



Shikshan Prasarak Mandal Kolhapur's

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**Re-accredited by NAAC - 'B' Grade**

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1.2.1: Percentage of Programmes in which Choice Based Credit System (CBCS)/  
elective course system has been implemented

**All Syllabus e-copies:**

**UNIVERSITY OF MUMBAI**

No. UG/ 74 of 2018-19

**CIRCULAR:-**

Attention of the Principals of the Affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty is invited to this office circular No. UG/17 of 2005, dated 13<sup>th</sup> January, 2005 relating to syllabus of Bachelor of Arts.

They are hereby informed that the recommendations made by the Board of Studies in History and Archaeology at its meeting held on 25<sup>th</sup> May, 2018 have been accepted by the Academic Council at its meeting held on 14<sup>th</sup> June, 2018 **vide** item No. 4.1 and that in accordance therewith, the revised syllabus as per the (CBCS) for the T.Y.B.A. in History & Archaeology – Sem V & VI has been brought into force with effect from the academic year 2018-19, accordingly. (The same is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032

6<sup>th</sup> June, 2018

To

July

  
(Dr. Dinesh Kamble)  
I/c REGISTRAR

The Principals of the affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty. (Circular No. UG/334 of 2017-18 dated 9<sup>th</sup> January, 2018.)

A.C./4.1/14/06/2018

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No. UG/ 74 -A of 2018

MUMBAI-400 032

6<sup>th</sup> June, 2018  
July

Copy forwarded with Compliments for information to:-

- 1) The I/c Dean, Faculty of Humanities,
- 2) The Chairman, Board of Studies in History & Archaeology,
- 3) The Director, Board of Examinations and Evaluation,
- 4) The Director, Board of Students Development,
- 5) The Professor-cum-Director, Institute of Distance and Open Learning (IDOL),
- 6) The Co-Ordinator, University Computerization Centre,

  
(Dr. Dinesh Kamble)  
I/c REGISTRAR

AC / /2018  
Item no.

# UNIVERSITY OF MUMBAI



**Revised Syllabus for Sem V and Sem VI**

**Program: B. A.**

**Course: History and Archaeology**

(Choice Based Credit System with effect from the  
Academic year 2018-2019)

# Revised Syllabus

Semester V and Semester VI  
Programme: B.A.  
Course: History and Archaeology

(Choice Based Credit System with effect from the Academic year 2018-2019)

## As per University rules and guidelines for Faculty of Humanities

Faculty of Humanities  
TYBA  
(Choice Based Credit System, CBCS)  
Semester V and Semester VI  
Guidelines  
With Effect From 2018-2019

### Syllabus Structure:

1. In TYBA (CBCS) in Sem V and Sem VI, the Core Courses will be Core Courses IV, V, VII and VIII.
2. The Elective Courses will be Elective Courses VI and IX which will be partially Project Based Courses. The Boards of Studies may offer choices in the Elective Courses VI and IX.
3. In Sem V and Sem VI, each Course namely Core Courses IV, V, VII and VIII and Elective Courses VI and IX will carry 4 Credits per Course per Semester.

### Evaluation:

1. **Core Courses:** The Core Courses IV, V, VII and VIII will be theory based Core Courses. The University of Mumbai will conduct the Sem V and Sem VI examinations of 100 marks per Core Course. In Sem V and Sem VI for all the above Core Courses, the student will have to secure a minimum of 40% marks in aggregate per Core Course.
2. **Elective Courses:** The Elective Courses VI and IX will be Electives and Choices of Electives may be offered by the various Board of Studies. The University of Mumbai will conduct the Sem V and Sem VI examination for Elective Courses VI and IX of 80 marks per Elective Course. The Elective Courses namely Elective Courses VI and IX will be partially Project Based Courses. In Sem V and VI, for Elective Course VI and for Elective Course IX, the Colleges will conduct the evaluation of a Project of 20 marks

each and will send the marks to the University of Mumbai as per University of Mumbai guidelines.

3. The total marks of the Elective Course VI and Elective Course IX will be 100 marks each that is 80 marks for Theory Examination conducted by University of Mumbai and 20 marks for Project evaluated by the concerned college Faculty in the subject.
4. In Sem V and Sem VI, the student will have to submit a Project for Elective Course VI and Elective Course IX in the College before appearing for the University Examination. The last date of submission of the Project will be officially declared by the College.
5. In Sem V and Sem VI, the Project topic will be based on the Syllabus of the respective Elective Courses that is Elective Course VI and Elective Course IX. The students will be given the choice of choosing the topic of the project in consultation with the Faculty Member teaching the respective Elective Course. The list of students along with the topics chosen by the students will be displayed by the College in the beginning of the Semester.
6. The Project work will be carried out by the student with the guidance of the concerned Faculty Member who will be allotted to the student as the Guide for the Project.
7. In Sem V and Sem VI, for Elective Courses VI and IX, the student will have to secure a minimum of 40% marks in aggregate and a minimum of 40% in each component of assessment i.e. 08 out of 20 marks in Internal Evaluation of Project in Elective Course VI and Elective Course IX and 32 out of 80 marks in University Examination of Elective Course VI and Elective Course IX.

Note: All other rules regarding Standard of Passing, ATKT, etc., will be as per those decided by the Faculty of Humanities passed by the Academic Council from time to time.

Faculty of Humanities  
TYBA  
(Choice Based Credit System, CBCS)  
Semester V and Semester VI  
Question Paper Pattern for T.Y.B.A (CBCS)  
for Core Courses IV, V, VII and VIII  
As per University rules and guidelines  
With Effect From 2018-2019

(Time: 3 Hours)

**Note: 1.** Attempt **all** questions

(Total = 100 marks)

**2.** All questions carry **equal** marks

Q.1 (Based on Module I)

(20 marks)

a.

or

b.

Q.2 (Based on Module II)

(20 marks)

a.

or

b.

Q.3 (Based on Module III)

(20 marks)

a.

or

b.

Q.4 (Based on Module IV)

(20 marks)

a.

or

b.

Q.5 Attempt **any two** short notes. (Based on Module I, II, III and IV)

(20 marks)

a.

b.

c.

d.

[The Question paper Pattern for the Revised Syallbus for Semester V and Semester VI, Programme: B.A; Course: History and Archaeology (Choice Based Credit System with effect from the Academic year 2018-2019) will be as per University rules and guidelines for the Faculty of Humanaities].

Faculty of Humanities  
TYBA  
(Choice Based Credit System, CBCS)  
Semester V and Semester VI  
Question Paper Pattern for T.Y.B.A (CBCS)  
for Elective Courses VI and IX  
As per University rules and guidelines  
With Effect From 2018-2019

(Time: 2 & 1/2 Hours)

**Note: 1. Attempt all questions**

(Total = 80 marks)

**2. All questions carry equal marks**

Q.1 (Based on Module I)

(20 marks)

a.

or

b.

Q.2 (Based on Module II)

(20 marks)

a.

or

b.

Q.3 (Based on Module III)

(20 marks)

a.

or

b.

Q.4 (Based on Module IV)

(20 marks)

a.

or

b.

[The Question paper Pattern for the Revised Syallbus for Semester V and Semester VI, Programme: B.A; Course: History and Archaeology (Choice Based Credit System with effect from the Academic year 2018-2019) will be as per University rules and guidelines for the Faculty of Humanaities].

## SYLLABUS

<b>SEMESTER – V</b>		
Course	Title of the Course	Credits
Core Course IV	History of Medieval India (1000 CE – 1526 CE)	4 Credits
Core Course V	History of Modern Maharashtra (1818 CE-1960 CE)	4 Credits
Elective Course VI. A (With Project)	Introduction to Archaeology	4 Credits
Elective Course VI B (With Project)	Media and Communication	4 Credits
Core Course VII	History of the Marathas (1630 CE -1707 CE)	4 Credits
Core Course VIII	History of Contemporary World (1945 CE -2000 CE)	4 Credits
Elective Course IX A (With Project)	Research Methodology and Sources of History	4 Credits
Elective Course IX B (With Project)	Introduction to Heritage Tourism	4 Credits
		Total 24 Credits



**SEMESTER – VI**

Course	Title of the Course	Credits
Core Course IV	History of Medieval India (1526 CE – 1707 CE)	4 Credits
Core Course V	History of Contemporary India (1947 CE- 2000 CE)	4 Credits
Elective Course VI A (With Project)	Introduction to Museology and Archival Science	4 Credits
Elective Course VI B (With Project)	Media and Communication	4 Credits
Core Course VII	History of the Marathas (1707 CE - 1818 CE)	4 Credits
Core Course VIII	History of Asia (1945 CE -2000 CE)	4 Credits
Elective Course IX A (With Project)	Research Methodology and Sources of History	4 Credits
Elective Course IX B (With Project)	Heritage Tourism in Maharashtra	4 Credits
		Total 24 Credits

# **T.Y.B.A. History**

## **SEMESTER -V**

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

#### **Objectives:**

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.

#### **Module I: Foundation, Expansion and Decline of Delhi Sultanate**

- (a) Socio-economic and political conditions on the eve of the Turkish Invasion
- (b) Rise and Decline of Slave dynasty, Khilji Dynasty
- (c) Tughlaq, Sayyid and Lodi Dynasty

#### **Module II: Administrative Structure of the Sultanate**

- (a) Central Administration and Iqta system
- (b) Administrative and Military Reforms of Ala-ud-din Khilji
- (c) Reforms of Firozshah Tughlaq and Mohammed bin Tughlaq

#### **Module III: Emergence of Vijaynagar and Bahamani Kingdoms**

- (a) Rise, Growth and Decline of Vijaynagar and Bahamani Kingdoms
- (b) Administration, Socio-Economic and Cultural conditions of Vijayanagar Empire
- (c) Administration, Socio-Economic and Cultural conditions of Bahamani Kingdom

#### **Module IV: Society, Economy, Religion and Culture of Delhi Sultanate**

- (a) Socio-economic and religious life
- (b) Education and Literature
- (c) Art and Architecture

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- Shrivastava M.P., *Society and Culture in Medieval India (1206 A.D. 1707 A. D.)*, Chugh Publishers, Allahabad, 1975.
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- Sardesai G. S., *Marathi Riyasat*, Popular Prakashan, Mumbai, 2012.

Sardesai G. S., *Musalmani Riyasat*, Bhag 1 Ani 2, Popular Prakashan, Mumbai 1993.  
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Mumbai, 1982.

# **T.Y.B.A. History**

## **SEMESTER -V**

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

#### **Objectives:**

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.

#### **Module I: Beginning of the British Rule**

- (a) Socio-Economic conditions of Maharashtra in 19<sup>th</sup> Century
- (b) Administration and Judiciary
- (c) Tribal and Peasant Uprisings

#### **Module II: Socio- Economic Awakening**

- (a) Mahatma Jotirao Phule - Satya Shodhak Samaj and Universal Humanism
- (b) Prarthana Samaj
- (c) Contribution of thinkers of Maharashtra to Economic Nationalism

#### **Module III: Political Developments in Maharashtra (1885-1960)**

- (a) Moderates, Extremists and Revolutionaries in Maharashtra
- (b) Response to Gandhian Movements in Maharashtra
- (c) Samyukta Maharashtra Movement

#### **Module IV: Emergence of New Forces**

- (a) Contribution of Reformers in Education
- (b) Contribution of Reformers towards Emancipation of Women
- (c) Contribution of Reformers towards Upliftment of Depressed Classes: V. R. Shinde, Rajarshi Shahu Maharaj and Dr. B.R. Ambedkar

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# **T.Y.B.A. History**

## **SEMESTER -V**

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

Objectives:

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.

#### **Module I: Aims and Methods of Archaeology**

- (a) Definition, Aims and Development of Archaeology in India
- (b) Archaeology and History; Archaeology and Other Sciences
- (c) Field Archaeology: Methods of Exploration, Excavation and Dating Antiquities; Significance of Archaeology

#### **Module II: Pre-Historic, Proto-Historic and Early Historical Periods**

- (a) Palaeolithic and Mesolithic Periods
- (b) Neolithic and Chalcolithic Periods
- (c) Megalithic and Early Historical Periods

#### **Module III: Epigraphy**

- (a) Definition and History of Indian Epigraphy
- (b) Types of Inscriptions and their significance
- (c) Evolution of Brahmi and Kharosthi Scripts; Edicts of Ashoka

#### **Module IV: Numismatics**

- (a) Definition and History of Indian Numismatics
- (b) Ancient Indian Coinage: Punch-Marked, Satavahana, Western Kshatrapas, Kushana and Gupta Coins
- (c) Contribution of Numismatics to Indian History

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# **T.Y.B.A. History**

## **SEMESTER -V**

### **Elective Course: Paper VI B –Media and Communication**

Objectives:

1. To inform students about the Fundamentals of Communication.
2. To introduce students to Oral Traditions in Communication and the field of Journalism.
3. To familiarize students with the various types of Audio-Visual Media.

#### **Module I: Fundamentals of Communication**

- (a) Definition, Evolution and Significance of Communication
- (b) Process, Types, Importance and Need of Communication
- (c) Barriers to Communication

#### **Module II: Oral Traditions in Communication**

- (a) Folk Theatre – Importance, Marathi Theatre
- (b) Major Dance Forms – Folk and Classical
- (c) Folk Expression – Songs, Stories and Puppetry

#### **Module III: Journalism**

- (a) Definition, Evolution and Types of Journalism
- (b) Role and Functions of Reporters, Sub-Editor and Editor
- (c) Freedom of Press – Importance, Ethics and Current Trends

#### **Module IV: Audio-Visual Media**

- (a) Photography – Types, Scope and Limitations
- (b) Cinema – Growth, Development and Technical Aspects
- (c) Types of Films and Global Indian Cinema

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# **T.Y.B.A. History**

## **SEMESTER -V**

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

Objectives:

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.

#### **Module I: Introduction to Maratha History**

- (a) Marathi, Persian and European Sources
- (b) Deccan in the 17<sup>th</sup> century – Geo-Political and Economic conditions
- (c) Socio-Cultural conditions; Maharashtra Dharma

#### **Module II: Establishment of Swarajya**

- (a) Shivaji's relations with Bijapur
- (b) Shivaji's relations with the Mughals
- (c) Shivaji's relations with the Europeans

#### **Module III: Period of Consolidation and Crisis**

- (a) Coronation and its significance; Shivaji's Karnatak Campaign
- (b) Sambhaji, Rajaram and Tarabai
- (c) Civil War : Tarabai and Shahu

#### **Module IV: Administration during the Royal Period**

- (a) Civil Administration
- (b) Revenue and Judicial Administration
- (c) Military Administration

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# **T.Y.B.A. History**

## **SEMESTER -V**

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

#### Objectives:

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.

#### **Module I: Cold War (1945-1985)**

- (a) Meaning, Causes of Cold War and Security Pacts
- (b) Conflicts in Cold War: Germany, Korea and Cuba
- (c) Economic Revival of Western Europe; Soviet Union's Relations with Eastern Europe

#### **Module II: Europe, U.S.S.R and U.S.A. (1985-2000)**

- (a) Disintegration of U.S.S.R
- (b) Re-drawing of political borders of Germany, Yugoslavia and Czechoslovakia;  
Emergence of the European Union (EU) in Western Europe
- (c) U.S.A as the dominant world power

#### **Module III: Movements for Equal Rights and Challenging the Bipolar World (1945-2000)**

- (a) Campaigns within and outside South Africa against Apartheid
- (b) Civil Rights Movement in U.S.A
- (c) Non-Aligned Movement

#### **Module IV: Major Trends**

- (a) Globalisation
- (b) Sustainable Development
- (c) Women's Liberation Movement

## References:

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### **Hindi Books**

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# **T.Y.B.A. History**

## **SEMESTER -V**

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

#### **Objectives:**

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.

#### **Module I: History: Definition and Scope**

- (a) History: Meaning, Scope and Nature
- (b) Importance of History
- (c) History and Auxiliary Sciences

#### **Module II: Sources of History**

- (a) Sources: Nature and Types
- (b) Authenticity and Credibility of Sources
- (c) Importance of Archival Sources

#### **Module III: Research Methods in History**

- (a) Methods of Data Collection
- (b) Interpretation and Generalisation of Sources
- (c) Footnotes and Bibliography

#### **Module IV: Sources for Writing Indian History**

- (a) Sources for Ancient Indian History
- (b) Sources for Medieval Indian and Maratha History
- (c) Sources for Modern and Contemporary Indian History

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# **T.Y.B.A. History**

## **SEMESTER -V**

### **Elective Course IX B - Introduction to Heritage Tourism**

#### **Objectives:**

1. To develop an understanding of Heritage Tourism amongst students.
2. To introduce the students to new trends in Heritage Tourism.
3. To prepare the students for careers in Tourism industry.

#### **Module I -Understanding Heritage Tourism**

- (a) Meaning and Historical Perspective of Tourism
- (b) Concept, Scope and Significance of Heritage Tourism
- (c) National Policies to promote Heritage Tourism and World Heritage Sites in India

#### **Module II - Forms of Heritage Tourism in India**

- (a) Natural: Beaches and Sanctuaries
- (b) Built Heritage: Forts, Monuments and Public Buildings
- (c) Cultural: Pilgrimage Sites, Fairs and Festivals

#### **Module III - New Trends in Heritage Tourism**

- (a) Entertainment: Performing Arts and Cinema
- (b) Eco-tourism and Adventure Tourism
- (c) Public Private Partnership in Heritage Tourism

#### **Module IV - Heritage Management**

- (a) Heritage Legislation
- (b) Role of Tourism Industry
- (c) Role of Museums and Heritage Conservation Societies

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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

#### **Objectives:**

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.

#### **Module I: Foundation, Expansion and Decline of the Mughal Rule**

- (a) India on the eve of Mughal Rule; Invasion of Babur
- (b) Humayun, Shershah and Akbar
- (c) Jahangir, Shahjahan and Aurangzeb

#### **Module II: Administrative Structure of the Mughals**

- (a) Central and Provincial Administration
- (b) Mansabdari System
- (c) Revenue and Judicial system

#### **Module III: Rise of the Maratha Power**

- (a) Shivaji and Foundation of Swarajya
- (b) Administration of Shivaji
- (c) Sambhaji, Rajaram and Tarabai

#### **Module IV: Society and Economy, Religion and Culture of the Mughal Rule**

- (a) Society and Economy
- (b) Religion, Education and Literature
- (c) Art and Architecture

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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

#### **Objectives:**

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.

#### **Module I: The Nehru Era (1947 CE – 1964 CE)**

- (a) Features of Indian Constitution
- (b) Integration and Reorganization of Indian States
- (c) Socio- Economic Reforms and Foreign Policy

#### **Module II: Political, Social and Economic Developments (1964 CE – 1984 CE)**

- (a) Political Developments after Nehru Era; Green Revolution.
- (b) Abolition of Privy Purses and Titles; Nationalization of Banks; The Emergency
- (c) Janata Government; Return of Congress to power ; Foreign Policy

#### **Module III: Political, Social and Economic Developments (1984 CE – 2000 CE)**

- (a) Political Developments
- (b) Relations with Neighboring Countries
- (c) Liberalization, Privatization and Globalization

#### **Module IV: Emerging Trends**

- (a) Communalism and Separatist Movements
- (b) Women Empowerment and Policy of Reservation
- (c) Science, Technology and Education

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Agrawal R. C., Bhatnagar Mahesh, *Bhartiya Sanvidhan ka Vikas Tatha Rastriya Aandolan*, S. Chand & Co. Pvt . Delhi, 2014.

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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

Objectives:

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.

#### **Module I: Museology**

- (a) Definition of Museology, Museum Movement in India
- (b) Role of the Curator
- (c) Types of Museums

#### **Module II: Museums**

- (a) Methods of Collection and Conservation of Objects in Museums
- (b) Preservation Techniques and Types of Exhibitions
- (c) Changing Role of Museums: In-house and Out-reach activities of Museums

#### **Module III: Archival Science**

- (a) Meaning, Scope, Objectives and Classes of Archives
- (b) Importance of Archives: Value of Records as Sources of History
- (c) Classification of Records

#### **Module IV: Management of Archives**

- (a) Appraisal and Retention of Records
- (b) Conservation and Preservation of Records
- (c) Digital Archives

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# **T.Y.B.A. History**

## **SEMESTER -VI**

### **Elective Course VI B - Media and Communication**

Objectives:

1. To acquaint students with the various types of Media and Communication.
2. To inform students of the developments in Information Technology.
3. To understand the impact of Media on Society.

