.

CO5 Describe the specific pharmacology of the major drugs and drug classes currently used in medical practice including their indications, contraindications, clinical use, mechanisms of action, physiological effects, pharmacokinetic properties, major adverse effects and clinically significant drug interactions; and apply this knowledge together with both disease specific and patient-specific factors to select the most appropriate medication(s) for the effective pharmacotherapy of a given disease or condition in a specific patient.

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CO6 Recognize the currently accepted diagnostic criteria required to specific diagnose disease and initiate drug therapy and the anticipated therapeutic goals likely to be achieved by therapeutic intervention for the most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements for monitoring drug effectiveness and potential toxicity.

CO7 Explain the physiological, pharmacological, and psychological effects of acute and chronic exposure of individuals to drugs of abuse, and describe the consequences of sudden withdrawal of such a drug from a drug dependent individual.

CO8 Describe the effective use of non-pharmacological therapeutic interventions in the treatment of specific diseases, conditions and symptoms.

CO9 Discuss the basic principles of toxicology; the mechanisms by which excess exposure to certain drugs, toxins, chemicals, heavy metals and poisons can lead to adverse toxicological effects; the basic principles of clinically managing the poisoned patient.

CO10. Students will be able to describe the term addiction and explain various theories of causation.

CO11 Students will be able to Identify and describe different approaches used in the treatment of addictions.

CO12 Define the routes of administration, methods of ingestion, tolerance, withdrawal and interactions of these drugs with other psychoactive and non-psychoactive drugs.

CO13 Describe warning sign, symptoms, and the course of substance use disorders.

CO14 To familiarize the basic classification of drugs

CO15 To learn about the structure and synthesis of antibiotics

#### Practical's

CO1 Students can able to do the syntheses of simple drugs i.e aspirin

CO2 Students can able to perform estimation of Ibuprofen.

CO3 Students can able to find out acid neutralizing capacity of antacid.

CO4 Students can able to do the separation of chlorophyll pigment.

CO5 Students able to do the dyeing of cotton.

CO6 Students can able to write monogram of any drug.

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## Department of Chemistry

### Programme Specific Outcomes

- PSO1 The students will have sound understanding of fundamental and application based principles and theories in Physical, Inorganic, Organic and Analytical Chemistry
- PSO2 Students will learn various techniques to perform scientific experiments as well as accurately record and analyse the results of such experiments
- PSO3 Student will learn the usage of analytical instruments, select, and apply appropriate techniques and resources for the analysis
- PSO4 Extensive laboratory and classroom work will skill the students with in problem solving, critical thinking and analytical reasoning as applied to scientific problems
- PSO5 Students will be acquainted with new areas in both chemistry and allied fields of science and technology
- PSO6 Students will understand the applications and impact of the chemistry in societal, and environmental contexts, and demonstrate it's knowledge and need for sustainable Development
- PSO7 Students will learn to apply ethical practices such as limited and safe use of hazardous chemicals, responsibility toward environmental and health safety
- PSO8 Students will be able to work in team and thus get prepared as a perfect professional chemist with respect to knowledge, responsibility and teamwork



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**Course Outcomes**  
**Class: F.Y.B. Sc. Chemistry**

**Semester I**

**Course {Paper} Name and No.: Paper I Inorganic**

- CO1 Learn Rutherford atomic model and bohr theory with its limitation.
- CO2 Describe the structure of hydrogen atom .
- CO3 Explain hydrogen energy levels, shells , subshells and orbitals.
- CO4 Explain shielding effect and effective nuclear charge .
- CO5 Understand Aufbau principle.
- CO6 Classify the elements as the main group, transition and inner transition elements.
- CO7 Explain periodicity in properties for atomic and ionic size.
- CO8 Describe electron gain enthalpy and ionization enthalpy.
- CO9 Describe electronegativity by pauling, mulliken and Alfred rochow method

**Course (Paper) Name and No.: Paper II**

- CO1 Explain what is mean by main group elements.
- CO2 Learn and explain metallic and non metallic nature of main group elements.
- CO3 Understands the concept of electronegativity of main group elements
- CO4 Learn about what is mean by anomalous behavior and anomalous behavior of second period elements.
- CO5 Understands and explain allotropic modifications of group — 14, 15 and 16 elements
- CO6 Learn about the concept of diagonal relationship between 2nd period elements and 3rd period elements.
- CO7 Get the knowledge about chemistry of carbides, oxides and hydrides of group I and group II elements.
- CO8 Learn and explain the preparation, prcperities and uses of some important compounds like  $\text{NaHCO}_3$ ,  $\text{Na}_2\text{CO}_3$ ,  $\text{NaCl}$ ,  $\text{NaOH}$ ,  $\text{CaO}$  and  $\text{CaCO}_3$ ,
- CO9 Know the general environmental aspects of oxides of carbon, oxides and oxyacids of sulphur and nitrogen.
- CO10 Get the knowledge about Photochemical smog, Acid rain, Global warming its control techniques and health hazards.

**Course {Paper} Name and No.: Practical**

- CO1 Determine the strength of  $\text{Na}_2\text{CO}_3$  and  $\text{NaHCO}_3$  in a solution of two by titration with standard acid.
- CO2 Determine the strength of commercial sample of acid.
- CO3 Calculate and report the amount of acetic acid an Organic acid sample by titrimetric method
- CO4 Determine the percentage purity of  $\text{ZnO}$  containing  $\text{ZnCO}_3$ .

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CO5 Determine the percentage purity of  $BaSO_4$  containing  $NH_4Cl$ .

## Semester II

### Course (Paper) Name and No.: Paper I Inorganic

CO1 describe concept of qualitative analysis like precipitation equilibria, common ion effect etc.

CO2 describe introductory part of coordination compounds as well as terminology in coordination compounds.

CO3 classify the ligands.

CO4 describes Arrhenius, Lowry bronsted, Solvent — Solute concept of acids-bases.

CO5 explain hard and soft acids and bases with applications.

CO6 understand mechanism of organic reactions like friedel acylation / alkylation.

CO7 explain calculations of titration curve involving strong acid and strong base.

### Course (Paper) Name and No.: Paper II

CO1 Explain the types of chemical bonds and can do the comparison between ionic and covalent bonds.

CO2 Define polarizability ( Fajan's rule ) and can understands the shapes of molecules.

CO3 Draw the Lewis dot structure

CO4 Explain the Sidgwick Powell Theory and basic VSEPR theory for  $AB_n$  type molecules with and without lone pair of electrons

CO5 Understands the isoelectronic principles, applications and limitations of VSEPR theory.

CO6 Understands the concept of Reduction potentials: half reactions, balancing redox reactions

CO7 Explain Redox stability in water by: i) Latimer and Frost diagrams ii) pH dependence of redox potentials.

CO8 Understands the applications of redox chemistry like :

i) extraction of elements (example : isolation of copper by auto reduction)

ii) redox reagents in volumetric analysis  $I_2$  and  $KMnO_4$

iii) titration curves: i) single electron system ii) multi electron system

### Course (Paper) Name and No.: Practical

CO1 Analysis qualitatively cations and anions from a sample.

CO2 To determine the percentage of copper (II) present in a given sample by titration.

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## Semester IV

### Course {Paper} Name and No.: General Chemistry I inorganic

- CO1 learn the position of transition metals in the periodic table; natural occurrence principal ores and minerals
- CO2 Know the electronic configurations of transition elements
- CO3 Appreciate the relative stability of various oxidation states in terms of electrode potential values
- CO4 Describe Origin of colour for transition metals and their compounds
- CO5 Explain magnetic properties of transition metal compounds
- CO6 Describe the Chemistry of Titanium and vanadium with respect to occurrence, extraction and properties of Oxides and chlorides
- CO7 Understand its use in titrimetric analysis
- CO8 Understand the qualitative tests for various transition metal ions-1st transition series
- CO9 Know the meaning of basic terms in Coordination Chemistry
- CO10 Explain Types of ligands,
- CO11 Explain characteristics of complex ions
- CO12 Learn the rules of nomenclature of coordination compounds.
- CO13 Write the rules formulas and names of coordination compounds
- CO14 Define different Types of isomerism in coordination compounds
- CO15 Understand the nature of bonding in coordination compounds in terms of VBT
- CO16 Appreciate the importance and applications of coordination compounds in our day to day life
- CO17 Appreciate the postulates of Werner's coordination theory;
- CO18 Explain EAN rule and eighteen electron rule;
- CO19 Distinguish inner orbital complexes and outer orbital complexes

### Course {Paper} Name and No.: General Chemistry-II

- CO1 Explain concept of hydration of anions with respect to effect of charge and radius.
- CO2 Explains physical properties of concentrated oxoacids.
- CO3 Describes uses and environment aspects of concentrated acids like sulfuric acid, nitric acid and phosphoric acid.

### Course {Paper} Name and No.: Practical

#### Paper II: Inorganic Chemistry

- CO1 Compare Inorganic preparat ion -Nickel dimethyl glyoxime using microscale method
- CO2 Understand Complex cation - Tris (ethylene diamine) nickel (II) thiosulphate
- CO3 Discuss Complex anion - Sodium Hexanitrocobaltate (III) The aim of this experiment is to understand the preparation of a soluble cation (sodium) and a large anion hexanitrocobaltate(III) and its use to precipitate a large cation (potassium)
- CO4 Understand practical aspect of Preparation Inorganic salt - Calcium or magnesium oxalate using PFHS technique

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**Class: T.Y.B. Sc. Chemistry**

**Course (Paper) Name: Inorganic Chemistry**

- CO1 describe molecular symmetry and concept of point group
- CO2 explain different types of point group with examples
- CO3 Appreciate importance of symmetry in chemistry
- CO4 Explain lattice energy and factors affecting lattice energy
- CO5 Assign the point group for given molecule
- CO6 Describe molecular orbital theory of heteronuclear diatomic molecules
- CO7 Compare homonuclear and heteronuclear diatomic molecules
- CO8 Understand application of molecular orbital theory to poly atomic species
- CO9 Explain important terms viz. crystal lattice, lattice point, unit cell and lattice constants;
- CO10 Explain seven basic crystal systems
- CO11 Explain closest packing of rigid spheres and different types of closest packing of rigid spheres
- CO12 Calculate the packing density of different types of cubic unit cells
- CO13 Describe the imperfections in solids and their effect on properties
- CO14 Explain consequences of frenkel and schottky defects and differentiate them;
- CO15 Explain the terms superconductivity, transition temperature and meissner effect;
- CO16 Explain different types of super conductors
- CO17 Give application of superconductors;

**Semester VI**

**Course (Paper) Name and No.: Inorganic Chemistry**

- CO1 Explain merits and Limitations of Valence Bond Theory.
- CO2 Explain the shapes of d- orbitals
- CO3 Explain the basic concepts of Crystal Field Theory
- CO4 Explain the Splitting of d orbitals in different geometries;
- CO5 Calculate Crystal field stabilization energy (CFSE), for octahedral complexes
- CO6 Describe Distortions from the octahedral geometry
- CO7 Crystal field splitting parameters  $\Delta$ : its calculation and factors affecting it in octahedral complexes, Spectrochemical series.
- CO8 Explain Consequences of crystal field splitting on various properties of metal complexes of the first transition series.
- CO9 Explain Limitations of CFT ;
- CO10 Explain Evidences for covalence in metal complexes
- CO11 Understand Molecular Orbital Theory for coordination compounds:
- CO12 Identify the central metal orbitals and their symmetry Suitable for formation of 6 bonds with ligand orbitals.

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- CO13 Construct ligand group orbitals
- CO14 Construct- 6 molecular orbitals for an ML6 complex
- CO15 Explain Effect of n-bonding on complexes
- CO16 Understand Thermodynamic and kinetic stabilities of metal complexes;
- CO17 Explain Stability constants: stepwise, overall stability constants, their interrelationship.
- CO18 Explain Factors affecting thermodynamic stability of complexes .
- CO19 Compare Inorganic and organic reactions
- CO20 Explain Types of reactions in metal complexes.
- CO21 Describe Inert and labile complexes ;
- CO22 Correlate electronic configurations and stability of complexes.
- CO23 Explain Ligand substitution reactions considering Associative and Dissociative mechanisms.
- CO24 Explain Acid hydrolysis, base hydrolysis and anation reactions
- CO25 Describe origin of electronic spectra
- CO26 Describe the different types of electronic transitions in coordination compounds:
- CO27 Learn the Selection rules for electronic transitions.
- CO28 Appreciate rules for determination of ground state term.
- CO29 Determine Terms for p2 and d1 electronic configurations

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Science, Kalamboli.**


**Year:-2018-2019**

**Department of Chemistry**

**Programme Specific Outcomes**

- PSO1 The students will have sound understanding of fundamental and application based principles and theories in Physical, Inorganic, Organic and Analytical Chemistry
- PSO2 Students will learn various techniques to perform scientific experiments as well as accurately record and analyse the results of such experiments
- PSO3 Student will learn the usage of analytical instruments, select, and apply appropriate techniques and resources for the analysis
- PSO4 Extensive laboratory and classroom work will skill the students with in problem solving, critical thinking and analytical reasoning as applied to scientific problems
- PSO5 Students will be acquainted with new areas in both chemistry and allied fields of science and technology
- PSO6 Students will understand the applications and impact of the chemistry in societal, and environmental contexts, and demonstrate it's knowledge and need for sustainable Development
- PSO7 Students will learn to apply ethical practices such as limited and safe use of hazardous chemicals, responsibility toward environmental and health safety
- PSO8 Students will be able to work in team and thus get prepared as a perfect professional chemist with respect to knowledge, responsibility and teamwork



  
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Science, Kalamboli.

Year:-2018-2019

Department of Chemistry

Department of Chemistry After successful completion of three year degree program  
in Chemistry a student should be able to;

### Programme Outcomes

**PO-1.** Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.

**PO-2.** Solve the problem and also think methodically, independently and draw a logical conclusion.

**PO-3.** Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

**PO-4.** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

**PO-5.** Find out the green route for chemical reaction for sustainable development.

**PO-6.** To inculcate the scientific temperament in the students and outside the scientific community.

**PO-7.** Use modern techniques, decent equipment's and Chemistry software's



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Science, Kalamboli.

Year:-2018-2019

Department of Chemistry  
Course Outcomes

Class: F.Y.B. Sc. Chemistry  
Semester I

Course {Paper} Name and No.: Paper I Inorganic

- CO1 Learn Rutherford atomic model and Bohr theory with its limitation.
- CO2 Describe the structure of hydrogen atom.
- CO3 Explain hydrogen energy levels, shells, subshells and orbitals.
- CO4 Explain shielding effect and effective nuclear charge.
- CO5 Understand Aufbau principle.
- CO6 Classify the elements as the main group, transition and inner transition elements.
- CO7 Explain periodicity in properties for atomic and ionic size.
- CO8 Describe electron gain enthalpy and ionization enthalpy.
- CO9 Describe electronegativity by Pauling, Mulliken and Alfred Rochow method

Course (Paper) Name and No.: Paper II

- CO1 Explain what is meant by main group elements.
- CO2 Learn and explain metallic and non-metallic nature of main group elements.
- CO3 Understands the concept of electronegativity of main group elements
- CO4 Learn about what is meant by anomalous behavior and anomalous behavior of second period elements.
- CO5 Understands and explain allotropic modifications of group — 14, 15 and 16 elements
- CO6 Learn about the concept of diagonal relationship between 2nd period elements and 3rd period elements.
- CO7 Get the knowledge about chemistry of carbides, oxides and hydrides of group I and group II elements.
- CO8 Learn and explain the preparation, properties and uses of some important compounds like  $\text{NaHCO}_3$ ,  $\text{Na}_2\text{CO}_3$ ,  $\text{NaCl}$ ,  $\text{NaOH}$ ,  $\text{CaO}$  and  $\text{CaCO}_3$ ,
- CO9 Know the general environmental aspects of oxides of carbon, oxides and oxyacids of sulphur and nitrogen.
- CO10 Get the knowledge about Photochemical smog, Acid rain, Global warming its control techniques and health hazards.

Course {Paper} Name and No.: Practical

- CO1 Determine the strength of  $\text{Na}_2\text{CO}_3$  and  $\text{NaHCO}_3$  in a solution of two by titration with standard acid.
- CO2 Determine the strength of commercial sample of acid.



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CO3 Calculate and report the amount of acetic acid in an Organic acid sample by titrimetric method

CO4 Determine the percentage purity of ZnO containing ZnCO<sub>3</sub>.

CO5 Determine the percentage purity of BaSO<sub>4</sub> containing NH<sub>4</sub>Cl.

#### Semester II

##### Course (Paper) Name and No.: Paper I Inorganic

CO1 describe concept of qualitative analysis like precipitation equilibria, common ion effect etc.

CO2 describe introductory part of coordination compounds as well as terminology in coordination compounds.

CO3 classify the ligands.

CO4 describes Arrhenius, Lowry Bronsted, Solvent — Solute concept of acids-bases.

CO5 explain hard and soft acids and bases with applications.

CO6 understand mechanism of organic reactions like Friedel-Crafts acylation / alkylation.

CO7 explain calculations of titration curve involving strong acid and strong base.