#### **Module I: Radio and Television**

- (a) Radio - History and Current Trends
- (b) Television - History and Current Trends
- (c) Careers in Radio and Television

#### **Module II: Advertising and Public Relations**

- (a) Definition, Functions and Responsibilities of Public Relations Officer
- (b) Advertising – Definitions and Types
- (c) Careers and Opportunities in Advertising and Public Relations

#### **Module III: Revolution in Information Technology**

- (a) Social Media
- (b) Electronic Gadgets – Uses and Misuses
- (c) Cyber Crimes and Cyber Laws

#### **Module IV: Impact of Media**

- (a) Impact on Society - Children, Women, Youth
- (b) Challenges – Privatization, Global Competition, Moral Issues, Public Censorship
- (c) Media and Global Issues – Human Rights, Environment



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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

Objectives:

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.

#### **Module I: Expansion of the Maratha Power**

- (a) Rise of the Peshwas: Balaji Vishwanath
- (b) Peshwa Bajirao I
- (c) Maratha Confederacy

#### **Module II: Consolidation of the Maratha Power**

- (a) Peshwa Balaji Bajirao (Nanasaheb)
- (b) Third Battle of Panipat: causes and consequences
- (c) Defeat of the Marathas and significance of the Third Battle of Panipat

#### **Module III: Post Panipat Revival and Downfall**

- (a) Peshwa Madhavrao I
- (b) Barbhai Council
- (c) Downfall of the Maratha Power

#### **Module IV: Administrative and Socio-Cultural Developments**

- (a) Peshwa Administration: Civil, Revenue and Military
- (b) Society under the Peshwas – Religion, Caste and Position of Women
- (c) Cultural Developments: Literature, Art and Architecture

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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

#### Objectives:

- 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.

#### **Module I: Transformation of China**

- (a) Domestic Policy in People's Republic of China under Mao Zedong
- (b) Economic Progress in China under Deng Xiaoping
- (c) Foreign Policy of China with USSR

#### **Module II: Reconstruction of Japan**

- (a) American Occupation of Japan
- (b) Economic Miracle in Japan
- (c) Foreign Policy of Japan with USA

#### **Module III: South East Asia**

- (a) Cold War and Vietnam
- (b) Guided Democracy in Indonesia
- (c) Association of South East Asian Nations (ASEAN)

#### **Module IV: Conflicts in West Asia**

- (a) Arab- Israel Conflict (1948-2000)
- (b) Iranian Revolution of 1979
- (c) Oil Politics and OPEC

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# **T.Y.B.A. History**

## **SEMESTER -VI**

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

Objectives:

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.

#### **Madule I: Historical Research: Methods and Presentation**

- (a) Steps in Historical Research
- (b) Methods of Critical Enquiry
- (c) Presentation of Historical Research

#### **Madule II: New Trends in History**

- (a) Local History
- (b) Oral History
- (c) Digital and E-Sources

#### **Madule III: Approaches to History**

- (a) Subaltern
- (b) Feminist
- (c) Post-Modern

#### **Madule IV: Indian Historiography**

- (a) Imperialist
- (b) Nationalist
- (c) Marxist

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Bodhankar Sudhir, Dr. Olani, *Samajik Sanshodhan Paddhat*

Deo Prabhakar, *Itihas Aik Shastra*, Kalpana Prakashan Nanded, 1997.

Desai Sanjiv P., *Sankalak va Lekhak, Abhilekh Vyavasthapakachi Margdarshika*, Sampadak, Gafur Saikh, *Itihas Lekhan Shashtra*, Pritam Prakashan , Mumbai.

Gaikwad D. , *Itihas Lekhan Paddhat va Aaitihasik Smarake yancha Abhyas*, Phadke.

Gaikwad R. D., *Itihas Lekhan Shashtra*, Phadke Prakashan, Kolhapur.

Ganorkar Prabha, Dahake Vasant Aabaji (Sampadit), Sadnya Sakanlpana Kosh, Popular Prakashan, Mumbai.

Gothal S., *Itihas Lekhan Shashtra, Itihaskar*, Kailas Prakashan Aurangabad.

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Nadgonde Gurunath, *Samajik Sanshodhan Paddhati*, Phadake Prakashan, Solapur.

Patil B V, *Sanshodhan Paddhati*, Mangesh Prakashan , Nagpur.

Rajadarekar Suhas, *Itihas Lekhan Shastra*, Vidhya Prakashan, Nagpur.

Rajadhyksha Vijaya, (Sampadit), Sadnya Sakanlpana Kosh, Maharashtra Rajya Sahitya Va Sanskriti Mandal, Mumbai.

Raut Ganesh (Sampadit), Dattak Gavancha Itihas, Khand 1,2,3, Pune Vidhyapith, Pune, 1999.

Sardesai B. N., Atharavya Shatakatil Marathyancha Itihas – Nava Drushtikon, Phadke

Sardesai B. N., *Itihaslekhanpaddhati*, Phadke Prakashan, Kolhapur, 2005.

Sawant B. T., Salunkhe D., *Aaitihasik Kagad Patre va Thale*, Mehata Publishing House, Wamburkar Jaswandi, Ithihas Lekhanatil Nave Pravah, Daimond Prakashan, Pune, 2014.

# **T.Y.B.A. History**

## **SEMESTER -VI**

### **Elective Course IX B - Heritage Tourism in Maharashtra**

#### **Objectives:**

1. To introduce students to the Cultural Heritage of Maharashtra
2. To understand various resources of Heritage Tourism in Maharashtra
3. To acquaint the students with the relevance and scope of Heritage Tourism

#### **Module I: Understanding Heritage Tourism of Maharashtra**

- (a) Government Policies and Role of Government Agencies
- (b) Heritage Sites and Precincts
- (c) Careers in Heritage Tourism

#### **Module II: Natural Heritage**

- (a) Biodiversity of Sahyadri Range
- (b) National Parks
- (c) Beaches and Hill Stations

#### **Module III: Architectural Heritage**

- (a) Caves
- (b) Forts
- (c) Monuments and Public Buildings

#### **Module IV: Cultural Heritage**

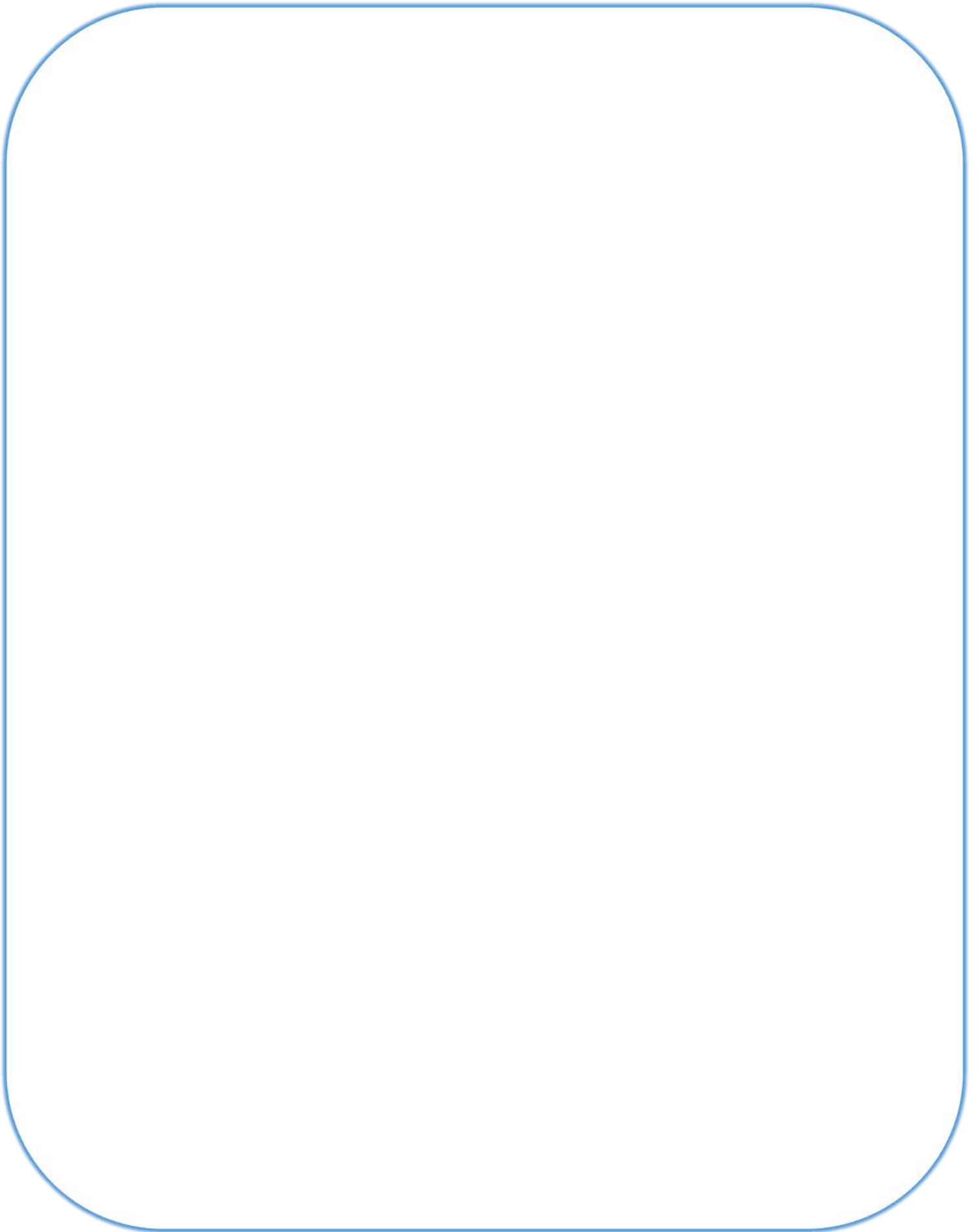
- (a) Pilgrimage Sites
- (b) Fairs and Festivals
- (c) Folk and Tribal Culture

## References:

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- Buck C H, *Faiths, Fairs and Festivals of India*, Winsome Books India, Delhi, 2005
- Dehejia Vidya, *Early Buddhist Rock Temples: A Chronological Study*, Thames and Hudson, 1972
- Dhavalikar M K, *Cultural Heritage of Mumbai*, Chhatrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai, 2016
- Dwivedi S and Mehrotra, R. *Bombay: The Cities Within*, India Book House, Bombay 1995.
- Feldhaus Ann, *Connected Places: Region, Pilgrimage, and Geographical Imagination in India*, Palgrave Macmillan, New York, 2003
- Flanagan Wendy, *Careers in Tourism*, Heinemann Publishers, Johannesburg, 2002
- Gunaji Milind, *Off beat Tracks in Maharashtra*, Popular Prakashan, Mumbai, 2003
- Jamkhedkar A P, *Ajanta*, Oxford University Press, 2009
- Michell George, *Buddhist Rock Cut Monasteries of Western Ghats*, Jaico Publishing House, Delhi, 2018
- Michell George, *Elephanta*, Jaico, Delhi, 2014
- Naravane M S, *Forts of Maharashtra*, APH Publishing Corporation, New Delhi, 1995
- Pande Pratibha, *National Parks and Sanctuaries in Maharashtra: A State Profile*, Bombay Natural History Society, 2005
- Pandit Suraj, *Stories in Stone: Historic Caves of Mumbai*, INSTUCEN Trust, Mumbai, 2013
- Rohatgi Pauline and Godrej Pheroja, Mehrotra Rahul, *Bombay to Mumbai*, Marg Publications, Mumbai, 1997.
- Tomar Y P S, *Development of Primitive Tribes in Maharashtra: Status, Continuity, and Change*, Tribal Research and Training Institute, 2004

## Marathi Books

- Awalskar S.V., *Raigadachi Jeevankatha*, Maharashtra Rajya Sahitya aani Sanskruti Mandal, 1995 (Third Edition)
- Dalvi Dawood, *Leni Maharashtrachi*, GranthaliPrakashan, Mumbai, 2004
- Deshpande D. G., *Maharashtratil Kille*, Diamond Publication, Pune, 2009
- Degalurkar G. B., *Verul Darshan*, SnehalPrakashan, Pune, 2008
- Degalurkar G. B., *Gharapuri Darshan*, SnehalPrakashan, Pune, 2013
- Deglurkar G B, Paithan: *Samskrutik Darshan*, Bhartiya Itihas Sankalan Samiti, Pune, 2005
- Ghanekar P K, *Atha to Durgjidyasa*, Snehal Prakashan, Pune, 1999 (second edition)
- Gunaji Milind, *Mazi Mulukhgiri*, Rajhans Prakashan, Pune, 2001 (Fifth Edition)
- Pandit Suraj, *Maharashtratil Bauddha Leni*, Aparant, Pune, 2018
- Paradkar Milind, *Prachin Bharatiya Durgashastra Aani Hindavi Swarajyachya Don Rajdhanya-Ek Tulanatmak Abhyas*, Neelchampa Prakashan, 2011.





**PREAMBLE:**

The syllabus has been revised in view to understand recent trends in the subject of economics .The Board of Studies in Economics has revised the syllabi of papers at the TYBA which will be made effective from the Academic Year 2018-19. In this revision, some of the existing optional papers have been replaced by new papers. A broad overview of the structure, followed by the syllabi of individual papers, is given below.

**DURATION:**

- The course shall be a full time course.
- The duration of B.A. course shall be of Three years /Six Semesters.

FYBA: SEMESTER – I & II (One paper each semester)

SYBA: SEMESTER – III & IV (Two papers each semester)

TYBA: SEMESTER – V & VI (Six papers each semester)

**PATTERN:**

The T.Y.B. A. [Entire Economics] Course shall have 12 papers. Every semester shall have six papers, each carrying 100 marks. However students can opt combination of any two subjects (Economics and any other subject). Every semester shall have three papers of each subject, carrying 100 marks.

**SCHEME OF EXAMINATION:**

- **Duration – Three Hours** for each paper.
- There shall be five questions each of 20 marks.
- All questions shall be compulsory with internal choice within the questions.
- Questions may be subdivided into sub-questions a, b, c and the allocation of marks shall depend on the weightage given to the topic.

<b>Questions</b>	<b>Modules</b>	<b>Marks</b>
Qu.1	Unit I	20
Qu.2	Unit II	20
Qu.3	Unit III	20
Qu.4	Unit IV	20

Qu.5	4 sub-questions from Unit I, II, III & IV	20
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**COURSE STRUCTURE (APPLICABLE FROM ACADEMIC YEAR 2018 – 2019)**

**TYBA (SEMESTER – V)**

<b>COURSE CODE</b>		<b>REVISED PAPER</b>	<b>CREDIT</b>	<b>MARKS</b>
<b>GROUP-I</b>		<b>COMPULSORY PAPERS</b>		
<b>ECOMIC501</b>	<b>VII</b>	<b>MICROECONOMICS III</b>	<b>4</b>	<b>100</b>
<b>ECODEV502</b>	<b>VIII</b>	<b>ECONOMICS OF DEVELOPMENT</b>	<b>4</b>	<b>100</b>
<b>GROUP-II</b>		<b>ELECTIVE PAPERS</b>		
<b>ECOFEA503</b>	<b>IX</b>	<b>FINANCIAL ECONOMICS</b>	<b>3</b>	<b>100</b>
		<b>OR</b>		
<b>ECOEHIB503</b>	<b>IX</b>	<b>ECONOMIC HISTORY OF INDIA:1857-1947</b>	<b>3</b>	<b>100</b>
		<b>OR</b>		
<b>ECOILEC503</b>	<b>IX</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS</b>	<b>3</b>	<b>100</b>
<b>ECOMSEAA504</b>	<b>X</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS</b>	<b>4</b>	<b>100</b>
		<b>OR</b>		
<b>ECOMMEB504</b>	<b>X</b>	<b>MATHEMATICAL METHODS IN ECONOMICS</b>	<b>4</b>	<b>100</b>
		<b>OR</b>		
<b>ECOREMC504</b>	<b>X</b>	<b>RESEARCH METHODOLOGY</b>	<b>4</b>	<b>100</b>
		<b>OR</b>		
<b>ECOEACD504</b>	<b>X</b>	<b>ECONOMICS OF AGRICULTURE AND COOPERATION</b>	<b>4</b>	<b>100</b>
<b>ECOITEA505</b>	<b>XI</b>	<b>INTRODUCTION TO ECONOMETRICS</b>	<b>4</b>	<b>100</b>

<b>OR</b>				
<b>ECOENVEB505</b>	<b>XI</b>	<b>ENVIRONMENTAL ECONOMICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOPROA506</b>	<b>XII</b>	<b>PROJECT</b>	<b>3</b>	<b>100</b>

**TYBA (SEMESTER –VI)**

<b>COURSE CODE</b>		<b>REVISED PAPER</b>	<b>CREDIT</b>	<b>MARKS</b>
<b>GROUP-I</b>		<b>COMPULSORY PAPERS</b>		
<b>ECOMAE601</b>	<b>XIII</b>	<b>MACROECONOMICS III</b>	<b>4</b>	<b>100</b>
<b>ECOINE602</b>	<b>XIV</b>	<b>INTERNATIONAL ECONOMICS</b>	<b>4</b>	<b>100</b>
<b>GROUP-II</b>		<b>ELECTIVE PAPERS</b>		
<b>ECOIFSA603</b>	<b>XV</b>	<b>INDIAN FINANCIAL SYSTEM</b>	<b>3</b>	<b>100</b>
<b>OR</b>				
<b>ECOIETB603</b>	<b>XV</b>	<b>INDIAN ECONOMIC THOUGHT</b>	<b>3</b>	<b>100</b>
<b>OR</b>				
<b>ECOILEC603</b>	<b>XV</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS</b>	<b>3</b>	<b>100</b>
<b>OR</b>				
<b>ECOMSEA604</b>	<b>XVI</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOAEB604</b>	<b>XVI</b>	<b>APPLIED ECONOMETRICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOREMC604</b>	<b>XVI</b>	<b>RESEARCH METHODOLOGY</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOEACD604</b>	<b>XVI</b>	<b>ECONOMICS OF AGRICULTURE AND COOPERATION</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOITEA605</b>	<b>XVII</b>	<b>INTRODUCTION TO ECONOMETRICS</b>	<b>4</b>	<b>100</b>

<b>OR</b>				
<b>ECOPUEB605</b>	<b>XVII</b>	<b>DEVELOPMENT THEORY AND EXPERINENCE</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOPEG605</b>	<b>XVII</b>	<b>POLITICAL ECONOMY OF GLOBALIZATION</b>	<b>4</b>	<b>100</b>
<b>ECOPROA606</b>	<b>XVIII</b>	<b>PROJECT</b>	<b>3</b>	<b>100</b>

### **MICROECONOMICS III: PAPER VII**

**Preamble:**

The course is designed to provide sound training in microeconomic theory. Since students have already studied the perfect competition, the focus of this course is on the study of imperfect completion and general equilibrium and welfare economics.

#### **SEMESTER –V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECOMIC501</b>	<b>MICROECONOMICS III: PAPER VII</b>	<b>4</b>	<b>100</b>

**Module I:** Monopoly – sources of monopoly - Profit maximising monopoly – calculation of price, output and profit for a monopoly – price discrimination: First and third degree-public policy towards monopoly.

**Module II:** Basics of Game theory – Prisoner’s dilemma – dominant strategy equilibrium – Battle of sexes game – Nash equilibrium – Extensive form games – game tree - Solving finite extensive form game.

**Module III:** Oligopoly – the Cournot model – the Bertrand model - the Edgeworth model – the Chamberlin model – the Kinked demand curve model – Collusion and Cartels – Price Leadership.

**Module IV:** General Equilibrium and Welfare Economics – Interdependence in the Economy – General Equilibrium and its Existence -The Pareto Optimality Condition of Social Welfare,

Marginal Conditions for Pareto Optimal Resource Allocation, Perfect Competition and Pareto Optimality - Kaldor- Hicks Compensation Criterion - Arrow's Impossibility Theorem.