##### Course (Paper) Name and No.: Paper II

CO1 Explain the types of chemical bonds and can do the comparison between ionic and covalent bonds.

CO2 Define polarizability (Fajan's rule) and can understand the shapes of molecules.

CO3 Draw the Lewis dot structure

CO4 Explain the Sidgwick-Powell Theory and basic VSEPR theory for AB<sub>n</sub> type molecules with and without lone pair of electrons

CO5 Understands the isoelectronic principles, applications and limitations of VSEPR theory.

CO6 Understands the concept of Reduction potentials: half reactions, balancing redox reactions

CO7 Explain Redox stability in water by: i) Latimer and Frost diagrams ii) pH dependence of redox potentials.

CO8 Understands the applications of redox chemistry like:

i) extraction of elements (example: isolation of copper by auto-reduction)

ii) redox reagents in volumetric analysis I<sub>2</sub> and KMnO<sub>4</sub>

iii) titration curves: i) single electron system ii) multi electron system

##### Course (Paper) Name and No.: Practical

CO1 Analyze qualitatively cations and anions from a sample.

CO2 To determine the percentage of copper (II) present in a given sample by titration.



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Class: S.Y.B. Sc. Chemistry  
Semester

**III Course (Paper) Name and No.: General Chemistry - I**

- CO1 Explain Ionic Bonding and conditions for formation of ionic bond;
- CO2 Explain Types of ionic crystals with examples,
- CO3 Apply Radius ratio rule in structure determination;
- CO4 Explain Lattice energy and factors affecting Lattice energy;
- CO5 Calculate Lattice energy using Born-Lande equation and Kapustinskii equation,
- CO6 Represent Born-Haber cycle for the formation of ionic bond;
- CO7 Appreciate Importance of Born-Haber cycle
- CO8 Explain the Valence Bond approach for the formation of covalent bond;
- CO9 Appreciate postulates of Valence Bond theory;
- CO10 Describe formation of  $H_2$  molecule and potential energy curve;
- CO11 Explain the formation of mononuclear diatomic molecules;
- CO12 Define the term resonance and give conditions for resonance;
- CO13 Understand the concept of formal charge;
- CO14 Explain the different types of hybridisation and draw shapes of simple covalent molecules;
- CO15 Understand equivalent and non-equivalent hybrid orbitals;
- CO16 Compare atomic orbitals and molecular orbitals
- CO17 Understand linear combination of atomic orbitals

**Course (Paper) Name and No.: General Chemistry-II**

- CO1 Explain preparation of simple boranes.
- CO2 Describe structure and bonding in diborane and tetraborane.
- CO3 Explain synthesis of borax.
- CO4 Describe occurrence, structure and inertness of  $SiO_2$ .
- CO5 Prepare silicon tetrachloride and describe its structure.
- CO6 Explain occurrence and extraction of Germanium.
- CO7 Explain concept of preparation of extra pure Silicon or Germanium.
- CO8 Explain trends in chemical reactivity.
- CO9 Describes Bosch - Haber process for synthesis of ammonia.

**Course (Paper) Name and No.: Practical**

- CO1 Paper II: Inorganic Chemistry Discuss Identification of cations in a given mixture and Analytically separating them [From a mixture containing not more than two of the following:  $Pb(II)$ ,  $Ba(II)$ ,  $Ca(II)$ ,  $Sr(II)$ ,  $Cu(II)$ ,  $Cd(II)$ ,  $Mg(II)$ ,  $Zn(II)$ ,  $Fe(II)$ ,  $Fe(III)$ ,  $Ni(II)$ ,  $Co(II)$ ,  $Al(III)$ ,  $Cr(III)$ ]



CO2 Understand practical aspect of Preparation Crystallisation of potassium iodate and to estimate its purity before and after the separation.

CO3 Appreciate Estimation of total hardness

CO4 Describe. Investigation of the reaction between Copper sulphate and Sodium Hydroxide (Standard EDTA solution to be provided to the learner).

#### Semester IV

#### Course {Paper) Name and No.: General Chemistry I inorganic

CO1 learn the position of transition metals in the periodic table; natural occurrence principal ores and minerals

CO2 Know the electronic configurations of transition elements

CO3 Appreciate the relative stability of various oxidation states in terms of electrode potential values

CO4 Describe Origin of colour for transition metals and their compounds

CO5 Explain magnetic properties of transition metal compounds

CO6 Describe the Chemistry of Titanium and vanadium with respect to occurrence, extraction and properties of Oxides and chlorides

CO7 Understand its use in titrimetric analysis

CO8 Understand the qualitative tests for various transition metal ions-1st transition series

CO9 Know the meaning of basic terms in Coordination Chemistry

CO10 Explain Types of ligands,

CO11 Explain characteristics of complex ions

CO12 Learn the rules of nomenclature of coordination compounds.

CO13 Write the rules formulas and names of coordination compounds

CO14 Define different Types of isomerism in coordination compounds

CO15 Understand the nature of bonding in coordination compounds in terms of VBT CO16

Appreciate the importance and applications of coordination compounds in our day to day life

CO17 Appreciate the postulates of Werner's coordination theory;

CO18 Explain EAN rule and eighteen electron rule;

CO19 Distinguish inner orbital complexes and outer orbital complexes

#### Course {Paper) Name and No.: General Chemistry-II

CO1 Explain concept of hydration of anions with respect to effect of charge and radius.

CO2 Explains physical properties of concentrated oxoacids.

CO3 Describes uses and environment aspects of concentrated acids like sulfuric acid, nitric acid and phosphoric acid.

#### Course {Paper) Name and No.: Practical

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**Paper II: Inorganic Chemistry**

- CO1 Compare Inorganic preparation - Nickel dimethyl glyoxime using microscale method
- CO2 Understand Complex cation - Tris (ethylene diamine) nickel (II) thiosulphate
- CO3 Discuss Complex anion - Sodium Hexanitrocobaltate (III) The aim of this experiment is to understand the preparation of a soluble cation (sodium) and a large anion hexanitrocobaltate(III) and its use to precipitate a large cation (potassium)
- CO4 Understand practical aspect of Preparation Inorganic salt - Calcium or magnesium oxalate using PFHS technique



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Science, Kalamboli.

**Class: T.Y.B. Sc. Chemistry**

**Course (Paper) Name: Inorganic Chemistry**

- CO1 describe molecular symmetry and concept of point group
- CO2 explain different types of point group with examples
- CO3 Appreciate importance of symmetry in chemistry
- CO4 Explain lattice energy and factors affecting lattice energy
- CO5 Assign the point group for given molecule
- CO6 Describe molecular orbital theory of heteronuclear diatomic molecules
- CO7 Compare homonuclear and heteronuclear diatomic molecules
- CO8 Understand application of molecular orbital theory to poly atomic species
- CO9 Explain important terms viz. crystal lattice, lattice point, unit cell and lattice constants;
- CO10 Explain seven basic crystal systems
- CO11 Explain closest packing of rigid spheres and different types of closest packing of rigid spheres
- CO12 Calculate the packing density of different types of cubic unit cells
- CO13 Describe the imperfections in solids and their effect on properties
- CO14 Explain consequences of frenkel and schottky defects and differentiate them; CO15 Explain the terms superconductivity, transition temperature and meissner effect; CO16 Explain different types of super conductors
- CO17 Give application of superconductors;

**Semester VI**

**Course {Paper) Name and No.: Inorganic Chemistry**

- CO1 Explain merits and Limitations of Valence Bond Theory.
- CO2 Explain the shapes of d- orbitals
- CO3 Explain the basic concepts of Crystal Field Theory
- CO4 Explain the Splitting of d orbitals in different geometries;
- CO5 Calculate Crystal field stabilization energy (CFSE), for octahedral complexes
- CO6 Describe Distortions from the octahedral geometry
- CO7 Crystal field splitting parameters  $\Delta$ : its calculation and factors affecting it in octahedral complexes, Spectrochemical series.
- CO8 Explain Consequences of crystal field splitting on various properties of metal complexes of the first transition series.
- CO9 Explain Limitations of CFT ;
- CO10 Explain Evidences for covalence in metal complexes




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- CO11 Understand Molecular Orbital Theory for coordination compounds:
- CO12 Identify the central metal orbitals and their symmetry Suitable for formation of 6 bonds with ligand orbitals.
- CO13 Construct ligand group orbitals
- CO14 Construct- 6 molecular orbitals for an ML<sub>6</sub> complex
- CO15 Explain Effect of  $\pi$ -bonding on complexes
- CO16 Understand Thermodynamic and kinetic stabilities of metal complexes;
- CO17 Explain Stability constants: stepwise, overall stability constants, their interrelationship.
- CO18 Explain Factors affecting thermodynamic stability of complexes .
- CO19 Compare Inorganic and organic reactions
- CO20 Explain Types of reactions in metal complexes.
- CO21 Describe Inert and labile complexes ;
- CO22 Correlate electronic configurations and stability of complexes.
- CO23 Explain Ligand substitution reactions considering Associative and Dissociative mechanisms.
- CO24 Explain Acid hydrolysis, base hydrolysis and anation reactions
- CO25 Describe origin of electronic spectra
- CO26 Describe the different types of electronic transitions in coordination compounds:
- CO27 Learn the Selection rules for electronic transitions.
- CO28 Appreciate rules for determination of ground state term.
- CO29 Determine Terms for p<sup>2</sup> and d<sup>1</sup> electronic configurations



  
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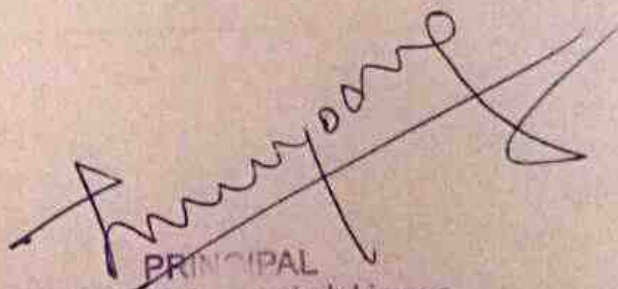
**Year:-2018-2019**

**Department of Chemistry**

**Programme Specific Outcomes**

- PSO1 The students will have sound understanding of fundamental and application based principles and theories in Physical, Inorganic, Organic and Analytical Chemistry
- PSO2 Students will learn various techniques to perform scientific experiments as well as accurately record and analyse the results of such experiments
- PSO3 Student will learn the usage of analytical instruments, select, and apply appropriate techniques and resources for the analysis
- PSO4 Extensive laboratory and classroom work will skill the students with in problem solving, critical thinking and analytical reasoning as applied to scientific problems
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PRINCIPAL  
SES'S S. M. Dadasaheb Limaye  
ACS College, Kalamboli,  
Tal.- Panvel, Dist. - Raigad.



SSE's

Shikshan Maharsi Dadasaheb Limaye College of Arts, Commerce &  
Science, Kalamboli.

Year: 2018-2019

Department of Chemistry

Department of Chemistry After successful completion of three year degree program  
in Chemistry a student should be able to;

### Programme Outcomes

**PO-1.** Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.

**PO-2.** Solve the problem and also think methodically, independently and draw a logical conclusion.

**PO-3.** Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

**PO-4.** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

**PO-5.** Find out the green route for chemical reaction for sustainable development.

**PO-6.** To inculcate the scientific temperament in the students and outside the scientific community.

**PO-7.** Use modern techniques, decent equipment's and Chemistry software's

SMDL COLLEGE , KALAMBOLI

DEPARTMENT OF CHEMISTRY

COURSE OUTCOME OF physical chemistry 2018-2019

FYBSc

Semester 1

Course name & No.

paper1 UNIT1

- CO 1. Explain all basic concepts of thermodynamics like enthalpy , entropy , internal energy etc
- CO 2. Understand all laws with examples
- CO .3 Solve numericals
- CO .4 Explain importance of Chemical Calculations
- CO .5 Explain all basic formulae & their relation with its unit.
- CO 6. Solve various numerical.

Paper2 UNIT1

- CO 1. Explain importance of kinetic in chemical reaction.
- CO .2 Understand how to find order & molecularity of reaction
- CO.3 Understand all derivation with graph
- CO .4 Solve each type of numerical
- CO .5 Introduce some basic concept in liquid state like surface tension , viscosity etc
- CO .6 Understand how to measure viscosity , refractive index
- CO. 7 Understand liquid crystal with application

Semester2

Course name & No..

Paper1 UNIT 1

- CO .1 Introduce gaseous state then explain all related laws
- CO 2. Derive various equation & solve numerical
- CO 3. Explain importance of chemical & thermodynamic equilibrium
- CO. 4 Understand lechatelliar principle & factor affecting the equilibrium.
- CO. 5 Understand 2<sup>nd</sup> law of thermodynamics with concept like entropy & its relation with examples

Paper2 UNIT1

- CO .1 Introduce importants of ionic equilibrium with its type



- CO.2 Derive the relation & explain all about buffer
- CO .3 Introduce important of spectroscopy
- CO 4. Understand its types all formulae & solve numerical
- CO 5. Introduce solid state with types and examples
- CO 6. Understand all related laws.

**Practical**

1. Prepare 2 different concentration solution .
2. Determine rate constant & enthalpy of dissolution of salt .
3. Determine dissociation constant of weak acid & verify Beer-Lambert's law
4. standardize commercial sample of HCl using borax

SMDL COLLEGE , KALAMBOLI

DEPARTMENT OF CHEMISTRY

SYBSc

Semester3

Course name & No.

Paper1 UNIT1

- CO.1 introduce basic thermodynamic
- CO .2 understand helmoltz free energy & derive different equation
- CO. 3 understand molal properties & its variation with temperature & pressure
- CO 4. understand fugacity & activity
- CO 5. solve various numerical
- CO. 6 introduce electrochemistry with all basic formulae
- CO .7 understand affecting factors, its various application
- CO. 8 understand transference number with numerical

paper2 UNIT 1

- CO 1. introduce all basic concept of chemical kinetic with numerical.
- CO.2 See the types of reaction with examples
- CO.3 Understand various theory & compare them
- CO. 4 Introduce solution & ideal solution
- CO.5 Understand raoult's law & its derivation with examples
- CO.6 Understand miscibility of liquid with example
- CO. 7 Understand Nernst law, water system

**Practical**

10. Verify ostwalds dilution law
11. Determine dissociation constant , energy of activation ,solubility
12. Investigate 2 different reaction

Semester 4

Course name & No.

Paper1 UNIT 1

- CO1 Introduce various types of cells
- CO. 2 Understand Nernst equation & its importance with example
- CO.3 Understand liquid junction potential & its affects
- CO.4 Understand use of salt bridge & solve various numerical
- CO. 5 Introduce phase ,components , degree of freedom , gibbs rule
- CO. 6 Derive clausis clapeyron equation with numerical
- CO. 7 Understand phase diagram , 2 components system

Paper2 UNIT 1

- CO. 1 Introduce solid state with crystallography laws & their characteristic
- CO. 2 Understand brags equation with different method
- CO.3 Understand catalysis specificity with mechanism & kinetic
- CO.4 Understand effect of particle size & efficiency of nanoparticles

Practical

1. Determine standard emf & free energy change
2. Compare strength of 2 different solution

SMDL COLLEGE , KALAMBOLI

DEPARTMENT OF CHEMISTRY

TYBSc

Semester 5

Course name & No. physical chemistry

Paper1

- CO. 1. Introduce al basic concept of spectroscopy.
- CO.2 Introduce all types spectroscopy
- CO.3 Understand how to find dipole moment inertia , energy, isotopic shift & sole problem
- CO. 4 Introduce vibrational, rotational , raman spectroscopy with its application & use
- CO.5 Introduce all colligative properties of thermodynamoics & understand them
- CO.6 Derive different derivation of elevation, depression properties introduce osmotic pressure with its derivation
- CO.7 Understand collision theory & its application



- CO.8 Understand stop flow method & flash photolysis.
- CO. 9 Understand all basic concept of nuclear chemistry
- CO.10 Understand importance of halflife period
- CO.11 Understand artificial radioactivity , threshold energy, with application
- CO.12 Introduce difference between absorption & adsorption with examples
- CO.13 Explain types of colloidal solution
- CO.14 Understand all derivation like BET,
- CO. 15 Understand electrical properties of colloidal solution , surfactants & its application.

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**Practical**

1. Analyte various instrumental & non instrumental experiment .
2. Interpret order of reaction, investigate how to do adsorption process
3. Determine standard reduction potential , solubility product , velocity constant , dissociation constant

**Semester 6**

Course name & No. :physical chemistry

- CO.1. Introducing electrochemistry see importance of activity & activity coefficient
- CO.2 Understand Debye Huckel limiting law
- CO.3 Understand chemical cell with transference & non transference
- CO.4 Understand concentration cell with its types & examples
- CO.5 Understand polarization , overvoltage Tafel equation with examples
- CO.6 Introduce all basic terms of polymers with classification
- CO.7 Determine molar mass of polymers with different techniques
- CO.8 Understand stabilizers antistatic agents
- CO.9 Introduce all basic concept QUANTUM

**PRATICAL**

1. determine the energy of activation for the acid catalyzed hydrolysis of methyl acetate.
2. determine the molecular weight of high polymer polyvinyl alcohol (PVA) by viscosity measurement.
3. determine acidic and basic dissociation constant of amino acid and hence calculate isoelectric point.
4. determine the amount of weak acid and strong acid in the given mixture by conductometric titration.
5. determine the solubility and solubility product of AgCl potentiometrically using chemical cell.