**References:**

1. Koutsoyannis, Modern Microeconomics, Macmillan Press Ltd., London.
2. Mankiw, N. Gregory, Principles of Microeconomics, 7<sup>th</sup> edition, Cengage Learning, 2015
3. Mansfield, Edwin; Micro-economics: Theory & Applications, 5<sup>th</sup> edition, W.W. Norton & Company, New York, 1985.
4. Sen Anindya (2007), Microeconomics: Theory and Applications, Second edition Oxford University Press, New Delhi, 2007.
5. Salvatore, D.; Microeconomics : Theory and Applications , New Delhi Oxford, New Delhi, Oxford University Press 2006.
6. R.Gibbons (1992) : A Primer in Game Theory, Harvester Wheatsheaf.

**MACROECONOMICS III: PAPER XIII**

**Preamble:**

This course introduces the students to formal modelling of a macroeconomic theory with analytical tools. It discusses goods market with fixed exchange rate, the money market, uncovered interest rate parity and the benefits and costs of fixed and flexible exchange rate

**SEMESTER –VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECOMAE601</b>	<b>MACROECONOMICS III: PAPER XIII</b>	<b>4</b>	<b>100</b>

**Module 1: The Goods Market in the Open Economy**

Trade Balance and its implications for GDP calculations; Export and Import Functions; The Real Exchange Rate and why it matters; Why equilibrium GDP is consistent with a trade imbalance; Fiscal and Exchange Rate Policy with a Fixed Exchange Rate

## **Module 2: Money/Financial Markets and Mundell-Fleming**

The LM equation for the open economy; Uncovered Interest Parity and its implications for exchange rate determination; The combined IS/LM/UIP model; Fiscal and Monetary Policy under Fixed and Flexible Exchange Rates; The Mundell-Fleming trilemma

## **Module 3: Exchange Rate Regimes & Exchange Rate Crises**

The choice of regime, Fixed or Flexible; The spectrum of arrangements from Hard Peg at one end to Fully Floating at the other; Why the Balance of Payments must always balance under Floating Exchange Rates but need not balance under a Fixed or Managed Exchange Rate regime; The operational aspects of fixing; How a fix might come apart; Exchange Rate crises; The relation between Exchange Rate crises and other kinds of crises (banking crises, financial crises, etc.)

## **Module 4: International Monetary History, 1900-present**

The Gold Standard; The Inter-War Period and the Great Depression; The key issues debated at Bretton Woods and the system that emerged as a result of those debates; 1971 and the collapse of the Bretton Woods system; Fixing in Europe via ERM, and the Dollar Standard elsewhere; The Maastricht Treaty and preparations for the Euro; The Global Financial Crisis and its consequences for the Euro; The Euro Crisis; Chinese ambitions in the present day

## **References:**

1. Blanchard, Oliver; *Macroeconomics* (4<sup>th</sup> edition, 9<sup>th</sup> impression), Pearson education, New Delhi, India.
2. Dornbusch R S, Fischer and R Startz; *Macroeconomics*, 8e Tata Mc Grow Hill, New Delhi 2004.
3. Froyen, R. T.; *Macroeconomics : Theory and Policy*, Pearson Education Asia, Delhi 2001.
4. Mankiw, Gregory; *Macroeconomics*, 6e, Worth Publishers, New York, 2003.
5. Salvatore, D.; *International Economics*, Printice Hall, New York, 1997 .
6. Robert Feenstra & Alan Taylor, *International Macroeconomics*, 2<sup>nd</sup> ed.
7. Yannis Varoufakis, *The Global Minotaur*

## **ECONOMICS OF DEVELOPMENT: PAPER VIII**

### **SEMESTER –V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECODEV502</b>	<b>ECONOMICS OF DEVELOPMENT: PAPER VIII</b>	<b>4</b>	<b>100</b>

#### **Module 1:** Concepts of Economic Growth and Development

Meaning of Growth and Development, Distinction between growth & development, Concept of human development, HDI, GDI, Sustainable development, Green GDP, Three core values of development, Capabilities & functioning

#### **Module 2:** Structural Issues in Development Process

Big push theory, Theory of human capital, Role of Education, health & nutrition in economic development, Schumpeter's theory of development, dual economy models of growth, Solows growth model

#### **Module 3:** Inequality, Poverty and Development

Measures of poverty and inequality, Kuznets inverted U-hypothesis, Policy options for poverty alleviation, Inclusive growth, Rural credit institutions.

#### **Module 4:** Technology and Economic Development

Role of Infrastructure in economic development, Role of technology in economic development, types of technical progress, Intermediate/ Appropriate technology, Green technology,

#### **References:**

- 1 Todaro, Michael P. and Stephen C. Smith. Economic Development, 8e. Delhi: Pearson Education, 2003.
2. Thirlwall, A.P. Growth and Development 8e. New York: Palgrave MacMillan, 2005.
3. Meier, Gerald M. and James E. Rauch. Leading Issues in Economic Development, 8e. New Delhi: Oxford Univ. Press, 2006.

## INTERNATIONAL ECONOMICS: PAPER XIV

### Preamble

This course develops a systematic exposition of models that try to explain the composition, direction, and consequences of international trade, and the determinants and effects of trade policy. It then builds on the models of open economy macroeconomics developed in courses 08 and 12, focusing on national policies as well as international monetary systems. It concludes with an analytical account of the causes and consequences of the rapid expansion of international financial flows in recent years. Although the course is based on abstract theoretical models, students will also be exposed to real-world examples and case studies.

### SEMESTER –VI

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECOINE602</b>	<b>INTERNATIONAL ECONOMICS: PAPER XIV</b>	<b>4</b>	<b>100</b>

### Module 1: Introduction

What is international economics about? An overview of world trade.

### Module 2: Old Theories of International Trade

The Ricardian, specific factors, neoclassical trade theory and Heckscher-Ohlin models, Stolper-Samuelson theorem.

### Module 3: New trade theories of International Trade

Monopolistic competition and trade-firm heterogeneity, FDI and the global supply chain

### Module 4: Trade Policy

Instruments of trade policy; Why countries cooperate and GATT, GATS, Regional Trade Agreements-controversies in trade policy (labor standards, IPR and environment)

### References:

1. Paul Krugman, Maurice Obstfeld, and Marc Melitz, *International Economics: Theory and Policy*, Addison-Wesley (Pearson Education Indian Edition), 9th edition, 2012.
2. Dominick Salvatore, *International Economics: Trade and Finance*, John Wiley International Student Edition, 10th edition, 2011.



3 Gordon Hanson, “The Rise of Middle Kingdoms: Emerging Economies in Global Trade”, *Journal of Economic Perspectives*, Spring 2012.

4 Melitz M. and Trefler D., “Gains from Trade When Firms Matter”, *Journal of Economic Perspectives*, Spring 2012.

### **FINANCIAL ECONOMICS: PAPER IX**

#### **Preamble:**

The course introduces students to the economics of Finance. It aims at imparting knowledge about the basic models of investment and portfolio analysis, including the CAPM. The valuation of assets, derivatives & options is to be studied in addition to patterns of corporate financing.

#### **SEMESTER – V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOFEA503</b>	<b>FINANCIAL ECONOMICS: PAPER IX</b>	<b>3</b>	<b>100</b>

#### **Module1: Investment & portfolio Analysis**

Basic theory of interest, discounting & present value; internal rate of return, evaluation criteria , fixed income securities; bonds prices & yields. Structure of interest rate, yield curves, spot & forward rates. Portfolio of assets, random asset returns, Mean variance portfolio analysis, The Markowitz Model & two fund theorem.

#### **Module 2: CAPM**

The capital Market line, the CAP Model, the beta of an asset & of a portfolio, security market line, CAPM model in investment & pricing formula.

#### **Module 3: Options & Derivatives**

Meaning & types of derivatives: forward contracts, futures - forward & future prices, stock index futures, interest rate futures, future for hedging. Options & Swaps and their types- Option market: call & put options, option trading strategies- spreads, straddles, strips & straps, strangles, the principle of arbitrage. Participants of derivatives market- hedgers, speculators, arbitrageurs.

## **Module 4: Corporate Finance**

Patterns of corporate financing: stock, debt, preferences, convertibles. Capital structure & the cost of capital, corporate debt & dividend policy, the Modigliani –Miller theorem.

### **Readings:**

1. David Luenberger (1997); Investment Science, Oxford University Press.
2. Hull John C. (2005); Options, Futures and other derivatives, Pearson Education 6<sup>th</sup> Edition.
3. Thomas Copeland, J. Fred Weston and Kuldeep Shastri (2003); Financial Theory and Corporate Policy, Prentice Hall 4<sup>th</sup> Edition.
4. Richard Brealey and Stewart Myers (2002); Principles of Corporate Finance, McGraw Hill 7<sup>th</sup> Edition.
5. Stephen Ross and Bradford Jordan (2005); Fundamentals of Corporate Finance, McGraw Hill 7<sup>th</sup> Edition.
6. William Sharpe, Gordon Alexander and J. Bailey (2003); Investment, Prentice Hall of India 6<sup>th</sup> Edition.

## **INDIAN FINANCIAL SYSTEM: PAPER XV**

**Preamble:** The basic purpose of this paper is to acquaint students with various components of the Indian financial system, its working and the trends and turns that have taken place over the years especially since financial sector reforms.

### **SEMESTER – VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOIFSA603</b>	<b>INDIAN FINANCIAL SYSTEM : PAPER:XV</b>	<b>3</b>	<b>100</b>

### **Module I: Indian Financial System: Structure, Trends and Turns** (10 lectures)

Meaning and components of the Financial System - Financial System and Economic Development - Indicators of Financial Development: FR, FIR, NIR and IR. – Overview of financial sector reforms since 1990s – Trends and turns in Indian financial sector: 1950-2017.

### **Module II: Banking in India since 1990s** (10 lectures)

Developments in Commercial banking sector since 1990s – Management of Non-Performing Assets (NPAs); Capital Adequacy Norms - Basel Accord III.- Monetary policy of the RBI –Changes in RBI monetary policy since 1990s - Transmission Channels of Monetary policy.

**Module III: Money and Capital Markets in India** (10 lectures)

Money Market: Components of organized money market – Reforms in the money market - Features of Indian Money Market.

Capital Market: Structure of the Indian Capital Market – Recent Developments in the Capital Market – Role of SEBI - Interlink between Money Market and Capital Market - Overview of Debt Market in India.

**Module IV: Non-Banking sector of the Financial System** (10 lectures)

Non-Bank Finance Companies (NBFCs) in India and their progress - Developments in India's Insurance sector – Progress of Mutual Funds industry in India - Credit Rating Agencies in India.

**References:**

1. Pathak, Bharati (2008): The Indian Financial System –Markets, Institutions, and Services, (2<sup>nd</sup> Edition), Pearson Education, New Delhi.
2. Bhole, L. M. (2008): Financial Institutions and Markets, Growth and Innovation, Tata McGraw-Hill, New Delhi.
3. Khan, M.Y. (2007): Financial Services, Tata McGraw Hill, New Delhi.
4. Reserve Bank of India (various issues) Report on Currency and Finance, RBI, Mumbai.
5. Rakesh Mohan & Partha Ray (2017), Indian Financial Sector: Structure, Trends & Turns; IMF Working Paper (WP/17/7). (<https://www.imf.org> > Issues > 2017/01/20).

**ECONOMIC HISTORY OF INDIA: 1857-1947: PAPER IX**

**Preamble:**

This course analyses key aspects of Indian economic development 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.

## SEMESTER – V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOEHIB503	ECONOMIC HISTORY OF INDIA: 1857-1947 : PAPER IX	3	100

### **Module1: Growth and Structural Change 1857-1947**

Measuring Change-Explaining Change-Globalisation and patterns of trade-Saving and Investment-Public Finance -Balance of Payments

### **Module 2: Agriculture and the Commons**

Trends in Production and Income-Resources, Regional dimensions of agriculture- land, labour and credit markets- forests and forest-dependent peoples-village commons and pastures-land use patterns

### **Module 3: Industry**

Long term patterns of small scale industrialisation and its interpretation- handloom, weaving and other industries- labour and capital in traditional small scale industry- modern small scale industry- statistical outline of large scale industry- stages of industrialisation and major industries- labour, finance, entrepreneurship and management in large scale industry

### **Module 4: Infrastructure, Fiscal and Monetary systems:**

Impetus- Irrigation- Railways- Roads and Internal Waterways- Ports- Post and Telegraph- Power- Legal- systems Economic policy and policy making-Trade policy- Fiscal systems- Monetary system- prices.

### **References:**

1. Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3<sup>rd</sup> edition,2011.
2. S.Sivasubramonian, *National Income of India in the Twentieth Century*, Oxford University Press,2000
3. Sumit Guha (ed.), *Growth, Stagnation or Decline?*, Delhi , Oxford University Press,1993
4. A.K. Banerji, *India's Balance of Payments*, Bombay: Asia Publishing House,1962.

5. George Blyn, *Agricultural Trends in India, 1891-1947: Output, Availability and Productivity*, Philadelphia: University of Pennsylvania press, 1966
6. M.Gadgil and R. Guha, *The Fissured Land: An Ecological History of India*, Delhi: Oxford University Press, 1992.
7. Alice Thorner, 'The Secular Trend in the Indian Economy, 1881-1951', *Economic Weekly*, vol.14, 1962.
8. Dharma Kumar, "The Fiscal System" in *The Cambridge Economic History of India*, Dharma Kumar (ed.), vol. 2, pp.905-46, Cambridge, 1983.
9. M.J.K.Thavaraj, 'Capital Formation in the Public Sector in India: A Historical Study, 1898-1938', in *Papers on National Income and Allied Topics*, V.K.R.V.Rao(ed.), Delhi: Allied Publishers, 1962.

### **INDUSTRIAL AND LABOUR ECONOMICS: PAPER IX**

**Preamble:**

There has been a paradigm shift in the structure of the Indian industrial sector and the policies governing it ever since the new era of globalisation and liberalisation has ushered in. This paper intends to equip the students with the knowledge about the fundamentals of Industrial Economics and also the latest policies relating to the Indian industry.

#### **SEMESTER V**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOILEC503</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS: PAPER IX</b>	<b>3</b>	<b>100</b>

**Module 1: Introduction**

Meaning and Scope of Industrial Economics, Industrial Profile : Private sector - Performance and Problems; Cooperatives - features, types, merits and demerits; Public Sector - Role, Performance and Problems, Diversification and Industrial Combinations - Motives for Mergers and Acquisitions

## **Module 2: Industrial Location and Problem of Regional Imbalance**

Determinants of Industrial Location, Theories of Industrial Location - Weber's and Sargent Florence's Theories, Dispersion of Industries and the Problem of Regional Imbalance

## **Module 3: Industrial Productivity and Industrial Sickness**

Concept and Measurement of Industrial Productivity, Factors Affecting Industrial Productivity, Industrial Sickness - Causes, Effects and Remedial Measures, Rationalisation - Concept, Aspects and Impact

## **Module 4: Industrial Development in India**

New Industrial Policy, 1991; Disinvestment Policy; Micro, Small and Medium Enterprises Development Act, 2006; National Manufacturing Policy, 2011, Recent Trends in India's Industrial Growth, Role of MNCs in the Indian Economy - Merits and Demerits, Issues in Industrial Proliferation and Environment Preservation; Pollution Control Policies

## **References:**

- Agrawal A.N. (2011), Indian Economy, New Age International Publishers, New Delhi
- Barthwal R.R. (2007), Industrial Economics, New Age International Publishers, New Delhi
- Cherunilam, F. (1994), Industrial Economics: Indian Perspective, Himalaya Publishing House, Mumbai
- Datt R. and Sundaram K.P.M. (2009), Indian Economy, S.Chand & Co., New Delhi
- Desai S.S.M. and Bhalerao N (2008), Industrial Economy of India, Himalaya Publishing House, Mumbai
- Ekbote Vidya and Ekbote Vilas (1999), Industrial Economics, Anmol Publication, Pune
- Kuchhal S.C. (1980), Industrial Economy of India, Chaitanya Publishing House, Allahabad
- Mishra S.K. and Puri V.K.(2008), Indian Economy, Himalaya Publishing House, Mumbai
- Ranjana Seth, Industrial Economics (2010), Ane Books Pvt. Ltd., New Delhi
- Reasons Behind Mergers
- National Manufacturing Policy, 2011 - Department Of Industrial ...

- The Micro, Small and Medium Enterprises Development Act, 2006 .
- Micro, Small and Medium Enterprises (MSMEs) in India: An Appraisal
- Industrial Growth and the Environment - of Planning Commission

PREVENTION AND CONTROL OF POLLUTION - Ministry of ...

- Sinha V.C., Sinha P. and Sinha V. (2001), Industrial Economics, Lokbharati Publication, 15 - A, Mahatma Gandhi Marg, Elahabad
- Raykhelkar A.R. and Damji B.H. (2011), Industrial Economics, Vidya Books Publication, Aurangabad, Maharashtra

### **INDIAN ECONOMIC THOUGHT: PAPER XV**

#### **Preamble:**

The history of Indian economic thought provides rich insights into both economic issues and the workings of the Indian mind. It will give the student an introduction to major Indian thinkers and their ideas on Indian economic policy.

#### **SEMESTER VI**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOIETB603</b>	<b>INDIAN ECONOMIC THOUGHT: PAPER XV</b>	<b>3</b>	<b>100</b>

#### **Module 1: The Modernists**

Naoroji:-Drain theory, criticism and long run relevance, Ranade's views on railway investment and the methodology of Indian economics, Gokhale:-Gokhale and the economics of education, the rupee ratio debate , Dr. Ambedkar's contribution to the rupee debate

#### **Module 2: Agriculture, Poverty and Famines**

Why famines occur, famine policy, criticism of famine policy, Ranade's views on Poverty and Industrialisation, agrarian policy, contribution of Dr. Ambedkar

#### **Module 3: Economic Policy after Independence**

Nehruvian economics –Mahalonobis model and planning, industrial stagnation, industry and trade, agriculture and the wage goods model , reappraisal of Nehru’s economics

#### **Module 4: Economic Thought in Contemporary India**

Measurement of poverty, liberalisation, privatisation and globalisation, Human development and Amartya Sen’s contribution, Jagadish Bhagawati’s contribution.

#### **References:**

1. Jadhav Narendra (2015) : AMBEDKAR : An Economist Extraordinaire , Konark Publishers, New Delhi
2. Dasgupta A.K.(1993) : A History of Indian Economic Thought , Routledge.
3. Balkrishnan P. (2007) : The Recovery of India: Economic Growth in the Nehru Era, Economic and Political Weekly, Vol. 42, No. 45/46 (Nov. 10 - 23, 2007), pp. 52-66
4. A.Sen : Development as capabilities Expansion, [http://morgana.unimore.it/Picchio\\_Antonella/Sviluppo%20umano/svilupp%20umano/Sen%20development.pdf](http://morgana.unimore.it/Picchio_Antonella/Sviluppo%20umano/svilupp%20umano/Sen%20development.pdf)
5. A.Pangariya: Why Growth Matters: How India’s Growth Acceleration has Reduced Poverty, [http://www.cde.org.za/wp-content/uploads/2013/09/Prof%20Arvind%20Panagariya\\_Why%20growth%20matters\\_%20How%20Indias%20growth%20acceleration%20has%20reduced%20poverty.pdf](http://www.cde.org.za/wp-content/uploads/2013/09/Prof%20Arvind%20Panagariya_Why%20growth%20matters_%20How%20Indias%20growth%20acceleration%20has%20reduced%20poverty.pdf)
6. Deaton Angus(2013) : What is Going on in India, [https://scholar.princeton.edu/sites/default/files/deaton/files/deaton\\_book\\_review\\_sen\\_dreze\\_etc\\_lancet\\_2013\\_0.pdf](https://scholar.princeton.edu/sites/default/files/deaton/files/deaton_book_review_sen_dreze_etc_lancet_2013_0.pdf)
7. A. Pangariya ( 2013): Indian Economy: Retrospect and Prospect, <http://www.pc.gov.au/news-media/lectures/arvind-panagariya/snape-2013-panagariya.pdf>

#### **INDUSTRIAL AND LABOUR ECONOMICS: PAPER XV**

**Preamble:**



Issues pertaining to the labour market, wage policy, trade unions and amicable solutions to industrial disputes have become vital for developing countries, especially for India, where the bulk of the labour force is employed in the unorganised sector, and the organized sector is witnessing a phenomenon of ‘jobless’ growth. This paper intends to provide knowledge of the same and also discusses the importance of labour welfare and social security measures for the growing labour force in India.