*(Signature)*  
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## Department of Computer Science (2018-19)

### Program Outcomes

Serial No.	Course	
1	Program Outcomes	Mainly focus on the basic knowledge about the programming language. Apply the knowledge of technology, Mathematics, networks and computing in the computer science.
		Identify, design and analyze complex computer system and implement result from that system.
		Analyze the local and global impact of computing on individual, organization and society.

### Program Specific Outcomes

Serial No.	Course Name	
1	Program Specific Outcomes	Appreciate new software and hardware technologies and extend their knowledge in specific areas of interest in academy and industry.
		Apply advance software practices and strategies in software project development using open-source programming environment to deliver a quality product for business success.
		Provide to work in an IT environment with the opportunity to enhance their career prospects by gaining additional knowledge and skills in selected areas of IT.



**S.M.D.L COLLEGE, KALAMBOLI**  
**DEPT. OF COMPUTER SCIENCE**  
**COURSE OUTCOMES OF BSC (CS) (2018-19)**

<b>I SEMESTER BSC(CS)</b>	
<b>Course</b>	<b>Outcomes</b>
<b>SUBJECT NAME: Computer Organization and Design</b>	<ul style="list-style-type: none"> <li>• Understand the concept of Basic structure and operation of a computer</li> <li>• implements the Representation of numbers and characters</li> <li>• Knowing the main components of a processor (ALU, control units etc.)</li> <li>• Implementing the Basic I/O operation.</li> </ul>
<b>SUBJECT NAME: Free and Open Source Software</b>	<ul style="list-style-type: none"> <li>• Understanding the concept of Open Source and Free Software</li> <li>• Comparison between Open Source and Free Software</li> <li>• Understanding the different FOSS Licenses (Apache, BSD etc.)</li> <li>• understand advance Open Source Operating application system</li> </ul>
<b>SUBJECT NAME: Database Systems</b>	<ul style="list-style-type: none"> <li>• Understanding the fundamental concepts of database management and relational data model for an organizational requirement.</li> <li>• Getting knowledge about different type of Entity E Relationship Model</li> <li>• Implementing basic security in database system.</li> <li>• Uses of query language to perform Create, Alter, Rename, drop etc. transaction on the database.</li> </ul>
<b>SUBJECT NAME: Programming with Python- I</b>	<ul style="list-style-type: none"> <li>• Understanding the basic concept of Reasons for Python as the learner is first programming language.</li> <li>• Knowing about the different types of statement.</li> <li>• Understanding the different conditional statements.</li> <li>•</li> </ul>
<b>SUBJECT NAME: Soft Skills Development</b>	<ul style="list-style-type: none"> <li>• Understanding the difference and module between Soft Skills and Hard Skills.</li> <li>• Having the knowledge about Academic Skills</li> <li>• Understanding the concept of Professional Skills.</li> </ul>
<b>II SEMESTER BSC(CS)</b>	
<b>Course</b>	<b>Outcomes</b>
<b>SUBJECT NAME: Programming with C</b>	<ul style="list-style-type: none"> <li>• Understand the comprehensive study of the C programming language</li> <li>• Implements different data types in a computer program (INT, FLOAT, CHAR etc.)</li> <li>• Able to write, compile and debug programs in C Language Implementing the Basic I/O operation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding different data structures and create/update basic data files.</li> </ul>
<b>SUBJECT NAME: Programming with Python- II</b>	<ul style="list-style-type: none"> <li>• Understanding the programming can be used for designing real-life applications by reading/writing to files.</li> <li>• Understand how to read/write to files using python.</li> <li>• Understanding the concept that catch their own errors that happen during execution of programs</li> <li>• Apply to connect the computers, read from URL and send email</li> </ul>
<b>SUBJECT NAME: Linux</b>	<ul style="list-style-type: none"> <li>• To understanding, the day-to-day work in Linux environment introduces various tools and techniques commonly used by Linux programmers, system administrators and end users.</li> <li>• Getting knowledge about different type of Entity E Relationship Model</li> <li>• Implementing basic security in database system.</li> <li>• Uses of query language to perform Create, Alter, Rename, drop etc. transaction on the database.</li> </ul>
<b>SUBJECT NAME: Data Structures</b>	<ul style="list-style-type: none"> <li>• Understand the concepts of Data Structures and its significance in programming.</li> <li>• Understand the commonly used data structures and various forms of its implementation for different applications using Python.</li> <li>• Learn about Data structures, its types and significance in computing.</li> <li>• Ability to program various applications using different data structure in Python.</li> </ul>
<b>SUBJECT NAME: Green Technologies</b>	<ul style="list-style-type: none"> <li>• Encouraging optimized software and hardware designs for development of Green IT Storage, Communication and Services.</li> <li>• Learn about green IT can be achieved in and by hardware, software, network communication and data center operations</li> <li>• Understand the strategies, frameworks, processes and management of green IT.</li> </ul>



### III SEMESTER BSC(CS)

Course	Outcomes
<b>SUBJECT NAME: Theory of Computation</b>	<ul style="list-style-type: none"> <li>• Understanding grammar, languages and other elements of modern language design.</li> <li>• Develop capabilities to design and develop formulations for computing models and identify its applications in diverse areas.</li> <li>• Learn about Turing Machines and Pushdown Automata.</li> </ul>
<b>SUBJECT NAME: Core JAVA</b>	<ul style="list-style-type: none"> <li>• Understanding the concept of Object oriented programming concepts using Java.</li> <li>• Knowledge of input, its processing and getting suitable output.</li> <li>• Understand, design, implement and evaluate classes and applets.</li> <li>• Knowledge and implementation of AWT package.</li> </ul>
<b>SUBJECT NAME: Operating System</b>	<ul style="list-style-type: none"> <li>• Understand proper working of operating system.</li> <li>• Understanding of Computer operating system, its structures, functioning and algorithms.</li> <li>• Develop and master understanding of algorithms used by operating systems for various purposes.</li> </ul>
<b>SUBJECT NAME: Database Management Systems</b>	<ul style="list-style-type: none"> <li>• Understanding of concepts and techniques for data management and learn about widely used systems for implementation and usage.</li> <li>• Learn about using PL/SQL for data management</li> <li>• Understand concepts and implementations of transaction management and crash recovery</li> </ul>
<b>SUBJECT NAME: Physical Computing and IoT Programming</b>	<ul style="list-style-type: none"> <li>• Enable learners to understand System On Chip Architectures.</li> <li>• Introduction and preparing Raspberry Pi with hardware and installation.</li> <li>• Learn physical interfaces and electronics of Raspberry Pi and program them using practical's</li> <li>• Learn how to make consumer grade IoT safe and secure with proper use of protocols.</li> </ul>
<b>SUBJECT NAME: Skill Enhancement: Web Programming</b>	<ul style="list-style-type: none"> <li>• Understanding technologies to design and develop state of - the art web applications using client-side scripting, server-side scripting, and database connectivity.</li> <li>• Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites.</li> <li>• Learn and implement client-side and server-side scripting language and Database Driven Websites.</li> <li>• Getting knowledge about HTML, CSS, JavaScript, PHP, Ajax and JQuery.</li> </ul>

**IV SEMESTER BSC(CS)**

Course	Outcomes
<b>SUBJECT NAME: Fundamentals of Algorithms</b>	<ul style="list-style-type: none"> <li>• Understand basic principles of algorithm design and why algorithm analysis is important.</li> <li>• understand how to implement algorithms in Python</li> <li>• Understand how to transform new problems into algorithmic problems with efficient solutions.</li> <li>• Understand the concepts of algorithms for designing good program.</li> </ul>
<b>SUBJECT NAME: Advanced JAVA</b>	<ul style="list-style-type: none"> <li>• Understanding the different swing components and JDBC drivers.</li> <li>• Getting knowledge about Swing and JSP.</li> <li>• Understand the concepts related to Java Technology.</li> <li>• Explore and understand use of Java Server Programming.</li> </ul>
<b>SUBJECT NAME: Computer Networks</b>	<ul style="list-style-type: none"> <li>• Introduction of networking model with different layers.</li> <li>• Understand the concepts of networking, which are important for them to be known as a '<i>networking professionals</i>'.</li> <li>• Useful to proceed with industrial requirements and International vendor certifications.</li> </ul>
<b>SUBJECT NAME: Software Engineering</b>	<ul style="list-style-type: none"> <li>• Understanding the concept of software engineering and Requirement Analysis and System Modeling.</li> <li>• Getting knowledge about Estimation in Project Planning Process.</li> <li>• Knowing different technique of Software Quality Assurance and software techniques.</li> </ul>
<b>SUBJECT NAME: Linear Algebra using Python</b>	<ul style="list-style-type: none"> <li>• .Understanding the relevant linear algebra concepts through computer science applications.</li> <li>• Getting computational thinking while learning linear algebra</li> </ul>
<b>SUBJECT NAME: .NET Technologies</b>	<ul style="list-style-type: none"> <li>• Understanding .NET technologies for designing and developing dynamic, interactive and responsive web applications.</li> <li>• Develop a proficiency in the C# programming language.</li> <li>• Understand the concept of ADO.NET for data persistence in a web application.</li> </ul>
<b>SUBJECT NAME: Skill Enhancement: Android Developer Fundamentals</b>	<ul style="list-style-type: none"> <li>• Understanding the concept of developing applications running on smart mobile devices and demonstrate programming skills for managing task on mobile</li> <li>• Learn about basic methods, tools and techniques for developing Apps</li> <li>• Understand the technique of App development on Android Platform.</li> </ul>

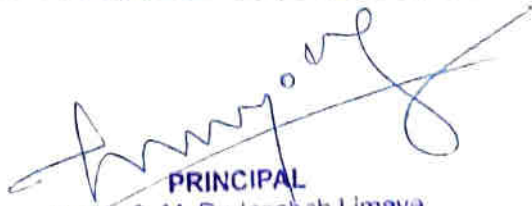


**V SEMESTER BSC(CS)**

Course	Outcomes
<p><b>SUBJECT NAME:</b> Artificial Intelligence</p>	<ul style="list-style-type: none"> <li>• Clear understanding of AI and different search algorithms used for solving problems.</li> <li>• Getting knowledge about different learning algorithms and models used in machine learning.</li> </ul>
<p><b>SUBJECT NAME:</b> Software Testing and Quality Assurance</p>	<ul style="list-style-type: none"> <li>• Getting knowledge about Software Testing techniques.</li> <li>• Understand how testing methods can be used as an effective tools in providing quality assurance concerning for software.</li> <li>• Knowing the skills to design test case plan for testing software.</li> <li>• Understand various software testing methods and strategies.</li> <li>• Understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.</li> <li>•</li> </ul>
<p><b>SUBJECT NAME:</b> Information and Network Security</p>	<ul style="list-style-type: none"> <li>• Knowledge of basic concepts of computer security including network security and cryptography.</li> <li>• Understand a variety of generic security threats and vulnerabilities, and identify &amp; analyze particular security problems for a given application.</li> <li>• Understand various protocols for network security to protect against the threats in a network.</li> </ul>
<p><b>SUBJECT NAME:</b> Web Services</p>	<ul style="list-style-type: none"> <li>• Understand the details of web services technologies like SOAP, WSDL, and UDDI. To learn how to implement and deploy web service client and server.</li> <li>• Understand the design principles and application of SOAP and REST based web services (JAX-WS and JAX-RS).</li> <li>• Understand WCF service. To design secure web services and QoS of Web Services.</li> </ul>
<p><b>SUBJECT NAME:</b> Game Programming</p>	<ul style="list-style-type: none"> <li>• Understanding computer Graphics programming using DirectX.</li> <li>• Understanding the concept of Graphics and gaming concepts with present working style of developers where everything remains on internet and they need to review it, understand it, be a part of community and learn.</li> </ul>

**VI SEMESTER BSC(CS)**

<b>Course</b>	<b>Outcomes</b>
<b>SUBJECT NAME:</b> Wireless Sensor Networks and Mobile Communication	<ul style="list-style-type: none"> <li>• Having knowledge about wireless and adhoc network, connecting different wireless devices and understanding their compatibility is very important.</li> <li>• Understand the framework and various applications of wireless sensor networks; describe the concepts, protocols, design, implementation and use of wireless sensor networks.</li> </ul>
<b>SUBJECT NAME:</b> Cyber Forensics	<ul style="list-style-type: none"> <li>• Understand the procedures for identification, preservation, and extraction of electronic evidence, auditing and investigation of network and host system intrusions, analysis and documentation of information gathered.</li> <li>• Getting knowledge about detection, initial response and management interaction, investigate various media to collect evidence, report them in a way that would be acceptable in the court of law.</li> </ul>
<b>SUBJECT NAME:</b> Information Retrieval	<ul style="list-style-type: none"> <li>• Understanding of the field of information retrieval and its relationship to search engines.</li> <li>• Understanding to apply information retrieval models.</li> <li>• Getting knowledge about different type of search engine and XML retrieval.</li> </ul>
<b>SUBJECT NAME:</b> Digital Image Processing	<ul style="list-style-type: none"> <li>• Understand the two-dimensional Signals and Systems.</li> <li>• Understand image fundamentals and transforms necessary for image processing.</li> <li>• Getting knowledge about image enhancement techniques in spatial and frequency domain.</li> <li>• Knowing about image segmentation and image compression techniques.</li> <li>•</li> </ul>
<b>SUBJECT NAME:</b> Ethical Hacking	<ul style="list-style-type: none"> <li>• Understand the ethics, legality, methodologies and techniques of hacking.</li> <li>• Getting the knowledge about identify security vulnerabilities and weaknesses in the target applications.</li> <li>• Learn about different types of security from hacking.</li> </ul>



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**DEPARTMENT: MICROBIOLOGY**  
**PROGRAMME: B SC (2018-19)**

**Statements of Programme Specific Outcomes (PSOs)**

By the end of this course, the students will be able to:

1. Understand the contributions of various scientist in microbiology and scope of various branches
2. Understand various kinds of prokaryotic & eukaryotic microbes and their interactions
3. Explain and describe importance of organic compounds and its chemistry found in living cells
4. Understand and explain various processes of metabolism of carbohydrates amino acids and vitamins
5. Explain DNA, RNA and protein structure and their synthesis
6. Understand the concept of disease development, spread, control and eradication from society
7. Understand the basic concepts of gene and their regulation of action
8. Explain and write various industrial fermentations and bioinstrumentation.

**Statements of Course Outcomes (COs)**

**Course: Sem I Paper 1 : Fundamentals of Microbiology**

By the end of this course, the students will be able to:

1. Understand the contributions of eminent scientists in the development of microbiology
2. Understand the ultra structure of bacterial cell
3. Compare the differences in bacterial cell with plant cell and animal cell
4. Classify the bacteria on the basis of various parameters.

**Course: Sem I Paper 2 : Basic Techniques in Microbiology**

By the end of this course, the students will be able to:

1. Understand and explain basic principles and different kinds of microscope
2. Explain the process of different staining techniques
3. Understand and compare various types of stains and dyes
4. Analyze the determination of specific nutrients by bacteria

**Course: Sem I Practical**

By the end of this course, the students will be able to:

1. Understand working and mechanism of different equipments and tools used in microbiology
2. Prepare various nutrients media for cultivating microbes in laboratory
3. Perform the staining technique of various bacteria
4. Design an experiment to isolate specific bacteria in pure form from sample
5. Determine the sensitivity of specific bacteria to given antibiotics

**Course: Sem II Paper 1 : Basics of Microbiology**

By the end of this course, the students will be able to:

1. Understand the basic nutritional requirements of bacteria
2. Describe various types of nutrient media for cultivation and isolation of bacteria
3. Explain typical growth curve of bacteria
4. Understand the factors that responsible for bacterial growth
5. Explain mechanism of bacterial cell injury by an anti-microbial agent like anti-biotic.

**Course: Sem II Paper 2 : Exploring Microbiology**

By the end of this course, the students will be able to:

1. To understand types of microbial interaction.
2. To study Human Microbe interaction.
3. Explain Microbial association with vascular plants.
4. To study Microbe and Human health.
5. Understand instrumentation and techniques in microbiology.

**Course: Practical Sem 2**

By the end of this course, the students will be able to:

1. Enumerate bacterial load in the food sample in quality unit
2. Cultivate bacteria in the lab by using aerobic & anaerobic techniques
3. Demonstrate antimicrobial power of heavy metal ion against any bacteria
4. Demonstrate effect UV radiations of bacterial growth.

**Course: Sem III Paper 1 Biomolecules and Microbial Taxonomy**

By the end of this course, the students will be able to:

1. Understand the classification of organic compounds like carbohydrates
2. Understand the chemistry of different kinds of carbohydrates
3. Describe importance of vitamins to human body and their deficiency syndrome
4. Compare DNA and RNA
5. Understand the mechanism of enzyme.

**Course: Sem III Paper 2 Environmental Microbiology**

By the end of this course, the students will be able to:

1. Study air microbiology.
2. Understand flora of fresh water and sewage microbiology.
3. Explain disposal of treated waste water and biosolids.
4. To study Soil Bioremediation.