### SEMESTER – VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOILEC603</b>	<b>INDUSTIRAL AND LABOUR ECONOMICS: PAPER XV</b>	<b>3</b>	<b>100</b>

#### **Module I – Introduction – Indian Labour Market**

- Characteristics of the Indian Labour Market
- Child Labour and Female Labour – Problems and Measures
- Globalisation and Indian Labour Market
- Labour Market Reforms – Exit Policy and Need for Safety Nets
- Second National Commission on Labour

#### **Module II – Trade Unionism**

- Definition and Functions of Trade Unions
- Historical Evolution of Trade Unions in India and Their Present Status
- Problems of Trade Unions in India
- Role of Outside Leadership

#### **Module III – Industrial Relations**

- Causes of Industrial Disputes and Their Settlement Mechanism
- Collective Bargaining – Concept, Features, Importance and Pre-requisites for Successful Collective Bargaining
- Collective Bargaining in India
- Workers’ Participation in Management – Concept, Objectives and Forms of Workers’ Participation in India

#### **Module IV – Labour Welfare and Social Security**

- Concept, Theories and Principles of Labour Welfare
- Agencies for Labour Welfare
- Role of the Labour Welfare Officer
- Social Security – Concept; Social Assistance and Social Insurance
- Social Security Measures in India
- International Labour Organisation and Its Impact on Indian Labour Legislations

**References:**

- Agrawal A.N. (2011), Indian Economy, New Age International Publishers, New Delhi
- Datt R. and Sundaram K.P.M. (2009), Indian Economy, S.Chand & Co., New Delhi
- Mamoria C.B. and Mamoria S. (2002), Dynamics of Industrial Relations, Himalaya Publishing House, Mumbai
- Mishra S.K. and Puri V.K.(2008), Indian Economy, Himalaya Publishing House, Mumbai
- Monappa A, (2006), Industrial Relations, Tata McGraw Hill Publishing Company Ltd., New Delhi
- Punekar S.D., Deodhar S.B. and Sankaran Saraswathi (2004), ‘Labour Welfare, Trade Unionism and Industrial Relations’, 2004
- Ratna Sen, Industrial Relations in India - Shifting Paradigms (2005), Macmillan, New Delhi
- Singh J.K. (1998), Labour Economics – Principles, Problems and Practices, Deep andDeep Publications Pvt. Ltd., New Delhi
- Sinha P.R.N., Sinha I.B. and Shekar S.P. (2006), Industrial Relations, Trade Unions and Labour Legislation, Pearson Education, New Delhi
- Sarma A.M. (2002), Industrial Relations, Himalaya Publishing House, Mumbai

**MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS:**

**PAPER X**

**Preamble**

A plethora of data has emerged at an exponential rate and it is the description, interpretation and understanding of these data and drawing of accurate conclusions that is imperative for a student of Economics. The aim of this paper is to provide students with the mathematical and statistical skills and understanding needed for ‘knowing why’ and ‘when’ to apply these techniques.

### SEMESTER V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOMSEAA504</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS: PAPER X</b>	<b>4</b>	<b>100</b>

#### Module 1:

(Lectures 13)

##### **A: Microeconomic applications of equations and graphs**

- Linear and non-linear relationships in economic analysis
- Market demand and supply models, taxes, elasticity

##### **B: Derivatives and their applications in various areas of economic analysis**

- Derivatives
- Higher order derivatives
- Increasing and decreasing functions; Necessary and sufficient conditions for maxima and minima
- Optimisation of economic functions

#### Module 2: Linear Algebra

(Lectures 10)

- Matrices and basic operations on matrices
- Rank of a matrix
- Inverse of a matrix
- Cramer’s rule
- Input-Output Analysis and policy implications
- Linear Programming Problem: Formulation and graphical solution

#### Module 3:

(Lectures 12)

##### **A: Descriptive Statistics and graphing techniques for presenting data**

- Concept of primary and secondary data along with tabulation and graphs

- Measures of central tendency (only arithmetic-mean, median, and mode).
- Absolute and relative measures of dispersion (range, quartile deviation, mean deviation and standard deviation) with simple applications.
- Measures of skewness and kurtosis.
- Lorenz Curve

### **B: Commercial Statistics**

- Brokerage, Commission and Insurance

### **Module 4: Elementary Probability Theory**

(Lectures 10)

- Sample space and events
- Mutually exclusive, exhaustive and complimentary events
- Conditional probability
- Binomial probability distribution
- Nature and Properties of the Normal Probability Distribution; Standard Scores and the Normal Curve; The Standard Normal Curve: Finding Areas when the Score is Known, Finding Scores when the Area is Known

### **References:**

1. Dowling Edward T: Introduction to Mathematical Economics, Schaum Outline Series in Economics, Tata McGraw -Hill, New Delhi, 2004.
2. Dowling Edward T: Theory and Problems of Mathematical Methods for Business and Economics, McGraw –Hill, 1993.
3. Gupta S.P.: Statistical Methods, S. Chand, New Delhi.
4. Lerner Joel J and P.Zima: Theory and Problems of Business Mathematics, McGraw Hill, New York, 1986.
5. Pfitzner Barry C.: Mathematical Fundamentals of Microeconomics, Biztantra, New Delhi, 2003.
6. Sancheti D.C. and V.K. Kapoor: Statistics-Theory, Methods and Applications, S. Chand, New Delhi
7. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.

8. Wisniewski Mik: Mathematics for Economics-An integrated approach, Palgrave Macmillan, 2013.

**MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS:**

**PAPER XVI**

**SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOMSEA604</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS: PAPER XVI</b>	<b>4</b>	<b>100</b>

**Module1: Techniques and applications of partial derivatives** (Lectures 13)

- Functions of several variables and partial derivatives
- Second order partial derivatives
- Optimisation of multivariable functions
- Constrained optimisation with Lagrange multiplier and its economic interpretation.
- Marginal productivity, Income and price elasticities of demand
- Homogeneous production functions and returns to scale
- Cobb-Douglas production function

**Module 2: Integral Calculus** (Lectures 12)

- Integration and Definite integral; area under the curve
- Economic applications
- Present value of cash flows (present value of a sum to be received in future and present value of a stream of future income)
- Consumer's and Producer's Surplus
- Learning curve

**Module 3: Correlation and Regression** (Lectures 10)

- The meaning and significance of Correlation; Scatter plot of Bivariate Distributions; Correlation and Causation

- Karl Pearson's coefficient of correlation
- Spearman's rank correlation coefficient
- Simple regression analysis- Method of Least Squares and Regression Lines
- Regression Coefficients
- Relationship between correlation coefficients and regression coefficients.

#### **Module 4: Index Numbers and Time Series**

(Lectures 10)

- Simple and composite index numbers
- Construction, uses and problems of index numbers
- Laspeyre's, Paasche's and Fisher's Index numbers
- Cost of living index numbers-real income – wholesale price index number
- Splicing of index numbers
- Components of time series
- Estimation and forecasting of trend by the Least Squares Method

#### **References:**

1. Dowling Edward T: Introduction to Mathematical Economics, Schaum's Outline Series in Economics, Tata McGraw Hill, New Delhi, 2004
2. Lerner Joel J and P. Zima: Theory and Problems of Business Mathematics, McGraw Hill, New York, 1986.
3. Dowling Edward T: Theory and Problems of Mathematical methods for Business and Economics, McGraw –Hill, 1993
4. Gupta S.P.: Statistical Methods, S. Chand, New Delhi.
5. Sancheti D. C. and V. K. Kapoor: Statistics-Theory, Methods and Applications, S. Chand, 4New Delhi

### **MATHEMATICAL METHODS IN ECONOMICS: PAPER X**

#### **Preamble:**

The objective of this paper is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory,

macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

#### SEMESTER V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOMMEB504	MATHEMATICAL METHODS IN ECONOMICS: PAPER X	4	100

#### **Module 1: Functions of one real variable**

Graphs; elementary types of functions: quadratic, polynomial, power, exponential, logarithmic; sequences and series: convergence, algebraic properties and applications; continuous functions: characterizations, properties with respect to various operations and applications; differentiable functions: characterizations, properties with respect to various operations and applications; second and higher order derivatives: properties and applications.

#### **Module 2: Single-variable optimization**

Geometric properties of functions: convex functions, their characterizations and applications; local and global optima: geometric characterizations, characterizations using calculus and applications.

#### **Module 3: Integration of functions**

Areas under curves; indefinite integrals; the definite integral.

#### **Module 4: Difference equations**

First order difference equations.

#### **References:**

1. K. Sydsaeter and P. Hammond, *Mathematics for Economic Analysis*, Pearson Educational Asia, Delhi, 2002.

## APPLIED ECONOMETRICS: PAPER XVI

### Preamble:

The aim of this course is to provide a foundation in applied econometric analysis and develop skills required for empirical research in economics. Topics include specification and selection of regression models, dynamic econometric models, advanced methods in regression analysis and panel data models. Since the emphasis is on application of methods, this course requires understanding of econometric software and computing skills.

### SEMESTER VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOAE604	APPLIED ECONOMETRICS: PAPER XVI	4	100

### Module 1: Violations of Assumptions in the Linear Regression model

Heteroscedasticity, implications, testing and remedy, autocorrelation, implications, testing and remedy, multicollinearity

### Module 2: Regression Diagnostics and Specification

Misspecification; functional forms; model selection, endogeneity and instrumental variables

### Module 3: Advanced Topics in Regression Analysis

Dynamic Econometric Models: distributed lag models; autoregressive models; simultaneous equation models.

### Module 4: Introduction to R

Running a regression in R, diagnostic tests in R, plotting graphs in R, writing a function in R

### Readings:

1. Jeffrey M. Wooldridge, Econometrics, Cengage Learning, India Edition, 2009.
2. Dimitrios Asteriou and Stephen Hall, Applied Econometrics: A Modern Approach, Palgrave Macmillan, 2007.
3. Damodar Gujarati, Econometrics by Example, Palgrave Macmillan, 2011.
4. Kleiber C and Zeilis A (2008) : Applied Econometrics with R, Springer, UseR1



## **RESEARCH METHODOLOGY: PAPER X**

### **Preamble**

The central focus of this course is an introductory study of the concepts, principles and methods of economic research. The course focuses on the logic of social science research and on practical problems of applying quantitative and qualitative methods in the process of formulating research questions. The primary goal is to strengthen student's critical thinking and reasoning skills at planning economic research and to enable them to communicate research results competently.

The study equips the students with the basic understanding of the research methodology and provides an insight into the application of modern analytical tools and techniques for the purpose of economic decision making. The course will provide students an opportunity to learn how to collect and analyze primary and secondary data. Methods covered include interview design and technique, case study method and also a study of secondary data sources. Computer Applications to research analysis and tools commonly used in research are introduced to sharpen the analytical and presentation skills of the learner.

The course is to be taught in two parts in the fifth and sixth semester of final year B.A. degree course in Economics. The entire course is to be conducted from an interdisciplinary perspective. The first part covers the structure of research and theory construction, types of research as well as the main issues of data gathering and data quality and learning of basic statistical tools. The second part provides an overview of the main methodological problems of quantitative and qualitative analysis, an introduction to hypothesis formulation, testing of hypotheses and illustrates the usage of different approaches and application of computers in recent empirical social research.

The course work of this paper will be taught in each semester. There are four units in each semester and each unit will be taught in 10 contact hours. The contact hours allotted to individual unit are notional and are adjustable to the total contact hours. In addition, a learner is expected to undertake practice on quantitative techniques and carry out computer practical exercise to grasp the nuance of fundamental statistical analysis using computers. The contact tools like discussion, group work, seminar, use of web resources and library resources are to be extensively used for teaching this paper. Hands on experience on web search, Practical sessions in the computer laboratory and Library sessions and are inbuilt requisites of this course.

The course in each Semester is categorized into three components;

- (a) Conceptual clarity on Research Methodology with 40 marks weightage
- (b) Numerical problems on Quantitative Techniques with 20 marks' weightage and

(c) Conduct of a case study, framing of schedule and questionnaire and field visit report as a project and/or Computer Application and Practical on Quantitative Techniques with 40 marks' weightage (for internal assessment.) Also an introduction to presentation tool is to be imparted with Training on Creating presentation, Customizing presentation and showing presentation as integral part of internal assessment.

#### SEMESTER V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOREMC504</b>	<b>RESEARCH METHODOLOGY: PAPER X</b>	<b>4</b>	<b>100</b>

#### **Module 1: Introduction to Concept of Research**

(10 lectures)

- Nature, Scope & Purpose of social research
- Basic assumptions of research
- Significance of social sciences research
- Objectivity in social sciences research
- Types of research: pure & applied research; formulative or exploratory research; descriptive research, historical research, experimental research, survey research
- Ethical issues relating to research
- Major Difficulties in the Area of economic research

#### **Module 2: Elements of Research Methodology**

(15 lectures)

##### I. Steps in Research process:

- Identification, selection and formulation of research problem – sources of research problem – criteria of a good research problem
- Review of literature
- Formulation of hypothesis
- Preparing Research Design: Definition, Concepts, and types– exploratory, descriptive and diagnostic, experimental and Analytical research designs
- Collecting and analysing the data
- Interpretation and report writing

II. Use of web search in research process- introduction to Internet and WWW, Using search engine like Google, Yahoo etc. Use of advanced search techniques

### **Module 3: Sources of Data for Research**

(15 lectures)

#### I. Types of data sources: Primary and Secondary, choice between primary and secondary data

- Primary data-Meaning and Collection methods
  - i. Observational method
  - ii. Interview technique
  - iii. Design of Schedule and Questionnaire
  - iv. Survey method and Field Visits
  - v. Case Study as a method
- Major Sources of Secondary data: Meaning, advantages, Relevance, limitations and cautions of secondary data.

#### II. Sampling Technique: Census and sample survey- Essentials of a good Sampling - Advantages and limitations of sampling, Methods of sampling:

- i. random sampling : simple or unrestricted random sampling- mixed or stratified random sampling, systematic or quasi random sampling – multistage or cluster random sampling - sequential random sampling
- ii. non random sampling : judgement or purposive sampling–convenience sampling accidental sampling – quota sampling

Sampling and Non-sampling errors - Sample size – selecting an appropriate sampling technique

### **Module 4: Processing and Analysis of Data**

(10 lectures)

- Classification, Tabulation and Graphical presentation of socio-economic data
- An introduction to Statistical Analytical Tools – Measures of Central Tendency – Measures of Variation: absolute and relative measures – Quartile deviation, standard deviation, coefficient of variation- Skewness: meaning and Measurement (Karl Pearson's and Bowley's methods)
- Preliminaries of Computer Applications in Data organization & Data Processing Introduction to spreadsheet application, features and functions, Using formulas and functions, Data storing, Features for Statistical data analysis, Graphical representation of data, Generating charts/ graph and other features.

## SEMESTER – VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOREMC604	RESEARCH METHODOLOGY: PAPER XVI	4	100

### **Module 1: Statistical applications in research** (15 lectures)

- Methods of studying Correlation- measurement of simple correlation: graphic method: scatter diagram - coefficient of correlation - Karl Pearson and rank correlation interpretation of  $r = \pm 1$
- Linear Regression analysis: meaning, regression lines, regression coefficients, regression equations, relationship between correlation and regression
- Analysis of Time Series – components –trend analysis- moving averages (3, 4 and 5 yearly)- method of least square

### **Module 2: Index numbers** (15 lectures)

Meaning – classification – problems encountered while constructing index numbers- uses and limitation of index numbers

Methods of constructing index numbers:

- Simple index: i) aggregate method ii) simple average of relatives method
- Weighted index: Laspeyer's, Paache's and Fisher's index – weighted average of relatives method
- Chain based index – concepts of Base shifting, splicing, and deflating
- Consumer price index: meaning, need and construction – methods: aggregate expenditure method and family budget method

### **Module 3: Hypothesis formulation and Hypothesis Testing** (10 lectures)

- Definition and functions of hypothesis –Criteria of workable hypothesis – forms and sources of hypothesis
- Concepts in Testing of Hypothesis: Universe / Population, parameter and statistic, Null and Alternative Hypotheses, Levels of Significance, critical region, Type I and type II errors - Point and Interval Estimates

### **Module 4: Research Report Writing** (10 lectures)

Types of Research Report: Technical, Popular, Interim, Summary, Article

- Format of a Research Report
- Principles of writing the Research Report: Organization and Style - Contents-Styles of reporting- Steps in drafting Reports- Editing the final draft-Evaluating the final draft - Organization of the Research Report: Preliminaries, Contents of Report, Structuring the Report: Chapter format- Pagnation- Identification- Using quotations- Presenting footnotes – abbreviations- Presentation of tables and figures- Referencing- Documentation-Use and format of appendices- Indexing - Bibliography, Appendices

**References:**

1. Gopal, M.H (1970) An Introduction to Research Procedures in Social Sciences, Bombay, Asia Publishing House.
2. Goode J.Willium & Hatt K. Paul, Methods of social Research, New York, McGraw –Hill.
3. Kothari, C.R (2004) Research Methodology: An Introduction, Delhi, New Age
4. Krishnaswami, O.R &, M.Ranganatham (2011) Methodology of Research in Social Sciences, Himalaya Publishing House, Mumbai. .(Unit 1,2, 3,4)
5. Kumar, Renjith (2009) Research Methodology: A Step by Step Guide for Research, Delhi, Pearson Education
6. P.Saravanavel ((1987) Research Methodology, Kitab Mahal, Allahabad .(Unit 1,2, 3,4)
7. Gupta S P tatistical Methods Sultan Chand and Sons, New Delhi. .(Unit 3,4,)
8. Gupta S.C, Fundamentals of Statistics, Himalaya Publication House, Bombay. (Unit 4, )9. Rajaram V. (1996), Fundamentals of computers, Prentice Hall of India, New Delhi

**ECONOMICS OF AGRICULTURE AND COOPERATION: PAPER X**

**SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOEACD504</b>	<b>ECONOMICS OF AGRICULTURE AND COOPERATION: PAPER X</b>	<b>4</b>	<b>100</b>

**Module 1: Agricultural Productivity**

(12 lectures)

Role of agriculture in economic development - Cropping Pattern Agricultural Productivity, Causes of Low Productivity in Agriculture - Measures taken to improve the Agricultural Productivity in India - Water Management and agricultural development - Agricultural labour: Problems and suggestions.

**Module 2: Agricultural Credit**

(12 lectures)

Institutional and Non-Institutional Sources of Credit - Co-operative Credit and Agriculture, Rural Indebtedness - Commercial Banks and Regional Rural Banks, micro finance - NABARD - Role and Performance.

**Module 3: Agricultural Marketing**

(12 lectures)

Types of Marketing - Corporate, Commodity and Global Problems and Measures of Agricultural Marketing - WTO and Indian Agriculture. Problems of Agricultural Marketing and its measures.

**Module 4: Agricultural Price and Policy**

(12 lectures)

New Agricultural Policy – 2007 - Food Security in India - Price Policy of CACP Evaluation, Agricultural Crisis and Farmers' Suicide. Agro-Tourism and its policy

**References:**

1. Carl Eicher and Lawrence wit ( 1964), Agriculture in Economic Development McGraw Hill Book Company, New York
2. Bilgram, S.A.R,(1966), Agricultural Economics, Himalaya Publication House, Delhi.
3. Ghatak S. and K. Ingerscent, (1964), Agriculture and Economic Development, Select Books, New Delhi
4. Raj K.N. (1988) Essays in Commercialization of Indian Agriculture, Oxford University Press, New Delhi
5. Thamarajalaxmi R. (1994), Intersectoral Relationship in Developing Economy, Academic Foundation, Delhi
6. Papola T.S. (1982), Rural Industrilization in India, Himalaya Publication House, Delhi.
7. Sadhu A.N. & Singh Amarjit (1966):” Fundamentals of Agricultural Economics, Himalaya Publication House, Delhi.