**Course: Sem III Paper 3 Introduction to Clinical Microbiology**

By the end of this course, the students will be able to:

1. Study morphology and physiology of Bacteria.
2. Understand infections of Respiratory systems.
3. Explain Epidemiology and Public Health Awareness.
4. To study the spread of infection.
5. Understand Control of Microorganisms & Safety in Clinical Microbiology

**Course: Practical Sem III**

By the end of this course, the students will be able to:

1. Design practical experiments to identify carbohydrates from given sample
2. Demonstrate enzyme activity by bacteria
3. Understand the techniques to estimate proteins, RNA, DNA from given sample
4. Design an experiment to produce ethanol by fermentation technique
5. Demonstrate application of yeast in baking industry

**Course: : Sem IV Paper 1 Metabolism & Basic Analytical Techniques**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the general strategy of metabolism
2. Understand and explain various metabolic processes operating in living cell
3. Understand the mechanism by which energy is generated in human body
4. Explain and describe the process of protein formation in living cell
5. Explain and describe the process of replication of DNA

**Course: Sem IV Paper 2 Applied Microbiology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the significance of bacteriological analysis of drinking water
2. Understand and describe various methods applied for treatment of water and waste water
3. Explain the methods for disposal of industrial wastes
4. Understand the role of microbes of soil in various important processes
5. Describe and explain the applications of bacteria and fungi in bio fertilizers



**Course: Sem IV Paper 3 Fermented Foods, Food Sanitation and Microbial Ecology**

By the end of this course, the students will be able to:

1. Understand Microorganisms used in food fermentations.
2. Study Food borne diseases.
3. Understand Food laws and food adulteration.
4. Study Microbial evolution and ecology.
5. To understand Microbial ecosystems.

**Course: Practical Sem IV**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the techniques to isolate microbes from water and waste water( sewage)
2. Understand and demonstrate chlorination of water
3. Demonstrate the technique to find out the alkalinity of water sample
4. Design the experiment to find out quality of raw material
5. Find out microbial load in given drinking water sample.

**Course: Sem V Paper 1 DNA technology, Bioinformatics & virology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand Prokaryotic and Eukaryotic DNA replication.
2. Explain enzymes and proteins associated with DNA replication.
3. To study Central Dogma: An Overview, Transcription process, Transcription in bacteria.
4. Explain Transcription, Genetic Code and Translation.
5. Study Gene transfer mechanisms in bacteria.

**Course: Sem V Paper 2 Medical Microbiology & Immunology Part I**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the stages of infectious diseases
2. Describe various modes by which infections spread in community
3. Describe various methods that can be adopted to control spread of infection in community
4. Understand the properties, structure and importance of antibiotics in immunity
5. Understand various mechanism by which antibiotic destroys antigens
6. Describe and explain the reasons, classes and development of allergy in humans.

**Course: Sem V Paper 3 Microbial Biochemistry Part I**

By the end of this course, the students will be able to:

1. Understand Biological Membranes & Transport.
2. Describe assembly of proteins into membranes and protein export.
3. Describe Biochemical mechanism of generating ATP.
4. Understand experimental Analysis of metabolism.
5. Study Fermentative pathways & Anabolism of carbohydrates.

**Course: Sem V Paper 4 Bioprocess Technology: Part - I**

By the end of this course, the students will be able to:

1. Understand and describe scope of industrial microbiology
2. Understand and operate fermenters in various industries
3. Explain the process of commercial production and ethanol Vitamin B2 Beer, Wine Penicillin etc.
4. Perform the methods and harvesting and product recovery in industrial fermentations
5. Work out the maintenance of ferment or plant.

**Course: Sem V Paper 5 Biotechnology – Applied Component**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the tools and techniques of genetic engineering
2. Understand and describe DNA, fingerprinting and its application in forensic science
3. Understand the methods of production of health related compounds by biotechnology
4. Understand and write application of biotechnology in agriculture
5. Explain and describe the advantages /disadvantages of genetic engineering for humans
6. Understand the production and importance of genetically modified food

**Course: Practical Sem V**

Course outcomes: By the end of this course, the students will be able to:

1. Understand UV survival curve – determination of exposure time leading to 90% reduction
2. Describe Identification of isolates obtained from pus, sputum, stool and urine by morphological, cultural and biochemical properties.
3. Study Qualitative and Quantitative assay of Phosphatase
4. Glucose detection by GOD/POD.
5. Determination of antibiotic spectrum using agar strip / streak method.

**Course: Sem VI Paper 1 rDNA technology, Bioinformatics & virology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and describe Recombinant DNA Technology.
2. Understand basic steps in Gene Cloning.
3. Describe Screening and selection methods for identification and isolation of recombinant cells.
4. Explain Regulation of lytic and lysogenic pathway of lambda phage.
5. Understand Visualization and enumeration of virus particles.

**Course: Sem VI Paper 2 Medical Microbiology & Immunology Part II**

Course outcomes: By the end of this course, the students will be able to:

1. Study of a Few Diseases with Emphasis on Cultural Characteristics of the Etiological Agent, Pathogenesis, Laboratory Diagnosis and Prevention.
2. Describe Attributes of an ideal chemotherapeutic agent.
3. Understand Cell mediated effector response.
4. Describe route of vaccine administration, Vaccination schedule.

**Course: Sem VI Paper 3 Microbial Biochemistry Part II**

Course outcomes: By the end of this course, the students will be able to:

1. Describe Lipid Metabolism & Catabolism of Hydrocarbons.
2. Describe enzymatic degradation of proteins.
3. Understand DNA binding proteins and regulation of transcription by positive & negative control.
4. Study Global regulatory mechanism.
5. Explain prokaryotic photosynthesis & inorganic metabolism.

**Course: Sem VI Paper 4 Bioprocess Technology: Part – II**

Course outcomes: By the end of this course, the students will be able to:

1. Understand dissolved oxygen concentration as indicator of water quality.
2. Study Applications of cell culture: Vaccines, somatic cell fusion, valuable products.
3. Describe Quality Assurance, Quality Control, Instrumentation and Bioassay.
4. Explain instrumentation, principles, working and application of Spectrophotometry.
5. Explain Methods of penicillin fermentation.

**Course: Sem VI Paper 4 Biotechnology – Applied Component**

Course outcomes: By the end of this course, the students will be able to:

1. Understand agricultural, animal and plant Biotechnology.
2. Explain Development of stress and senescence tolerant plants.
3. Describe Methodology in Animal and Plant Biotechnology
4. Explain Biological fuel generation




5. Explain Products from non recombinant and recombinant organisms.

**Course: Practical Sem VI**

Course outcomes: By the end of this course, the students will be able to:

1. Isolation of genomic DNA of E. coli and measurement of its concentration by UV-VIS.
2. Determination of MBC of an antibiotic.
3. Blood grouping – Direct & Reverse typing.
4. Detection of PHB producing bacteria.
5. Bioassay of an antibiotic (Ampicillin / Penicillin).



  
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**DEPARTMENT: MICROBIOLOGY**  
**PROGRAMME: B SC (2018-19)**

**Statements of Programme Specific Outcomes (PSOs)**

By the end of this course, the students will be able to:

1. Understand the contributions of various scientist in microbiology and scope of various branches
2. Understand various kinds of prokaryotic & eukaryotic microbes and their interactions
3. Explain and describe importance of organic compounds and its chemistry found in living cells
4. Understand and explain various processes of metabolism of carbohydrates amino acids and vitamins
5. Explain DNA, RNA and protein structure and their synthesis
6. Understand the concept of disease development, spread, control and eradication from society
7. Understand the basic concepts of gene and their regulation of action
8. Explain and write various industrial fermentations and bioinstrumentation.

**Statements of Course Outcomes (COs)**

**Course: Sem I Paper 1 : Fundamentals of Microbiology**

By the end of this course, the students will be able to:

1. Understand the contributions of eminent scientists in the development of microbiology
2. Understand the ultra structure of bacterial cell
3. Compare the differences in bacterial cell with plant cell and animal cell
4. Classify the bacteria on the basis of various parameters.

**Course: Sem I Paper 2 : Basic Techniques in Microbiology**

By the end of this course, the students will be able to:

1. Understand and explain basic principles and different kinds of microscope
2. Explain the process of different staining techniques
3. Understand and compare various types of stains and dyes
4. Analyze the determination of specific nutrients by bacteria

**Course: Sem I Practical**

By the end of this course, the students will be able to:

1. Understand working and mechanism of different equipments and tools used in microbiology
2. Prepare various nutrients media for cultivating microbes in laboratory
3. Perform the staining technique of various bacteria
4. Design an experiment to isolate specific bacteria in pure form from sample
5. Determine the sensitivity of specific bacteria to given antibiotics

**Course: Sem II Paper 1 : Basics of Microbiology**

By the end of this course, the students will be able to:

1. Understand the basic nutritional requirements of bacteria
2. Describe various types of nutrient media for cultivation and isolation of bacteria
3. Explain typical growth curve of bacteria
4. Understand the factors that responsible for bacterial growth
5. Explain mechanism of bacterial cell injury by an anti-microbial agent like anti-biotic.

**Course: Sem II Paper 2 : Exploring Microbiology**

By the end of this course, the students will be able to:

1. To understand types of microbial interaction.
2. To study Human Microbe interaction.
3. Explain Microbial association with vascular plants.
4. To study Microbe and Human health.
5. Understand instrumentation and techniques in microbiology.



**Course: Practical Sem 2**

By the end of this course, the students will be able to:

1. Enumerate bacterial load in the food sample in quality unit
2. Cultivate bacteria in the lab by using aerobic & anaerobic techniques
3. Demonstrate antimicrobial power of heavy metal ion against any bacteria
4. Demonstrate effect UV radiations of bacterial growth.

**Course: Sem III Paper 1 Biomolecules and Microbial Taxonomy**

By the end of this course, the students will be able to:

1. Understand the classification of organic compounds like carbohydrates
2. Understand the chemistry of different kinds of carbohydrates
3. Describe importance of vitamins to human body and their deficiency syndrome
4. Compare DNA and RNA
5. Understand the mechanism of enzyme.

**Course: Sem III Paper 2 Environmental Microbiology**

By the end of this course, the students will be able to:

1. Study air microbiology.
2. Understand flora of fresh water and sewage microbiology.
3. Explain disposal of treated waste water and biosolids.
4. To study Soil Bioremediation.

**Course: Sem III Paper 3 Introduction to Clinical Microbiology**

By the end of this course, the students will be able to:

1. Study morphology and physiology of Bacteria.
2. Understand infections of Respiratory systems.
3. Explain Epidemiology and Public Health Awareness.
4. To study the spread of infection.
5. Understand Control of Microorganisms & Safety in Clinical Microbiology

**Course: Practical Sem III**

By the end of this course, the students will be able to:

1. Design practical experiments to identify carbohydrates from given sample
2. Demonstrate enzyme activity by bacteria
3. Understand the techniques to estimate proteins, RNA, DNA from given sample
4. Design an experiment to produce ethanol by fermentation technique
5. Demonstrate application of yeast in baking industry

**Course: : Sem IV Paper 1 Metabolism & Basic Analytical Techniques**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the general strategy of metabolism
2. Understand and explain various metabolic processes operating in living cell
3. Understand the mechanism by which energy is generated in human body
4. Explain and describe the process of protein formation in living cell
5. Explain and describe the process of replication of DNA

**Course: Sem IV Paper 2 Applied Microbiology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the significance of bacteriological analysis of drinking water
2. Understand and describe various methods applied for treatment of water and waste water
3. Explain the methods for disposal of industrial wastes
4. Understand the role of microbes of soil in various important processes
5. Describe and explain the applications of bacteria and fungi in bio fertilizers

**Course: Sem IV Paper 3 Fermented Foods, Food Sanitation and Microbial Ecology**

By the end of this course, the students will be able to:

1. Understand Microorganisms used in food fermentations.
2. Study Food borne diseases.
3. Understand Food laws and food adulteration.
4. Study Microbial evolution and ecology.
5. To understand Microbial ecosystems.

**Course: Practical Sem IV**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the techniques to isolate microbes from water and waste water( sewage)
2. Understand and demonstrate chlorination of water
3. Demonstrate the technique to find out the alkalinity of water sample
4. Design the experiment to find out quality of raw material
5. Find out microbial load in given drinking water sample.

**Course: Sem V Paper 1 DNA technology, Bioinformatics & virology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand Prokaryotic and Eukaryotic DNA replication.
2. Explain enzymes and proteins associated with DNA replication.
3. To study Central Dogma: An Overview, Transcription process, Transcription in bacteria.
4. Explain Transcription, Genetic Code and Translation.
5. Study Gene transfer mechanisms in bacteria.

**Course: Sem V Paper 2 Medical Microbiology & Immunology Part I**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the stages of infectious diseases
2. Describe various modes by which infections spread in community
3. Describe various methods that can be adopted to control spread of infection in community
4. Understand the properties, structure and importance of antibiotics in immunity
5. Understand various mechanism by which antibiotic destroys antigens
6. Describe and explain the reasons, classes and development of allergy in humans.

**Course: Sem V Paper 3 Microbial Biochemistry Part I**

By the end of this course, the students will be able to:

1. Understand Biological Membranes & Transport.
2. Describe assembly of proteins into membranes and protein export.
3. Describe Biochemical mechanism of generating ATP.
4. Understand experimental Analysis of metabolism.
5. Study Fermentative pathways & Anabolism of carbohydrates.

**Course: Sem V Paper 4 Bioprocess Technology: Part - I**

By the end of this course, the students will be able to:

1. Understand and describe scope of industrial microbiology
2. Understand and operate fermenters in various industries
3. Explain the process of commercial production and ethanol Vitamin B2 Beer, Wine Penicillin etc.
4. Perform the methods and harvesting and product recovery in industrial fermentations
5. Work out the maintenance of ferment or plant.



**Course: Sem V Paper 5 Biotechnology – Applied Component**

Course outcomes: By the end of this course, the students will be able to:

1. Understand the tools and techniques of genetic engineering
2. Understand and describe DNA, fingerprinting and its application in forensic science
3. Understand the methods of production of health related compounds by biotechnology
4. Understand and write application of biotechnology in agriculture
5. Explain and describe the advantages /disadvantages of genetic engineering for humans
6. Understand the production and importance of genetically modified food

**Course: Practical Sem V**

Course outcomes: By the end of this course, the students will be able to:

1. Understand UV survival curve – determination of exposure time leading to 90% reduction
2. Describe Identification of isolates obtained from pus, sputum, stool and urine by morphological, cultural and biochemical properties.
3. Study Qualitative and Quantitative assay of Phosphatase
4. Glucose detection by GOD/POD.
5. Determination of antibiotic spectrum using agar strip / streak method.

**Course: Sem VI Paper 1 rDNA technology, Bioinformatics & virology**

Course outcomes: By the end of this course, the students will be able to:

1. Understand and describe Recombinant DNA Technology.
2. Understand basic steps in Gene Cloning.
3. Describe Screening and selection methods for identification and isolation of recombinant cells.
4. Explain Regulation of lytic and lysogenic pathway of lambda phage.
5. Understand Visualization and enumeration of virus particles.

**Course: Sem VI Paper 2 Medical Microbiology & Immunology Part II**

Course outcomes: By the end of this course, the students will be able to:

1. Study of a Few Diseases with Emphasis on Cultural Characteristics of the Etiological Agent, Pathogenesis, Laboratory Diagnosis and Prevention.
2. Describe Attributes of an ideal chemotherapeutic agent.
3. Understand Cell mediated effector response.
4. Describe route of vaccine administration, Vaccination schedule.

**Course: Sem VI Paper 3 Microbial Biochemistry Part II**

Course outcomes: By the end of this course, the students will be able to:

1. Describe Lipid Metabolism & Catabolism of Hydrocarbons.
2. Describe enzymatic degradation of proteins.
3. Understand DNA binding proteins and regulation of transcription by positive & negative control.
4. Study Global regulatory mechanism.
5. Explain prokaryotic photosynthesis & inorganic metabolism.

**Course: Sem VI Paper 4 Bioprocess Technology: Part – II**

Course outcomes: By the end of this course, the students will be able to:

1. Understand dissolved oxygen concentration as indicator of water quality.
2. Study Applications of cell culture: Vaccines, somatic cell fusion, valuable products.
3. Describe Quality Assurance, Quality Control, Instrumentation and Bioassay.
4. Explain instrumentation, principles, working and application of Spectrophotometry.
5. Explain Methods of penicillin fermentation.

**Course: Sem VI Paper 4 Biotechnology – Applied Component**

Course outcomes: By the end of this course, the students will be able to:

1. Understand agricultural, animal and plant Biotechnology.
2. Explain Development of stress and senescence tolerant plants.
3. Describe Methodology in Animal and Plant Biotechnology
4. Explain Biological fuel generation


5. Explain Products from non recombinant and recombinant organisms.

**Course: Practical Sem VI**

Course outcomes: By the end of this course, the students will be able to:

1. Isolation of genomic DNA of E. coli and measurement of its concentration by UV-VIS.
2. Determination of MBC of an antibiotic.
3. Blood grouping – Direct & Reverse typing.
4. Detection of PHB producing bacteria.
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