8. Soni R.N.(1955), Leading Issues in Agricultural Economics, Arihant Press, Jalandhar
9. Wanmali S. and C. Ramasamy (Ed.)( 1995), Developing Rural Infrastructure, McMillan, New Delhi
10. Govt. of India, (1976), Report of National Commission on Agriculture, New Delhi
11. Memoria C. B. (), Agricultural Problems of India
12. Lekhi R.K. (), Agricultural Problems in India
13. Datt and Sundaram (2012), Indian Economy, S.Chand & Company, New Delhi
14. Mishra & Puri, (2012), Indian Economy, Himalaya Publishing House, New Delhi
15. Vaidhanathan, A. (1995), Indian Economy: Crisis, Response and Prospects, Orient Longmans, New Delhi.
16. John W. Penson, Oral Capps, C.Parr Rosson, (1999), Introduction to Agricultural Economics, Prentice Hall, New Jersey.
17. Agrawal A.N. & Kundan K.L. Agricultural Problems of India, Vikas Publication House, New Delhi
18. Khusro A.M. (1968) Leading issues in Agricultural Development, Allied Publishers, Bombay.

**ECONOMICS OF AGRICULTURE AND COOPERATION: PAPER XVI**

**SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOEACD604</b>	<b>ECONOMICS OF AGRICULTURE AND COOPERATION: PAPER XVI</b>	<b>4</b>	<b>100</b>

**Module 1: Co-operation**

(12 lectures)

Meaning, features of Co-operation - Principles of Co-operation (Manchester-1995) – Role of Co-operation in Economic development - Globalization and Co-operation-Importance and Benefits of Co-operation.

**Module 2: Co-operative Finance in India**

(12 lectures)

Co-Operative Finance: Need, Structure, Progress and Problems - National Co-operative Development Corporation (N.C.D.C.) - Farmers service societies and urban Co-operative banks.

**Module 3: Agricultural Co-operatives**

(12 lectures)

Role and Types of Agro-Industries - Problems and Measures of Agro-Industries – Sugar and Dairy Co-operatives - Food and Fruits Processing Industry - Co-Operative Farming.

**Module 4: Co-operative Organizations in India**

(12 lectures)

Consumer Co-operatives - Co-Operative Marketing - Housing Co-operative societies - Labour Co-operative societies - Agricultural Marketing societies-Leadership in Cooperative development.

**References:**

1. R. D. Bedi ( ) Theory, History and Practice of Co-Operation, Loyal Book Depot, Meerut (U.P.)
2. Mathur B. S, ( ) Co-Operation in India, Sahitya Bhavan, Agra
3. John Matthai, ( ) Agricultural Co-Operation in India , Reliance Publishing House, New Delhi
4. Krishnaswami,( ) Fundamentals of Co-Operation, S. Chand and Company Ltd, New Delhi
5. Hajela T.N, ( ) principles, problem and practice of Co-operation, Agarwal publication.
6. Government of Maharashtra - Co-operative movement at a Glance (latest annual report).

**INTRODUCTION TO ECONOMETRICS: PAPER XI****Preamble:**

The objective of this course is to impart a basic understanding of econometrics. The student will be able to appreciate the theoretical basis of the subject. At the same time, it will enhance the student's ability to apply the theoretical techniques to the problems of the real world. Topics like forecasting have been introduced to impart this practical orientation.

**SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOITEA505</b>	<b>INTRODUCTION TO ECONOMETRICS: PAPER XI</b>	<b>4</b>	<b>100</b>



### **Module 1: Idea of a random variable**

(10 Lectures)

- Concept of a random variable: Discrete and continuous
- Expected values of a random variable
- Variance of a random variable
- Discrete random variables: Bernoulli, Binomial, Poisson
- Continuous random variables: The normal distribution

### **Module 2: Jointly distributed Random variables**

(10 Lectures)

- Joint and marginal distributions for bivariate random variables
- Conditional probability
- Conditional mean and variance
- Covariance
- Correlation and Partial correlation
- Central limit theorem (without proof)

### **Module 3: Statistical Inference**

(12 Lectures)

- Point and interval estimation
- The Z distribution
- The Null and Alternate hypotheses and significance testing for mean using Z distribution when population variance is known
- The chi-square distribution and testing for sample variance with known population variance
- The F distribution and comparing sample variances
- The t distribution and hypothesis tests when population variance is unknown.

### **Module 4: Regression Analysis**

(13 Lectures)

- Two variable regression model
- The concept of the PRF
- Classical assumptions of regression
- Derivation of the OLS estimators and their variance
- Properties of OLS estimators under classical assumptions, Gauss-Markov Theorem (without proof)

- Tests of Hypothesis, confidence intervals for OLS estimators
- Measures of goodness of fit: R square and its limitations, adjusted R square and its Limitations.

## **INTRODUCTION TO ECONOMETRICS: PAPER XVII**

### **SEMESTER VI**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOITEA605</b>	<b>INTRODUCTION TO ECONOMETRICS: PAPER XVII</b>	<b>4</b>	<b>100</b>

#### **Module 1: Econometric Model Specification**

(10 Lectures)

- Identification: Structural and reduced form
- Omitted Variables Bias
- Errors in measurement
- Endogeneity and Bias

#### **Module 2: Failure of Classical Assumptions**

(10 Lectures)

- Multi-collinearity and its implications
- Auto-correlation: Consequences and Durbin-Watson test
- Heteroskedasticity: Consequences and the Goldfeld -Quandt test

#### **Module 3: Forecasting**

(13 Lectures)

- Forecasting with a) moving averages b) linear trend c) exponential trend- CAGR
- Forecasting with linear regression
- Classical time series decomposition
- Measures of forecast performance: Mean Square Error and Root Mean Square Error
- Limitations of econometric forecasts

#### **Module 4: Linear Programming**

(12 Lectures)

- Linear programming
- Dual of a linear programming problem

- Simplex method
- Transportation

**References:**

1. Gujarati Damodar, Basic Econometrics.
2. Hatekar Neeraj (2009), Econometrics: The First Principles A Friendly Introduction.
3. Kapoor V. k. (2011), Operations Research Problems & Solutions, Sultan Chand & sons.
4. Lipschutz (Schaum Series), Theory and Problems of Statistics.

**ENVIRONMENTAL ECONOMICS: PAPER XI**

**Preamble:**

This course focusses on economic causes of environmental problems. In particular, economic principles are applied to environmental questions and their management. Economic implications of environmental policy are addressed as well as valuation of environmental improvements.

**SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOENVEB505</b>	<b>ENVIRONMENTAL ECONOMICS: PAPER XI</b>	<b>4</b>	<b>100</b>

**Module 1: Introduction to Environmental Economics**

What is environmental economics, review of microeconomics and welfare economics, Pareto optimality and market failure in the presence of externalities; property rights and Coase theorem

**Module 2: The design and implementation of Environmental Policy**

Overview-Criteria for evaluating environmental policies; Standards, Pigovian taxes and effluent fees, tradable permits, choice between taxes and quotas, implementation of environmental policy

### **Module 3: Measuring benefits of environmental improvements**

Economic value of Environment- Use and Non-use values-Measurement method:-market based and non-market based methods, contingent valuation, travel cost method, hedonic price method, risk assessment and perceptions

### **Module 4: Environmental problems**

The global environment- Trans-boundary environmental problems, economics of climate change, International environmental Agreements - , sustainable development: Concepts and measures

### **References:**

1. Barry C. Fields ( 1997) : Environmental Economics : An Introduction, McGraw Hill International Edition
2. Charles Kolstad (2000): Environmental Economics, Oxford University Press, New York.

## **DEVELOPMENT THEORY AND EXPERIENCE: PAPER XVII**

### **Preamble:**

This is the second paper of economic development sequence. 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 markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The course ends with the issues related to environment and development.

## **SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOPUEB605</b>	<b>DEVELOPMENT THEORY AND EXPERIENCE: PAPER XVII</b>	<b>4</b>	<b>100</b>

### **Module I: Demography and Development**

Demographic concepts; birth and death rates, age structure, fertility and mortality; demographic transitions during the process of development; gender bias in preferences and outcomes and evidence on unequal treatment within households; connections between income, mortality, fertility choices and human capital accumulation.

### **Module II: Structural Transformation**

The Lewis model –Clark-Fisher model of structural change , Urbanization: Trends and Projections with reference to India, Urbanization and Development, Causes of urbanization, Urban informal sector, Policies for the urban informal sector, Migration and development, Economic theory of rural-urban migration: Harris-Todaro migration model

### **Module III: Land, Labor and Credit Markets**

Role of Agriculture in Economic Development, Market Failure and Agriculture, The distribution of land ownership; Land reform and its effects on productivity; contractual relationships between tenants and landlords; Land Acquisition; Nutrition and Labor Productivity; Rural Credit Market; Microfinance; Inter-linkages between Rural Factor Markets.

### **Module IV: The Environment and Development**

The core of environmental problems-Rural poverty and environmental destruction-industrialization and environmental pollution-Economic models of environmental issues: privately owned resources, common property resources, public goods and bads: regional environmental degradation and the free rider problem, limitations of public good framework.

### **References:**

1. Debraj Ray, *Development Economics*, Oxford University Press, 2009.
2. Partha Dasgupta, *Economics: A Very Short Introduction*, Oxford University Press, 2007.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, *Understanding Poverty*, Oxford University Press, 2006.
4. Kaushik Basu, 2012, editor, *The New Oxford Companion to Economics in India*, Oxford University Press.
5. Amartya Sen, *Development as Freedom*, Oxford University Press, 2000.

6. Daron Acemoglu and James Robinson, *Economic Origins of Dictatorship and Democracy*, Cambridge University Press, 2006.
7. Robert Putnam, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, 1994.
8. Michael Todaro and Stephen Smith : *Economic Development*, 11<sup>th</sup> edition, Pearson

## **POLITICAL ECONOMY OF GLOBALISATION: PAPER XVII**

### **Preamble:**

This course explores changes in the organisation of production, labour market institutions and corporate structure. It goes on to study the consequences of globalization, especially of financial flows, for the role of the state, economic performance, gender issues, environment, human welfare and development.

### **SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOPEG605</b>	<b>POLITICAL ECONOMY OF GLOBALISATION: PAPER XVII</b>	<b>4</b>	<b>100</b>

### **Module 1: Changing Dynamics of Capitalist Production, Organisational Form and Labour Process**

Perspective on political economy with a historical overview: capitalist development in the pre-second world war period, the 'golden age' and later, Fordist and post-fordist production; changing dynamics of organisation of production, markets and labour process; the changing nature of job security and labour rights.

### **Module 2: The State in the Era of Globalisation: Welfare, Development and Autonomy**

Globalisation and the limits of the welfare state, development and state autonomy.

### **Module 3: The Changing Role of Finance**

The changing role of finance in capital accumulation and corporate structure; finance and globalisation - financialisation, financial liberalisation and financial crisis.

### **Module 4: The Social Dimensions**

Globalisation and uneven development – growth, inequality and exclusion, Gender in work, accumulation and globalisation; issues in environment and sustainability; alternatives ahead.

## **References:**

1. Michel Beaud, *A History of Capitalism, 1500-2000*, trans. by Tom Dickman and Anny Lefebvre, New York: Monthly Review Press, 2001.
2. Ash Amin (ed.), *Post-Fordism: A Reader*, Blackwell, 1994.
3. Fran Tonkiss, *Contemporary Economic Sociology: Globalisation, Production, Inequality*, Chapter 4 (Fordism and After), Routledge India 2008 reprint, 2006.
4. S. Hymer, 1975, "The Multinational Corporation and the Law of Uneven Development", in H. Radice (ed.) *International Firms and Modern Imperialism*, Penguin Books.
5. G. Gereffi, J. Humphrey and T. Sturgeon, 2005, "The Governance of Global Value Chains", *Review of International Political Economy*, Volume 12, pp. 78–104.
6. Narasimha Reddy, 2003, "Economic Globalisation, Past and Present – The Challenges to Labour" in Jomo K.S. & Khoo Khay Jin (ed.) *Globalization and Its Discontents, Revisited*, Sepsis -Tulika Books.
7. David Harvey, *A Brief History of Neoliberalism*, Oxford University Press, 2005.
8. Andrew Glyn, 2006, "Challenges to Capital", in *Capitalism Unleashed: Finance, Globalization and Welfare*, Oxford: Oxford University Press, (Ch. One, pp. 1-24).
9. G Duménil and D Levy, *The Crisis of Neoliberalism*, Harvard University Press, 2011.
10. K.S. Jomo (ed.), *The Long Twentieth Century: The Great Divergence: Hegemony, Uneven Development and Global Inequality*, Oxford University Press, 2006.
11. Gary Dymnsky, 2005, "Financial Globalization, Social Exclusion and Financial Crisis",
12. *International Review of Applied Economics*, Vol. 19, pp. 439–457.
13. E. Stockhammer, 2010, "Financialization and the Global Economy", in G. Epstein and
14. M.H. Wolfson (ed.) *The Political Economy of Financial Crises*, Oxford University Press. [Also in Working Paper Series, No. 240, Political Economy Research Institute, University of Massachusetts Amherst]
15. J.P. Smith and M.P. Ward, 1989, "Women in the Labour Market and in the Family",



16. Journal of Economic Perspectives, Volume 3, pp. 9-23.
17. Marilyn Power, 2004, "Social Provisioning as a Starting Point for Feminist Economics",
18. Feminist Economics, Volume 10, pp. 3-19.
19. John Bellamy Foster, Ecology against Capitalism, Monthly Review Press, 2002.

**PROJECT: PAPER XII**

**SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOPROA506</b>	<b>PROJECT: PAPER XII</b>	<b>3</b>	<b>100</b>

**PROJECT: PAPER XVIII**

**SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOPROA606</b>	<b>PROJECT: PAPER XVIII</b>	<b>3</b>	<b>100</b>

Revised

As per letter No. AA/ICD/2018-19/542-

**UNIVERSITY OF MUMBAI**

No. UG/58 of 2018-19

dt. 10/10/2018

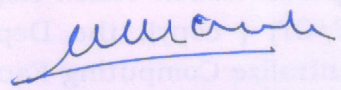
**CIRCULAR:-**

Attention of the Principals of the Affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty is invited to this office circular No. UG/270 of 2017-18, dated 26<sup>th</sup> October, 2017 relating to syllabus of Bachelor of Arts.

They are hereby informed that the recommendations made by the Board of Studies in Economics at its meeting held on 18<sup>th</sup> May, 2018 have been accepted by the Academic Council at its meeting held on 14<sup>th</sup> June, 2018 vide item No. 4.3 and that in accordance therewith, the revised syllabus as per the (CBCS) for the T.Y.B.A. in Economics – Sem V & VI has been brought into force with effect from the academic year 2018-19, accordingly. (The same is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032

To 6<sup>th</sup> June, 2018  
July

  
(Dr. Dinesh Kamble)  
I/c REGISTRAR

The Principals of the affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty. (Circular No. UG/334 of 2017-18 dated 9<sup>th</sup> January, 2018.)

**A.C./4.3/14/06/2018**

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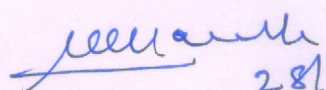
No. UG/58 -A of 2018

MUMBAI-400 032

6<sup>th</sup> June, 2018  
July

Copy forwarded with Compliments for information to:-

- 1) The I/c Dean, Faculty of Humanities,
- 2) The Chairman, Board of Studies in Economics,
- 3) The Director, Board of Examinations and Evaluation,
- 4) The Director, Board of Students Development,
- 5) The Professor-cum-Director, Institute of Distance and Open Learning (IDOL),
- 6) The Co-Ordinator, University Computerization Centre,

  
28/6/18  
(Dr. Dinesh Kamble)  
I/c REGISTRAR

AC 14-6-18

Item No. 4.3

# University of Mumbai

University of Mumbai



## Revised Syllabus Sem. V & Sem. VI Program: B. A. Course: Economics

(As per the Credit Based Semester and Grading System with effect from the academic year 2018-2019)

## **PREAMBLE:**

The syllabus of TYBA has been revised by keeping in view of the recent trends in the subject of economics. The Board of Studies in Economics has revised the syllabi of papers at the TYBA which will be made effective **from the Academic Year 2018-19**. In this revision, some of the existing optional papers have been replaced by new papers. A broad overview of the structure, followed by the syllabi of individual papers, is given below.

## **DURATION:**

- The course shall be a full time course.
- The duration of B.A. course shall be of Three years /Six Semesters.

FYBA: SEMESTER – I & II (One paper each semester)

SYBA: SEMESTER – III & IV (Two papers each semester)

TYBA: SEMESTER – V & VI (Six papers each semester)

## **PATTERN:**

The T.Y.B. A. [Entire Economics] Course shall have 12 papers. Every semester shall have six papers, each carrying 100 marks. However students can opt combination of any two subjects (Economics and any other subject) in which every semester shall have three papers of each subject, carrying 100 marks. Moreover, Papers IX and Papers XII of Semester V and Paper XV and XVIII Semester VI are bifurcated into 80 marks of written exam and 20 marks of project. It is hereby stipulated to have a maximum page limit of 20 for the project.

## **SCHEME OF EXAMINATION:**

The duration of the examination, paper pattern and the allotment of lectures as well as marks are given in detail as follows:

### **Duration:**

- **Three Hours** for each 100 marks paper and Two and Half an Hour for 80 marks paper.

### **Allotment of Lectures:**

- The allotment of lectures is as per the common guidelines stipulated by the Academic Council for Humanities of University of Mumbai.

### **Paper Pattern:**

- There shall be five questions each of 20 marks, for 100 marks paper divided into three sub questions (a, b, c,) with an internal option to choose any two.
- There shall be four questions of 20 marks for 80 marks paper with internal options mentioned as the same above.
- All questions shall be compulsory with internal choice within the questions.
- Questions may be subdivided into sub-questions a, b, c as mentioned earlier and the allocation of marks shall depend on the weightage given to the topic.

<b>Questions</b>	<b>Modules</b>	<b>Marks</b>
Qn.1	Unit I	20
Qn.2	Unit II	20

Qn.3	Unit III	20
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Qn.4	Unit IV	20
Qn.5	4 Sub-questions from Unit I, II, III & IV	20

### **COURSE STRUCTURE**

(APPLICABLE FROM ACADEMIC YEAR 2018 2019)

#### **TYBA (SEMESTER –V)**

<b>COURSE CODE</b>	<b>REVISED PAPER</b>		<b>CREDIT</b>	<b>MARKS</b>
<b>GROUP-I : CORE PAPERS</b>				
<b>ECOMIE501</b>	<b>VII</b>	<b>MICROECONOMICS- III</b>	<b>4</b>	<b>100</b>
<b>ECODEV502</b>	<b>VIII</b>	<b>ECONOMICS OF DEVELOPMENT</b>	<b>4</b>	<b>100</b>
<b>GROUP-II :ELECTIVE PAPERS</b>				
<b>ECOFEA503</b>	<b>IX</b>	<b>FINANCIAL ECONOMICS</b>	<b>3</b>	<b>80</b>
<b>OR</b>				
<b>ECOEACB503</b>	<b>IX</b>	<b>ECONOMICS OF AGRICULTURE AND COOPERATION</b>	<b>3</b>	<b>80</b>
<b>OR</b>				
<b>ECOILEC503</b>	<b>IX</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS</b>	<b>3</b>	<b>80</b>
<b>OR</b>				
<b>ECOMSEAA504</b>	<b>X</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECORMB504</b>	<b>X</b>	<b>RESEARCH METHODOLOGY</b>	<b>4</b>	<b>100</b>

<b>OR</b>				
<b>ECOEHIC504</b>	<b>X</b>	<b>ECONOMIC HISTORY OF INDIA</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOIEA505</b>	<b>XI</b>	<b>INTRODUCTION TO ECONOMETRICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOMMEB505</b>	<b>XI</b>	<b>MATHEMATICAL METHODS IN ECONOMICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOENVC505</b>	<b>XI</b>	<b>ENVIRONMENTAL ECONOMICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOHET506</b>	<b>XII</b>	<b>HISTORY OF ECONOMIC THOUGHT</b>	<b>3</b>	<b>80</b>

## MICROECONOMICS III: PAPER VII

### SEMESTER –V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - I	CORE PAPERS		
ECOMIC501	MICROECONOMICS III : PAPER VII	4	100

#### Preamble:

*The course is designed to provide sound understanding in microeconomic 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.*

#### **Module 1: Monopoly**

Sources of monopoly - Profit maximising monopoly – Calculation of price, output and profit for a monopoly- Price discrimination: First, Second and Third degree- Public policy towards monopoly.

#### **Module 2: Basics of Game theory**

Prisoner’s Dilemma – Dominant strategy equilibrium – Battle of sexes game – Nash equilibrium – Extensive form games – Game tree.

#### **Module 3: Oligopoly**

The Cournot model – The Bertrand model – The Edgeworth model – The Chamberlin model – The Kinked demand curve model – Collusion and Cartels – Price Leadership.

#### **Module 4: General Equilibrium and Welfare Economics**

Interdependence in the Economy – General Equilibrium and its Existence -The Pareto Optimality Condition of Social Welfare, Marginal Conditions for Pareto Optimal Resource Allocation.

Perfect Competition and Pareto Optimality – Kaldor- Hicks Compensation Criterion - Arrow’s Impossibility Theorem.

#### **References:**

1. Koutsoyannis, Modern Microeconomics, Macmillan Press Ltd., London, 1975.
2. Mankiw, N. Gregory, Principles of Microeconomics, Cengage Learning, 2015.
3. Mansfield, Edwin, Micro-economics: Theory & Applications, 5<sup>th</sup> edition, W.W. Norton & Company, New York, 1985.
4. Sen Anindya, Microeconomics: Theory and Applications, Second edition Oxford University Press, New Delhi, 2007.
5. Salvatore, D. Microeconomics : Theory and Applications , New Delhi Oxford, New Delhi, Oxford University Press 2006.
6. R.Gibbons , A Primer in Game Theory, Harvester Wheatsheaf, 1992.



## **ECONOMICS OF DEVELOPMENT: PAPER VIII**

### **SEMESTER –V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP -I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECODEV502</b>	<b>ECONOMICS OF DEVELOPMENT :PAPER VIII</b>	<b>4</b>	<b>100</b>

#### **Preamble:**

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

#### **Module1:Concepts of Economic Growth and Development:**

Meaning of Growth and Development – Distinction between growth & development– Concept of human development. HDI, GDI, Sustainable development – Green GDP – Three core values of development – Capability Approach.

#### **Module 2:Structural Issues in Development Process:**

Big push theory – Theory of human capital – Role of Education, Health & nutrition in economic development- Schumpeter’s theory of development, Dual economy models of growth, Solow’s growth model.

#### **Module 3:Inequality, Poverty and Development:**

Measures of poverty and inequality – Kuznet’s inverted U-hypothesis – Policy options for poverty alleviation – Inclusive growth – Self Help Groups and Micro Finance.

#### **Module 4:Technology and Economic Development:**

Role of Infrastructure in economic development –Role of technology in economic development, Types of technical progress –Schumacher’s Concept of Intermediate/ Appropriate technology, Green technology.

#### **References:**

1. Todaro, Michael P. and Stephen C. Smith. Economic Development, 8e. Delhi: Pearson Education, 2003.
2. Thirlwall, A.P. Growth and Development 8e. New York: Palgrave MacMillan, 2005.
3. Meier, Gerald M. and James E. Rauch. Leading Issues in Economic Development, 8e. New Delhi: Oxford Univ. Press, 2006.
4. Mamoria, Joshi, Principles and practice of marketing in India, Kitab Mahal, 1979.
5. Boldwin, Economic Development: Theory, History and Policy, Willy Publishers, 1957
6. Sinha Francis, Microfinance self Help Groups in India: Living up to Their Promises, Practical Action Publishing, England, 2009.

# **FINANCIAL ECONOMICS: PAPER IX**

## **SEMESTER – V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOFEA503</b>	<b>FINANCIAL ECONOMICS: PAPER IX</b>	<b>3</b>	<b>80</b>

### **Preamble:**

*The course introduces students to the economics of Finance. It aims at imparting knowledge about the basic models of investment and portfolio analysis, including the CAPM. The valuation of assets, derivatives and options is to be studied in addition to patterns of corporate financing.*

### **Module 1: Investment & portfolio Analysis:**

Basic theory of interest, discounting & present value; internal rate of return, evaluation criteria, fixed income securities; bonds prices & yields. Structure of interest rate, yield curves, spot & forward rates. Portfolio of assets, random asset returns, Mean variance portfolio analysis, The Markowitz Model & two fund theorem.

### **Module 2: CAPM:**

The capital Market line, the CAP Model, the beta of an asset & of a portfolio, security market line, CAPM model in investment & pricing formula.

### **Module 3: Options & Derivatives:**

Meaning, functions & types of derivatives - forward contracts, futures - forward & future prices, stock index futures, interest rate futures, future for hedging. Options & Swaps and their types - Option market: call & put options, option trading strategies - spreads, straddles, strips & straps, strangles, the principle of arbitrage. Participants of derivatives market- hedgers, speculators, arbitrageurs.

### **Module 4: Corporate Finance:**

Patterns of corporate financing: stock, debt, preferences, convertibles. Capital structure & the cost of capital, corporate debt & dividend policy, the Modigliani –Miller theorem.

### **References:**

1. David Luenberger , Investment Science, Oxford University Press, 1997.
2. Hull John C, Options, Futures and other derivatives, Pearson Education, 2005.
3. Thomas Copeland, J. Fred Weston and Kuldeep Shastri, Financial Theory and Corporate Policy, Prentice Hall, 2003.
4. Richard Brealey and Stewart Myers, Principles of Corporate Finance, McGraw Hill, 2002.
5. Stephen Ross and Bradford Jordan, Fundamentals of Corporate Finance, McGraw Hill, 2005.
6. William Sharpe, Gordon Alexander and J. Bailey, Investment, Prentice Hall of India, 2003.

# ECONOMICS OF AGRICULTURE AND COOPERATION : PAPER IX

## SEMESTER V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOECB503	ECONOMICS OF AGRICULTURE AND COOPERATION : PAPER IX	3	80

### Preamble:

*This paper provides an overview of the role of agriculture in the economic development of the country and the salient features associated to agricultural productivity and agricultural labour. The pertinent aspects related to agricultural credit, agricultural marketing as well as the global problems existing in the marketing are dealt in. Students can acquire understanding about the features of agricultural policy and the agrarian crisis as well as the problems and challenges in the field of agriculture and cooperation.*

### **Module 1: Agricultural Productivity:**

Role of agriculture in economic development - Cropping Pattern Agricultural Productivity, Causes of Low Productivity in Agriculture - Measures taken to improve the Agricultural Productivity in India - Water Management and agricultural development - Agricultural labour: Problems and suggestions.

### **Module 2: Agricultural Credit:**

Institutional and Non-Institutional Sources of Credit - Co-operative Credit and Agriculture, Rural Indebtedness - Commercial Banks and Regional Rural Banks, microfinance - NABARD - Role and Performance.

### **Module 3: Agricultural Marketing :**

Types of Marketing - Corporate, Commodity and Global Problems and Measures of Agricultural Marketing - WTO and Indian Agriculture. Problems of Agricultural Marketing and its measures- National Agricultural Market.

### **Module 4: Agricultural Price and Policy:**

New Agricultural Policy – 2007 - Food Security in India - Price Policy of CACP  
Evaluation, Agricultural Crisis and Farmers’ Suicide. Agro-Tourism and its policy

### **References:**

1. Bilgram, S.A.R, Agricultural Economics, Himalaya Publication House, Delhi, 1966
2. Raj K.N, Essays in Commercialization of Indian Agriculture, Oxford University Press, New Delhi, 1988.
3. Thamarajalaxmi R, Intersectoral Relationship in Developing Economy, Academic Foundation, Delhi, 1994.
4. Memoria C. B, Agricultural Problems of India, Kitab Mahal Allahabad, 1979.

5. Datt and Sundaram, Indian Economy, S.Chand & Company, New Delhi,2012.
6. Mishra &Puri, Indian Economy, Himalaya Publishing House, New Delhi,2012.

## **INDUSTRIAL AND LABOUR ECONOMICS: PAPER IX**

### **SEMESTER V**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
<b>ECOILEC503</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS : PAPER IX</b>	<b>3</b>	<b>80</b>

#### **Preamble:**

*There has been a paradigm shift in the structure of the Indian industrial sector and the policies governing it ever since the new era of globalisation and liberalisation has ushered in. This paper intends to equip the students with the knowledge about the fundamentals of Industrial Economics and also the changing policies related to the Indian industry in the globalised era.*

#### **Module 1: Introduction**

Meaning and Scope of Industrial Economics, Industrial Profile : Private sector - Performance and Problems; Cooperatives - features, types, merits and demerits; Public Sector - Role, Performance and Problems, Diversification and Industrial Combinations - Motives for Mergers and Acquisitions.

#### **Module 2: Industrial Location and Problem of Regional Imbalance**

Determinants of Industrial Location, Theories of Industrial Location - Weber's and Sargent Florence's Theories, Dispersion of Industries and the Problem of Regional Imbalance

#### **Module 3: Industrial Productivity and Industrial Sickness**

Concept and Measurement of Industrial Productivity, Factors Affecting Industrial Productivity, Industrial Sickness - Causes, Effects and Remedial Measures, Rationalisation - Concept, Aspects and Impact

#### **Module 4: Industrial Development in India**

New Industrial Policy, 1991; Disinvestment Policy; FIPB Revamp- Micro, Small and Medium Enterprises Development Act, 2006; National Manufacturing Policy, 2011,Recent Trends in India's Industrial Growth, Industrial Policy, 2012, Role of MNCs in the Indian Economy - Merits and Demerits, Issues in Industrial Proliferation and Environment Preservation; Pollution Control Policies.

#### **References:**

1. Agrawal A.N, Indian Economy, New Age International Publishers, New Delhi, 2011.
2. Barthwal R.R, Industrial Economics, New Age International Publishers, New Delhi, 2007.
3. Cherunilam. F, Industrial Economics: Indian Perspective, Himalaya Publishing House, Mumbai, 1994.
4. Datt R. and Sundaram K.P.M, Indian Economy, S.Chand& Co., New Delhi, 2009.
5. Desai S.S.M. and Bhalerao N, Industrial Economy of India, Himalaya Publishing House, Mumbai, 2008.
6. Kuchhal S.C, Industrial Economy of India, Chaitanya Publishing House, Allahabad, 1980.

## **MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS: PAPER X**

### **SEMESTER V**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
<b>ECOMSEAA504</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS :PAPER X</b>	<b>4</b>	<b>100</b>

#### **Preamble**

*A plethora of data has emerged at an exponential rate and it is the description, interpretation and understanding of these data and drawing of accurate conclusions that is imperative for a student of Economics. The aim of this paper is to provide students with the mathematical and statistical skills and understanding needed for 'knowing why' and 'when' to apply these techniques.*

#### **Module 1: Equations, Graphs and Derivatives**

Microeconomic applications of equations and graphs - Linear and non-linear relationships in economic analysis– Market demand and supply models, taxes, elasticity  
Derivatives and their applications in various areas of economic analysis – Derivatives–  
Higher order derivatives– Increasing and decreasing functions; Necessary and sufficient conditions for maxima and minima– Optimisation of economic functions

#### **Module 2: Linear Algebra**

Matrices and basic operations on matrices– Rank of a matrix– Inverse of a matrix–  
Cramer's rule– Input-Output Analysis and policy implications– Linear Programming  
Problem: Formulation and graphical solution.

#### **Module 3: Descriptive Statistics and graphing techniques for presenting data**

Concept of primary and secondary data along with tabulation and graphs – Measures of central tendency (only arithmetic-mean, median, and mode) – Absolute and relative

measures of dispersion (range, quartile deviation, mean deviation and standard deviation)  
with simple applications – Measures of skewness and kurtosis – Lorenz Curve.  
Commercial Statistics – Brokerage, Commission and Insurance.

#### **Module 4: Elementary Probability Theory**

Sample space and events– Mutually exclusive, exhaustive and complimentary events– Conditional probability– Binomial probability distribution– Nature and Properties of the Normal Probability Distribution; Standard Scores and the Normal Curve; The Standard Normal Curve: Finding Areas when the Score is Known, Finding Scores when the Area is Known.

#### **References:**

1. Dowling Edward T: Introduction to Mathematical Economics, Schaum Outline Series in Economics, Tata McGraw -Hill, New Delhi, 2004.
2. Dowling Edward T: Theory and Problems of Mathematical Methods for Business and Economics, McGraw –Hill, 1993.
3. Gupta S.P.: Statistical Methods, S. Chand, New Delhi, 2014.
4. Lerner Joel J and P.Zima: Theory and Problems of Business Mathematics, McGraw Hill, New York, 1986.
5. Sancheti D.C. and V.K. Kapoor: Statistics-Theory, Methods and Applications, S. Chand, New Delhi, 2014.
6. Chiang A. C.: Fundamental Methods of Mathematical Economics, 3rd edition, McGraw-Hill, 1984.

### **RESEARCH METHODOLOGY: PAPER X**

#### **SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECORMB504</b>	<b>RESEARCH METHODOLOGY : PAPER X</b>	<b>4</b>	<b>100</b>

#### **Preamble:**

*This paper is designed with the view to introduce the concepts, principles and methods of economic research based on qualitative and quantitative data. The course will enable the students to get an insight into the applications of modern analytical tools and techniques related economic decision making. The student gets an opportunity to learn how to collect and analyze primary and secondary data. Practical sessions will strengthen the knowledge related to computer applications to research analysis.*

#### **Module 1: Introduction to Concept of Research:**

Nature, Scope & Purpose of social research - Basic assumptions of research - Significance and objectivity in social sciences research - Types of research: pure & applied research; formulative or exploratory research; descriptive research, historical research, experimental research, survey research - Ethical issues and major difficulties relating to research .

## **Module 2: Elements of Research Methodology:**

Steps in Research process: Identification, selection and formulation of research problem – sources of research problem – criteria of a good research problem - Review of literature - Formulation of hypothesis - Preparing Research Design: Definition, Concepts, and types– exploratory, descriptive and diagnostic, experimental and Analytical research designs – Collection and analysis of the data - Interpretation and report writing.

Use of web search in research process- introduction to Internet and WWW - Using search engine like Google, Yahoo etc. Use of advanced search techniques.

## **Module 3: Sources of Data for Research:**

Types of data sources: Primary and Secondary - Primary data-Meaning and Collection methods - Observational method - Interview technique - Design of Schedule and Questionnaire - Survey method and Field Visits - Case Study as a method.

Major Sources of Secondary data: Meaning, advantages, Relevance, limitations and cautions of secondary data.

Sampling Technique: Census and sample survey- Essentials of a good Sampling - Advantages and limitations of sampling, Methods of sampling: Random sampling : Simple or Unrestricted Random Sampling- Mixed or Stratified Random Sampling, Systematic or Quasi Random sampling – Multistage or Cluster Random Sampling - Sequential Random Sampling, Non random sampling : Judgement or Purposive sampling–Convenience sampling accidental sampling – Quota sampling, Selecting an appropriate sampling technique- Sampling and Non-sampling errors - Sample size.

## **Module 4: Processing and Analysis of Data**

Classification, Tabulation and Graphical presentation of socio-economic data - An introduction to Statistical Analytical Tools – Measures of Central Tendency – Measures of Variation: absolute and relative measures – Quartile deviation, standard deviation, coefficient of variation- Skewness: meaning and Measurement (Karl Pearson’s and Bowley’s methods) - Basics of Computer Applications in Data organization & Data Processing, Introduction to spreadsheet application, features and functions, Using formulas and functions, Data storing, Features for Statistical data analysis, Graphical representation of data, Generating charts/ graph and other features.

### **References:**

1. Goode J. William & Hatt K. Paul, Methods in social Research, New York, McGraw-Hill, 1952.
2. Kothari, C.R., Research Methodology: An Introduction, Delhi, New Age, 2004.
3. Krishnaswami, O.R & M. Ranganatham ,Methodology of Research in Social Sciences, Himalaya Publishing House, Mumbai, 2011.
4. P. Saravanavel, Research Methodology, KitabMahal, Allahabad, 1987.
5. Gupta S. P., Statistical Methods, Sultan Chand and Sons, New Delhi, 2014 .
6. Rajaram V., Fundamentals of computers, Prentice Hall of India, New Delhi, 1996.



# ECONOMIC HISTORY OF INDIA: 1857-1947: PAPER X

## SEMESTER – V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOEHIC504	ECONOMIC HISTORY OF INDIA: 1857-1947 : PAPER X	4	100

### **Preamble:**

*This course analyses key aspects of Indian economic development 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.*

### **Module 1: Growth and Structural Change 1857-1947**

The state of Indian Economy after 1857 under British Rule- Nature of Communities- Trade and Tariff Policy- Foreign Investment and Exchange Rate Policy, Saving and Investment- Public Finance -Balance of Payments- Great Depression and the Indian Economy.

### **Module 2: Agriculture and the Commons**

Trends in Production and Income-Resources, Regional dimensions of agriculture- land, labour and credit markets- forests and forest-indigenous inhabitants -village commons and pastures-land use patterns-Jhum Cultivation- Waste lands.

### **Module 3: Industry**

Long term patterns of small scale industrialization and its interpretation- handloom, weaving and other industries- labour and capital in traditional small scale industry- modern small scale industry- statistical outline of large scale industry- stages of industrialization and major industries- labour, finance, entrepreneurship and management in large scale industry.

### **Module 4: Infrastructure, Fiscal and Monetary systems:**

Impetus- Irrigation- Railways- Roads and Inland Waterways- Ports- Post and Telegraph- Power- Legal- systems Economic policy and policy making-Trade policy- Fiscal systems- Monetary system- prices.

### **References:**

1. Tirthankar Roy, The Economic History of India 1857-1947, Oxford University Press, 2011.
2. S.Sivasubramonian, National Income of India in the Twentieth Century, Oxford University Press, 2000.
3. SumitGuha (ed.), Growth, Stagnation or Decline?, Delhi , Oxford University Press,1993.

4. A.K. Banerji, India's Balance of Payments, Bombay: Asia Publishing House, 1962.
5. George Blyn, Agricultural Trends in India, 1891-1947: Output, Availability and Productivity, Philadelphia: University of Pennsylvania press, 1966
6. Alice Thorner, The Secular Trend in the Indian Economy, 1881-1951, Economic Weekly, vol.14, 1962.

## INTRODUCTION TO ECONOMETRICS: PAPER XI

### SEMESTER V

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOIEA505	INTRODUCTION TO ECONOMETRICS : PAPER XI	4	100

#### **Preamble:**

*The objective of this course is to impart a basic understanding of econometrics. At the same time, it will enhance the student's ability to apply the theoretical techniques to the problems of the real world. Topics like forecasting have been introduced to impart this practical orientation.*

#### **Module 1: Idea of a random variable:**

Concept of a random variable: Discrete and continuous - Expected values of a random variable - Variance of a random variable - Discrete random variables: Bernoulli, Binomial, Poisson - Continuous random variables: The normal distribution.

#### **Module 2: Jointly distributed Random variables:**

Joint and marginal distributions for bivariate random variables - Conditional probability- Conditional mean and variance – Covariance - Correlation and Partial correlation - Central limit theorem (without proof).

#### **Module 3: Statistical Inference:**

Point and interval estimation - The Z distribution - The Null and Alternate hypotheses and significance testing for mean using Z distribution when population variance is known - The chi-square distribution and testing for sample variance with known population variance - The F distribution and comparing sample variances - The t distribution and hypothesis tests when population variance is unknown.

#### **Module 4: Regression Analysis:**

Two variable regression model - The concept of the PRF - Classical assumptions of regression - Derivation of the OLS estimators and their variance - Properties of OLS estimators under classical assumptions, Gauss-Markov Theorem (without proof) - Tests

of Hypothesis, confidence intervals for OLS estimators - Measures of goodness of fit: R square and its limitations, adjusted R square and its Limitations.

**References:**

1. Damodar N. Gujarati, Basic Econometrics, McGraw-Hill, Delhi, 2003.
2. Kapoor V. K., Operations Research Problems & Solutions, Sultan Chand & sons, Delhi, 2011.
3. Murray R. Spiegel Schaum's Outline of Theory and Problems of Statistics, McGraw- Hill, 1988.
4. Jeffrey M. Wooldridge, Econometrics, Cengage Learning, India Edition, 2009.
5. Damodar Gujarati, Econometrics by Example, Palgrave Macmillan, 2011.
6. Stock J. Watson, Introduction to Econometrics, Prentice Hall, New York, 2003.

**MATHEMATICAL METHODS IN ECONOMICS: PAPER XI**

**SEMESTER V**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
<b>ECOMMEB505</b>	<b>MATHEMATICAL METHODS IN ECONOMICS : PAPER XI</b>	<b>4</b>	<b>100</b>

**Preamble:**

*The objective of this paper is to prepare the students the basic mathematics that enables the study of economic theory based on microeconomic theory, macroeconomic theory, statistics and econometrics. In this course, particular economic models are not dealt as the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general.*

**Module 1: Functions of one real variable**

Graphs; elementary types of functions: quadratic, polynomial, power, exponential, logarithmic; sequences and series: convergence, algebraic properties and applications; continuous functions: characterizations, properties with respect to various operations and applications; differentiable functions: characterizations, properties with respect to various operations and applications; second and higher order derivatives: properties and applications.

**Module 2: Single-variable optimization**

Geometric properties of functions: convex functions, their characterizations and applications; local and global optima: geometric characterizations, characterizations using calculus and applications.

**Module 3: Integration of functions and Differential Equations**

Areas under curves; indefinite integrals; the definite integral, First Order Differential Equations.

**Module 4: Mathematical Methods and Models**

Game Theory, Input Output Model, Linear Programming, Auto Correlation, Multicollinearity , Hetroscadasticity.

**References:**

1. K. Sydsaeter and P. Hammond, Mathematics for Economic Analysis, Pearson Educational Asia, Delhi, 2002.
2. Damodar N. Gujrati, Basic Econometrics, McGraw-Hill, Delhi, 2003.
3. Chinag A. C.: Fundamental Methods of Mathematical Economics, McGraw-Hill, Delhi,1984.
4. R. G. D. Allan, Mathematical Analysis for Economists, Macmillan and Co., 1962.
5. Dowling Edward T: Introduction to Mathematical Economics, Schaum Outline Series in Economics, Tata McGraw -Hill, New Delhi, 2004.
6. Dowling Edward T: Theory and Problems of Mathematical Methods for Business and Economics, McGraw –Hill, 1993.

**ENVIRONMENTAL ECONOMICS: PAPER XI**

**SEMESTER V**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOENVC505</b>	<b>ENVIRONMENTAL ECONOMICS: PAPER XI</b>	<b>4</b>	<b>100</b>

**Preamble:**

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

**Module1: Introduction to Environmental Economics:**

Introduction to environmental development and environmental economics, Rio-Declaration on environmental development, Agenda 21 programme of action for sustainable development, Social and economic dimensions, Conservation and management of resources for development.

**Module 2: The design and implementation of Environmental Policy:**

Overview - Criteria for evaluating environmental policies; Standards, Pigovian taxes and effluent fees, tradable permits, choice between taxes and quotas, implementation of environmental policy.

**Module 3: Measuring benefits of environmental improvements:**

Economic value of Environment- Use and Non-use values-Measurement method:-market based and non-market based methods, contingent valuation, travel cost method, hedonic price method, risk assessment and perceptions.

#### **Module 4: Environmental problems:**

The global environment- Trans-boundary environmental problems, economics of climate change, International environmental Agreements - , sustainable development: Concepts and measures.

#### **References:**

1. Barry C. Fields: Environmental Economics : An Introduction, McGraw Hill International Edition, 1997.
2. Charles Kolstad : Environmental Economics, Oxford University Press, New York, 2000.
3. Kaltschmitt, Martin, Streicher, Wolfgang, Wiese, Andreas, Renewable Energy: Technology, Economics and Environment, Springer, Germany, 2007.
4. Hanley Nick, Shogren Jason and White Ben: Introduction to Environmental Economics, Oxford University Press, 2001.
5. Smith Stephen: Environmental Economics: A very Short Introduction, 1st Edition, Oxford University Press, New York, 2011.
6. United Nations Sustainable Development, UN Conference on Environment & Development, Rio de Janeiro, Brazil, Agenda 21, <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>, 1992.

### **HISTORY OF ECONOMIC THOUGHT: PAPER XII SEMESTER V**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOHET506</b>	<b>HISTORY OF ECONOMIC THOUGHT: PAPER XII</b>	<b>3</b>	<b>80</b>

#### **Preamble:**

*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.*

#### **Module 1: Classical Period**

Adam Smith - division of labour, theory of values, capital accumulation, distribution, David Ricardo- Value, theory of rent, distribution. Karl Marx - dynamics of social changes, theory of values, surplus value, profit and crisis of capitalism and Contemporary Relevance.

#### **Module 2: Marginalist : Marshall To Schumpeter**

Role of time in price determination , economics methods, ideas of consumer's surplus, representative firm, external and internal economies, quasi-rent, nature of profit; Pigou : welfare economics: Schumpeter: role of entrepreneur and innovation.

#### **Module 3: Keynesian Ideas:**

Liquidity Preference Theory and Liquidity trap, Consumption Function, MPC,

Multiplier & Accelerator principles and their interaction, wage rigidities, underemployment equilibrium, role of fiscal policy: deficit spending and public works, multiplier principles, cyclical behaviour of the economy.

**Module 4: Post- Keynesian Developments:**

Hayek – Supply side economics: Arthur Laffer, Evans – Monetarism: Milton Friedman’s Don Patinkin – An overview of the new classical economics: Robert Lucas.

Nobel Prize Winners in Economics: A. K. Sen (1998), Joseph Stiglitz (2001), Paul Krugman (2008), Jean Tirole (2014), Angus Deaton (2015), Richard Thaler (2017).

**Reference:**

1. Gide, O. and G. Rist , A History of Economic Doctrine, George Harrop Co., London, 1956.
2. Roll, E, A History of Economic Thought, Faber Landon, 1973.
3. Dasgupta A. K, Epochs of Economic Theory Oxford University Press. New Delhi, 1985.
4. Schumpeter, J.A, Ten Great Economist, Oxford University Press, New York, 1951.
5. Ghosh and Ghosh: Concise History of Economic Thought, Himalaya Publishers.
6. Puttaswamaiah K, Nobel Economists – Lives and Contributions, Indus Public Co., New Delhi, 1995.

**TYBA (SEMESTER –VI)**

<b>COURSE CODE</b>	<b>REVISED PAPER</b>		<b>CREDIT</b>	<b>MARKS</b>
<b>GROUP-I : COMPULSORY PAPERS</b>				
<b>ECOMA601</b>	<b>XIII</b>	<b>MACRO ECONOMICS- III</b>	<b>4</b>	<b>100</b>
<b>ECOINT602</b>	<b>XIV</b>	<b>INTERNATIONAL ECONOMICS</b>	<b>4</b>	<b>100</b>
<b>GROUP-II : ELECTIVE PAPERS</b>				
<b>ECOIFSA603</b>	<b>XV</b>	<b>INDIAN FINANCIAL SYSTEM</b>	<b>3</b>	<b>80</b>
<b>OR</b>				
<b>ECOEACB603</b>	<b>XV</b>	<b>ECONOMICS OF AGRICULTURE &amp; COOPERATION</b>	<b>3</b>	<b>80</b>
<b>OR</b>				
<b>ECOILEC603</b>	<b>XV</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS</b>	<b>3</b>	<b>80</b>

<b>ECOMSEA604</b>	<b>XVI</b>	<b>MATHEMATICAL &amp; STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECORMB604</b>	<b>XVI</b>	<b>RESEARCH METHODOLOY</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOIETC604</b>	<b>XVI</b>	<b>INDIAN ECONOMIC THOUGHT</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOTPEA605</b>	<b>XVII</b>	<b>THEORY AND PRACTICE OF ECONOMETRICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				
<b>ECOAEB605</b>	<b>XVII</b>	<b>APPLIED ECONOMETRICS</b>	<b>4</b>	<b>100</b>
<b>OR</b>				



<b>ECODTEC605</b>	<b>XVII</b>	<b>DEVELOPMENT THEORY AND EXPERIENCE</b>	<b>4</b>	<b>100</b>
<b>ECOITPP606</b>	<b>XVIII</b>	<b>INTERNATIONAL TRADE, POLICY AND PRACTICE</b>	<b>3</b>	<b>80</b>

### **MACROECONOMICS III: PAPER XIII**

#### **SEMESTER –VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP -I</b>	<b>COMPULSORY PAPERS</b>		
<b>ECOMA601</b>	<b>MACROECONOMICS III: PAPER XIII</b>	<b>4</b>	<b>100</b>

**Preamble:**

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

**Module 1: The Goods Market in the Open Economy:**

Trade Balance and its implications for GDP calculations – Export and Import Functions  
 – The Real Exchange Rate and why it matters –Why equilibrium GDP is consistent with a trade imbalance? – Fiscal and Exchange Rate Policy with a Fixed Exchange Rate.

**Module 2: Money/Financial Markets and Mundell-Fleming Model:**

The LM equation for the open economy –Uncovered Interest Parity and its implications for exchange rate determination – The combined IS/LM/UIP model.

Fiscal and Monetary Policy under Fixed and Flexible Exchange Rates– The Mundell-Fleming trilemma.

**Module 3: Exchange Rate Regimes & Exchange Rate Crises:**

The choice of regime – Fixed or Flexible – The spectrum of arrangements from Hard Peg at one end to Fully Floating at the other; Why the Balance of Payments must always balance under Floating Exchange Rates but need not balance under a Fixed or Managed Exchange Rate regime.

Exchange Rate crises – The relation between Exchange Rate crises and other kinds of

crises (banking crises, financial crises, etc.).

**Module 4: International Monetary History, 1900-present:**

The Gold Standard – The Inter-War Period and the Great Depression – 1944, Bretton Woods System and its collapse ; Fixing in Europe via ERM, and the Dollar Standard elsewhere.

The Maastricht Treaty and preparations for the Euro; The Global Financial Crisis and its consequences for the Euro; The Euro Crisis, Asia Infrastructure Investment Bank (AIIB), New Development Bank (NDB).

**References:**

1. Blanchard, Oliver, Macroeconomics , Pearson education, New Delhi, India, 2008.
2. Dornbusch R S, Fischer and R Startz; Macroeconomics, 8e Tata Mc Grow Hill, New Delhi, 2004.
3. Froyen, R. T.; Macroeconomics : Theory and Policy, Pearson Education Asia, Delhi, 2001.
4. Mankiw, Gregory; Macroeconomics, 6e, Worth Publishers, New York, 2003.
5. Salvatore, D.; International Economics, Printice Hall, New York, 1997 .
6. Robert C Feenstra & Alan M Taylor , International Trade, Worth Publishers, 2014.

**INTERNATIONAL ECONOMICS: PAPER XIV**

**SEMESTER –VI**

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - I	COMPULSORY PAPERS		
ECOINT602	INTERNATIONAL ECONOMICS: PAPER XIV	4	100

**Preamble:**

*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 builds on the models of open economy macroeconomics focussing on national policies as well as international monetary systems. It concludes with an analytical account of the causes and consequences of the rapid expansion of international financial flows in recent years.*

**Module 1: Introduction**

Importance of the study of International Economics - An overview of world trade- Distinction between domestic & international Trade -Concepts of Cost Difference , Adam Smith’s Theory of International Trade, The Ricardian Theory.

## **Module 2: Modern Theories of International Trade**

Heckshcher- Ohlin Theory of International Trade, Factor Abundance: Two Criteria, Leontief Paradox, Haberler's theory of Opportunity Cost, Law of reciprocal demand and offer curves, Role of Factor Accumulation, Stolper-Samuelson theorem.

## **Module 3: Importance of Trade and Recent trends:**

Monopolistic competition and trade - firm heterogeneity, FDI: The concept and role, FDI Inflows- FDI Outflows, and the global supply chain, Business Process Outsourcing.

## **Module 4: Trade Policy and Regionalism**

Instruments of trade policy; Why countries cooperate? -GATT, GATS, Regional Trade Agreements - controversies in trade policy (labour standards, IPR and environment) - ASEAN, SAARC, SAFTA, Protectionism.

## **References:**

1. Paul Krugman, Maurice Obstfeld, and Marc Melitz, International Economics: Theory and Policy, Addison-Wesley (Pearson Education Indian Edition), 9th edition, 2012.
2. Dominick Salvatore, International Economics: Trade and Finance, John Wiley International Student Edition, 10th edition, 2011.
3. Gordon Hanson, „The Rise of Middle Kingdoms: Emerging Economies in Global Trade”, Journal of Economic Perspectives, Spring 2012.
4. Melitz M. and Trefler D., “Gains from Trade When Firms Matter”, Journal of Economic Perspectives, Spring 2012.
5. Kindleberger Charles P, International Economics, Homewood, USA, 1978
6. Bo Sodersten and Geoffrey Reed, International Economics, Palgrave Macmillan, 1994.

## **INDIAN FINANCIAL SYSTEM: PAPER XV**

### **SEMESTER – VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOIFSA603</b>	<b>INDIAN FINANCIAL SYSTEM : PAPER- XV</b>	<b>3</b>	<b>80</b>

### **Preamble:**

*The basic purpose of this paper is to acquaint students with various components of the Indian financial system, its working and the trends that have taken place over the years especially since financial sector reforms.*

## **Module 1: Indian Financial System: Structure, Trends and Turns**

Meaning and components of the Financial System - Financial System and Economic Development - Indicators of Financial Development: FR, FIR, NIR and IR – Overview of financial sector reforms since 1990s – Trends and turns in Indian financial sector: 1950-2017.

### **Module 2: Banking in India since 1990s.**

Developments in Commercial banking sector since 1990s – Management of Non-Performing Assets (NPAs); Capital Adequacy Norms - Basel Accord III - Monetary policy of the RBI –

Changes in RBI monetary policy since 1990s - Monetary Policy Committee (MPC), Payment Banks, Mudra Bank- Transmission Channels of Monetary policy.

### **Module 3: Money and Capital Markets in India:**

Money Market: Components of organized money market – Reforms in the money market - Features of Indian Money Market.

Capital Market: Structure of the Indian Capital Market – Recent Developments in the Capital Market – Role of SEBI - Interlink between Money Market and Capital Market - Overview of Debt Market in India – Islamic Banking, Merchant Banking and Investment Banking.

### **Module 4: Non-Banking sector of the Financial System:**

Non-Bank Finance Companies (NBFCs) in India and their progress - Developments in India's Insurance sector – Progress of Mutual Funds industry in India - Credit Rating Agencies in India.

### **References:**

1. Pathak, Bharati, The Indian Financial System –Markets, Institutions, and Services, Pearson Education, New Delhi, 2008.
2. Bhole, L. M, Financial Institutions and Markets, Growth and Innovation, Tata McGraw-Hill, New Delhi, 2008.
3. Khan, M.Y, Financial Services, Tata McGraw Hill, New Delhi, 2007.
4. Reserve Bank of India (various issues) Report on Currency and Finance, RBI, Mumbai.
5. Rakesh Mohan & Partha Ray, Indian Financial Sector: Structure, Trends & Turns; IMF Working Paper (WP/17/7). <https://www.imf.org> Issues > 2017/01/20
6. Dutta Abhijit, Indian Financial System, Excel Books, Delhi, 2012.

# ECONOMICS OF AGRICULTURE AND COOPERATION : PAPER XV

## SEMESTER VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOECB603	ECONOMICS OF AGRICULTURE AND COOPERATION :PAPER XV	3	80

### **Preamble:**

*The paper is designed to provide various aspects related to the principles of cooperation and cooperative organizations in the globalized economy. The essentials of cooperative finance are dealt in with reference to the latest trends.*

### **Module 1: Co-operation:**

Meaning and features of Co-operation - Principles of Co-operation (Manchester-1995) – Role of Co-operation in Economic development - Globalization and Co-operation- Importance and Benefits of Co-operation, Use of Big data Artificial Intelligence (AI) in Indian Agriculture.

### **Module 2: Co-operative Finance in India:**

Co-Operative Finance: Need, Structure, Progress and Problems - National Co-operative Development Corporation (N.C.D.C.), Aadhar as KYC Norm for Agricultural Finance - Farmers service societies and urban Co-operative banks.

### **Module 3: Agricultural Co-operatives:**

Role and Types of Agro-Industries - Problems and Measures of Agro-Industries – Sugar and Dairy Co-operatives - Food and Fruits Processing Industry - Co-Operative Farming.

### **Module 4: Co-operative Organizations in India:**

Consumer Co-operatives - Co-Operative Marketing - Housing Co-operative societies - Labour Co-operative societies - Agricultural Marketing societies- Leadership in Cooperative development.

### **References:**

1. R. D. Bedi, Theory, History and Practice of Co-Operation, International Publishing House, Meerut(U.P.), 1983.
2. Mathur B. S, Co-Operation in India, Sahitya Bhavan, Agra, 2000.
3. John Matthai, Agricultural Co-Operation in India , Reliance Publishing House, New Delhi, 1925.
4. Krishnaswami, Fundamentals of Co-Operation, S. Chand and Company Ltd, New Delhi, 1985.
5. Hajela T.N, principles, problem and practice of Co-operation, Agarwal publication, New

Delhi, 2000.

6. Government of Maharashtra - Co-operative movement at a Glance (latest annual report).

## **INDUSTRIAL AND LABOUR ECONOMICS: PAPER XV**

### **SEMESTER – VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOILEC603</b>	<b>INDUSTRIAL AND LABOUR ECONOMICS :PAPER XV</b>	<b>3</b>	<b>80</b>

#### **Preamble:**

*Issues pertaining to the labour market, wage policy, trade unions and amicable solutions to industrial disputes have become vital for developing countries, especially for India, where the bulk of the labour force is employed in the unorganised sector, and the organized sector is witnessing a phenomenon of 'jobless' growth. This paper intends to provide knowledge of the same and also discusses the importance of labour welfare and social security measures for the growing labour force in India.*

#### **Module 1 : Introduction – Indian Labour Market**

Characteristics of the Indian Labour Market - Child Labour and Female Labour – Problems and Measures- Globalisation and Indian Labour Market -Labour Market Reforms – Exit Policy and Need for Safety Nets - Second National Commission on Labour.

#### **Module 2 : Trade Unionism**

Definition and Functions of Trade Unions- Historical Evolution of Trade Unions in India and Their Present Status - Problems of Trade Unions in India - Role of Outside Leadership

#### **Module 3 : Industrial Relations**

Causes of Industrial Disputes and Their Settlement Mechanism - Collective Bargaining – Concept, Features, Importance and Pre-requisites for Successful Collective Bargaining - Collective Bargaining in India - Workers’ Participation in Management –Concept, objectives and Forms of Workers’ Participation in India.

#### **Module 4 : Labour Welfare and Social Security**

Concept, Theories and Principles of Labour Welfare - Agencies for Labour Welfare - Role of the Labour Welfare Officer - Social Security – Concept; Social Assistance and Social Insurance - Social Security Measures in India - International Labour Organization

and Its Impact on Indian Labour Legislations.

**References:**

1. Datt R. and Sundaram K.P.M, Indian Economy, S.Chand & Co., New Delhi, 2009.
2. Mamoria C.B. and Mamoria S, Dynamics of Industrial Relations, Himalaya Publishing House, Mumbai, 2002.
3. Mishra S.K. and Puri V.K, Indian Economy, Himalaya Publishing House, Mumbai, 2002.
4. Monappa A, Industrial Relations, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006
5. Ratna Sen, Industrial Relations in India - Shifting Paradigms, Macmillan, New Delhi, 2005.
6. Singh J.K, Labour Economics – Principles, Problems and Practices, Deep andDeep Publications Pvt. Ltd., New Delhi, 1998.

**MATHEMATICAL AND STATISTICAL TECHNIQUES FOR  
ECONOMIC ANALYSIS: PAPER –XVI**

**SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOMSEA604</b>	<b>MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS :PAPER- XVI</b>	<b>4</b>	<b>100</b>

**Preamble:**

*This paper proposes to equip the students with analyzing skills with sound footing of relevant mathematical and statistical techniques. Economic analysis and interpretation of data cannot be carried out in the absence of knowledge of these techniques narrated here.*

**Module1: Techniques and applications of partial derivatives**

Functions of several variables and partial derivatives - Second order partial derivatives - Optimisation of multivariable functions - Constrained optimisation with Lagrange multiplier and its economic interpretation - Marginal productivity, Income and price elasticity of demand - Homogeneous production functions and returns to scale - Cobb-Douglas production function

**Module 2: Integral Calculus:**

Integration and Definite integral; area under the curve - Economic applications - Present value of cash flows(present value of a sum to be received in future and present value of a stream of future income) - Consumer's and Producer's Surplus- Learning curve.

**Module 3: Correlation and Regression:**

The meaning and significance of Correlation; Scatter plot of Bivariate Distributions; Correlation and Causation - Karl Pearson's coefficient of correlation: Spearman's rank correlation coefficient - Simple regression analysis- Method of Least Squares and Regression Lines, Regression Coefficients, Relationship between correlation coefficients and regression coefficients.

**Module 4: Index Numbers and Time Series:**

Simple and composite index numbers- Construction, uses and problems of index numbers- Laspeyre's, Paasche's and Fisher's Index numbers- Cost of living index numbers-real income – wholesale price index number- Splicing of index numbers, Components of time series, Estimation and forecasting of trend by the Least Squares Method.

**References:**

1. Dowling Edward T: Introduction to Mathematical Economics, Schaum's Outline Series in Economics, Tata McGraw Hill, New Delhi, 2004.
2. Lerner Joel J and P. Zima: Theory and Problems of Business Mathematics, McGraw Hill, New York, 1986.
3. Dowling Edward T: Theory and Problems of Mathematical methods for Business and Economics, McGraw –Hill, 1993
4. Gupta S.P.: Statistical Methods, S. Chand, New Delhi.
5. Sancheti D.C. and V.K. Kapoor: Statistics-Theory, Methods and Applications, S. Chand, New Delhi, 2014.
6. Chiang A.C: Fundamental Methods of Mathematical Economics, 3rd ed., McGraw-Hill, 1984.

**RESEARCH METHODOLOGY: PAPER XVI**

**SEMESTER –VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECORMB604</b>	<b>RESEARCH METHODOLOGY :PAPER XVI</b>	<b>4</b>	<b>100</b>

**Preamble:**

*This paper is designed with a goal to strengthen the critical thinking and listening skills in conducting economic research and to device research outcomes in an impeccable way. The entire course is based on the broad social sciences spectrum.*

**Module 1: Statistical applications in research:**



Methods of studying Correlation- measurement of simple correlation: graphic method: scatter diagram - coefficient of correlation - Karl Pearson and rank correlation interpretation of  $r = \pm 1$

Linear Regression analysis: meaning, regression lines, regression coefficients, regression equations, relationship between correlation and regression.

Analysis of Time Series – components –trend analysis- moving averages (3, 4 and 5 yearly)- method of least square.

### **Module 2: Index numbers:**

Meaning – classification – problems encountered while constructing index numbers- uses and limitation of index numbers, Methods of constructing index numbers: Simple index: i) aggregate method ii) simple average of relatives method, Weighted index: Laspeyer's, Paache's and Fisher's index – weighted average of relatives method, Chain based index – concepts of Base shifting, splicing, and deflating, Consumer price index: meaning, need and construction – methods: aggregate expenditure method and family budget method.

### **Module 3: Hypothesis formulation and Hypothesis Testing:**

Definition and functions of hypothesis –Criteria of workable hypothesis – forms and sources of hypothesis- Concepts in Testing of Hypothesis: Universe / Population, parameter and statistic, Null and Alternative Hypotheses, Levels of Significance, critical region, Type I and Type II errors - Point and Interval Estimates.

### **Module 4: Research Report Writing:**

Types of Research Report: Technical, Popular, Interim, Summary, Article- Format of a Research Report- Principles of writing the Research Report: Organization and Style - Contents-Styles of reporting- Steps in drafting Reports- Editing the final draft-Evaluating the final draft -Organization of the Research Report: Preliminaries, Contents of Report, Structuring the Report: Chapter format- Pagination- Identification- Using quotations- Presenting footnotes –abbreviations- Presentation of tables and figures- Referencing- Documentation-Use and format of appendices- Indexing - Bibliography, Appendices.

### **References:**

1. Goode J. William & Hatt K. Paul, Methods in social Research, New York, McGraw-Hill, 1952.
2. Kothari, C.R (2004) Research Methodology: An Introduction, Delhi, New Age, 2004.

3. Krishnaswami, O.R & M. Ranganathan , Methodology of Research in Social Sciences, Himalaya Publishing House, Mumbai, 2011.
4. Kumar, Renjith (2009) Research Methodology: A Step by Step Guide for Research, Delhi, Pearson Education, 2009.
5. P.Saravanavel Research Methodology, KitabMahal, Allahabad, 1987.
6. Gupta S P Statistical Methods Sultan Chand and Sons, New Delhi, 1987.

## **INDIAN ECONOMIC THOUGHT: PAPER XVI**

### **SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOIETC604</b>	<b>INDIAN ECONOMIC THOUGHT : PAPER XVI</b>	<b>4</b>	<b>100</b>

#### **Preamble:**

*The history of Indian economic thought provides rich insights into both economic issues and the workings of the Indian mind. It will give the student an introduction to major Indian thinkers and their ideas on Indian economic policy.*

#### **Module 1: The Modernists**

Naoroji :- Drain theory, criticism and long run relevance, Ranade's views on railway investment and the methodology of Indian economics, Gokhale:-Gokhale and the economics of education, the rupee ratio debate , Dr. Ambedkar's contribution to the rupee debate.

#### **Module 2: Agriculture, Poverty and Famines**

Why do famines occur? Famine policy, criticism of famine policy, Ranade's views on Poverty and Industrialisation, agrarian policy, contribution of Dr.B.R.Ambedkar.

#### **Module 3: Economic Policy after Independence**

Nehruvian economics –Mahalonobis model and planning, industrial stagnation, industry and trade, agriculture and the wage goods model , reappraisal of Nehru's economics

#### **Module 4: Economic Thought in Contemporary India**

Measurement of poverty, liberalisation, privatisation and globalisation, Human development and AmartyaSen's contribution, JagadishBhagawati's contribution.

## References:

1. Jadhav Narendra, Ambedkar : An Economist Extraordinaire , Konark Publishers, New Delhi, 2015.
2. Dasgupta A.K.(1993) : A History of Indian Economic Thought , Routledge, 1993.
3. Balkrishnan P. , The Recovery of India: Economic Growth in the Nehru Era, Economic and Political Weekly, Vol. 42, No. 45/46 (Nov. 10 - 23, 2007), pp. 52-66, 2007.
4. A.Sen: Development as capabilities Expansion, [http://morgana.unimore.it/Picchio\\_Antonella / Sviluppo%20umano/svilupp%20umano/Sen%20development.pdf](http://morgana.unimore.it/Picchio_Antonella/Sviluppo%20umano/svilupp%20umano/Sen%20development.pdf)
5. A.Pangariya: Why Growth Matters: How India's Growth Acceleration has Reduced Poverty, [http://www.cde.org.za/wp-content/uploads/2013/09/Prof%20Arvind%20Panagariya Why% 20growth% 20matters\\_% 20How% 20Indias% 20growth% 20acceleration% 20has% 20reduced% 20poverty.pdf](http://www.cde.org.za/wp-content/uploads/2013/09/Prof%20Arvind%20Panagariya%20Why%20growth%20matters_%20How%20Indias%20growth%20acceleration%20has%20reduced%20poverty.pdf)
6. Deaton Angus(2013) : What is Going on in India, [https://scholar.princeton.edu/sites/default/ files/deaton/files/deaton\\_book\\_review\\_sen\\_dreze\\_etc\\_lancet\\_2013\\_0.pdf](https://scholar.princeton.edu/sites/default/files/deaton/files/deaton_book_review_sen_dreze_etc_lancet_2013_0.pdf)

## THEORY AND PRACTICE OF ECONOMETRICS: PAPER XVII

### SEMESTER VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECOTPEA605	THEORY AND PRACTICE OF ECONOMETRICS : PAPER XVII	4	100

#### Preamble:

*The paper is aims to help students understand the art of model building. It focuses on building the appropriate model and testing it statistically and to apply it to the practical problems in forecasting and analysis.*

#### **Module 1: Econometric Model Specification:**

Identification: Structural and reduced form - Omitted Variables Bias- Errors in measurement- Endogeneity and Bias.

#### **Module 2: Failure of Classical Assumptions**

Multi-collinearity and its implications - Auto-correlation: Consequences and Durbin-Watson test- Heteroskedasticity: Consequences and the Goldfeld -Quandt test.

#### **Module 3: Forecasting:**

Forecasting with a) moving averages b) linear trend c) exponential trend- CAGR- Forecasting with linear regression- Classical time series decomposition- Measures of forecast performance: Mean Square Error and Root Mean Square Error - Limitations of econometric forecasts.

#### **Module 4: Linear Programming:**

Linear programming - Dual of a linear programming problem - Simplex method - Transportation.

#### **References:**

1. Damodar N. Gujarati, Basic Econometrics, McGraw-Hill, Delhi, 2003.
2. Kapoor V. k. (2011), Operations Research Problems & Solutions, Sultan Chand & sons.
3. Lipschutz (Schaum Series), Theory and Problems of Statistics.
4. Wooldridge Jeffery M., Introductory Econometrics: A Modern Approach. 6th edition, Cengage Learning, USA, 2016.
5. Stock James H. and Watson Mark W., Introduction to Econometrics, Updated 3rd Edition, Global Edition, Pearson Education Limited, 2015.
6. Makridakis Spyros and Steven C Wheelright, Forecasting Methods and Applications, Willey Publications, 2008.

### **APPLIED ECONOMETRICS: PAPER XVI**

#### **SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOAE605</b>	<b>APPLIED ECONOMETRICS: PAPER XVI</b>	<b>4</b>	<b>100</b>

#### **Preamble:**

*The aim of this course is to provide a foundation in applied econometric analysis and to develop skills required for empirical research in economics. Topics include specification and selection of regression models, dynamic econometric models, advanced methods in regression analysis and panel data models. Since the emphasis is on application of methods, this course requires understanding of econometric software and computing skills.*

#### **Module 1: Violations of Assumptions in the Linear Regression model:**

Heteroscedasticity, implications, testing and remedy, autocorrelation, implications, testing and remedy, multicollinearity

#### **Module 2: Regression Diagnostics and Specification:**

Misspecification; functional forms; model selection, endogeneity and instrumental variables

### **Module 3: Advanced Topics in Regression Analysis:**

Dynamic Econometric Models: distributed lag models; autoregressive models; simultaneous equation models.

### **Module 4: Introduction to Panel Data and Research softwares.**

What is a Panel data? Difference with Time Series Data- Multivariate data, Regression with Panel data, General Introduction to Research Softwares like R, Eviews and SPSS.

#### **Readings:**

1. Jeffrey M. Wooldridge, *Econometrics*, Cengage Learning, India Edition, 2009.
2. Dimitrios Asteriou and Stephen Hall, *Applied Econometrics: A Modern Approach*, Palgrave Macmillan, 2007.
3. Damodar Gujarati, *Econometrics by Example*, Palgrave Macmillan, 2011.
4. Kleiber C and Zeilis A, *Applied Econometrics with R*, Springer, Use R1, 2008.
5. Baltagi B H, *Econometric Analysis of Panel data*, Wiley Publications, 2013.
6. Walters Enders, *Applied Econometric Time Series*, Wiley Publications, USA, 2014.

# DEVELOPMENT THEORY AND EXPERIENCE: PAPER XVII

## SEMESTER VI

COURSE CODE	PAPER TITLE	CREDITS	MARKS
GROUP - II	ELECTIVE PAPERS		
ECODTEC605	DEVELOPMENT THEORY AND EXPERIENCE : PAPER XVII	4	100

### **Preamble:**

*This is the second paper of economic development sequence. 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 markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The course ends with the issues related to environment and development.*

### **Module I: Demography and Development:**

Demographic concepts; birth and death rates, age structure, fertility and mortality; demographic transitions during the process of development; gender bias in preferences and outcomes and evidence on unequal treatment within households; connections between income, mortality, fertility choices and human capital accumulation.

### **Module II: Structural Transformation:**

The Lewis model –Clark-Fisher model of structural change , Urbanization: Trends and Projections with reference to India, Urbanization and Development, Causes of urbanization, Urban informal sector, Policies for the urban informal sector, Migration and development, Economic theory of rural-urban migration: Harris-Todaro migration model

### **Module III: Land, Labor and Credit Markets:**

Role of Agriculture in Economic Development, Market Failure and Agriculture, The distribution of land ownership; Land reform and its effects on productivity; contractual relationships between tenants and landlords; Land Acquisition; Nutrition and Labour Productivity; Rural Credit Market; Microfinance; Inter-linkages between Rural Factor Markets.

### **Module IV: The Environment and Development:**

The core of environmental problems- Rural poverty and environmental destruction- industrialization and environmental pollution - Economic models of environmental issues: privately owned resources, common property resources, public goods: regional environmental degradation and the free rider problem, limitations of public goods

framework.

**References:**

1. Debraj Ray, Development Economics, Oxford University Press,2009.
2. Partha Dasgupta, Economics: A Very Short Introduction, Oxford University Press,2007.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press,2006.
4. Amartya Sen, Development as Freedom, Oxford University Press,2000.
5. Daron Acemoglu and James Robinson, Economic Origins of Dictatorship and Democracy, Cambridge University Press,2006.
6. Michael Todaro and Stephen Smith : Economic Development,11<sup>th</sup> edition, Pearson

**INTERNATIONAL TRADE, POLICY AND PRACTICE  
: PAPER XVIII**

**SEMESTER VI**

<b>COURSE CODE</b>	<b>PAPER TITLE</b>	<b>CREDITS</b>	<b>MARKS</b>
<b>GROUP - II</b>	<b>ELECTIVE PAPERS</b>		
<b>ECOITPP606</b>	<b>INTERNATIONAL TRADE, POLICY AND PRACTICE : PAPER- XVIII</b>	<b>3</b>	<b>80</b>

**Preamble:**

*This course is designed for addressing changing phase of International Trade Policy and Practice. The main purpose of this course is to expose students to current trends in International developments.*

**Module 1 :Introduction**

Inter regional and international trade, Role of Dynamic factors i.e. change in Tastes, Technology and Role of Factor Accumulation.

Foreign Exchange Rate: Concepts - Short and Forward rates - Foreign Exchange rate determination – Fixed and flexible exchange rate – Interrelationship between exchange rates and Interest rates.

Exchange Rate system in India, managed floating, Current and Capital Account

Convertibility and their impact, FEMA.

## **Module 2 : Emerging new International Economic Order**

GATT, Uruguay Round, WTO, WTO Agreement, Dispute settlement Mechanism, Impact of WTO on Emerging Economies and India, Doha Round and implications of its failure- Emergence of Regional Free Trade agreements (FTA), Bilateral Investment Treaty (BIT), Double Taxation Avoidance Agreement (DTAA).

## **Module 3 :International Financial Institutions and International Debt Problem.**

IMF, World Bank, Asian Development Bank (ADB) –New Development Bank (NDB), Asia Infrastructure Investment Bank (AIIB) and their role with special reference to India. South East Asian Crisis and Lessons for India, Global Economic Crisis, Global Financial Crisis of 2008, International Debt Problem – Emerging Global Financial Architecture.

## **Module 4: Role of Foreign Capital Flow**

Factors determining Foreign Investment, Foreign Institutional Investment (FII), Qualified Foreign Investment (QFI), Foreign Portfolio Investment (FPI), Role of FDI in Economic Development- Factors influencing FDI inflows- Green Field and Brown field FDI in India, Foreign Investment and Role of MNCs in India.

### **References:**

1. Robert J Carbaugh, International Economics, South-Western Cengage Learning, USA, 2017.
2. Paul R Krugman, Maurice Obstfeld and Melitz Mark, International Economics: Theory and Policy, Princeton University, USA, 2015.
3. Dennis R Appleyard, Alfred J Field, International Economics, McGraw-Hill, USA, 2013.
4. Robert J Carbaugh, International Economics(With Xtra! and Info Trac), South Western College Pub, 2003.
5. Kindleberger Charles P., International Economics,3rd edition, R. D. Irwin, Homewood, IL, 1963.
6. Bo Sodersten and Geoffrey Reed, International Economics, 3rd Edition, Palgrave Macmillan; (May 15, 1994)



**UNIVERSITY OF MUMBAI**



**Syllabus for the F.Y.B.Sc.**

**Program: B.Sc.**

**Course: Chemistry**

**(Credit Based Semester and Grading System with  
Effect from the academic year 2014-2015)**

## F.Y.B.Sc. Chemistry Syllabus

For Credit Based Semester and Grading System  
To be implemented from the Academic year 2014-2015

### SEMESTER I

Course Code	Unit	Topics	Credits	L/Week
USCH101	I	Chemical Thermodynamics-I Chemical Kinetics – I	2	1
	II	Molecular Spectroscopy-I Polymers-I Recent trends Scope and Introduction to Analytical Chemistry		1
	III	Calibration of Glassware and Chemical Calculations		1
USCH102	I	Atomic Structure Periodic Table and Periodicity of Properties Chemical Bonding	2	1
	II	Bonding and Structure of Organic Compounds Types of Arrows		1
	III	Nomenclature of Organic Compounds Fundamentals of Organic Reaction Mechanisms Concept of Carbon Acid Reagents Recent Trends in Chemistry		1
USCHP1			2	6

## SEMESTER II

<b>Course Code</b>	<b>Unit</b>	<b>Topics</b>	<b>Credits</b>	<b>L/Week</b>
<b>USCH201</b>	<b>I</b>	<b>Gaseous State Nuclear Chemistry</b>	<b>2</b>	<b>1</b>
	<b>II</b>	<b>Buffers Oxidation &amp; Reduction Introduction to Gravimetric Analysis</b>		<b>1</b>
	<b>III</b>	<b>Titrimetric Analysis –I</b>		<b>1</b>
<b>USCH202</b>	<b>I</b>	<b>Comparative Chemistry of Main Group Elements Comparative Chemistry of Carbides , Nitrides , Oxides and Hydroxides of Group-I and II Elements</b>	<b>2</b>	<b>1</b>
	<b>II</b>	<b>Acid-Base Theories Stereochemistry of organic Compounds</b>		<b>1</b>
	<b>III</b>	<b>Mechanism of organic reactions Functional group interconversion</b>		<b>1</b>
<b>USCHP2</b>			<b>2</b>	<b>6</b>

Course Code	Credits
<b>USCH101</b>	<b>2 Credits (45 Lectures)</b>
<p><b>Unit I :</b></p> <p><b>1.1 CHEMICAL THERMODYNAMICS-I (8L)</b></p> <p>Thermodynamic terms: System, Surrounding, Boundaries Sign Conventions, State Functions, Zeroth law- Statement, Internal Energy and Enthalpy: Significance, examples, (Numericals expected.)</p> <p>First law of Thermodynamics and its limitations, Second law – Statements and discussion, Mathematical expression.</p> <p>Qualitative discussion of Carnot cycle for ideal gas and mechanical efficiency, (Numericals expected.)(Derivation not expected). Concept of Entropy, Entropy for isobaric, isochoric and isothermal processes (derivation expected).</p> <p><b>1.2 CHEMICAL KINETICS – I (7L)</b></p> <p>Rate of Reaction, rate constant, Measurement of Reaction Rates Order &amp; Molecularity of reaction, Integrated rate equation of first and second order reactions (with equal initial concentration of reactants). (Numericals expected) Determination of order of reaction by a) Integration method b) Graphical Method c) Ostwald's Isolation Method d) Half Time method. (Numericals expected).</p>	<p><b>15</b></p> <p><b>Lectures</b></p>
<p><b>Unit II:</b></p> <p><b>2.1 MOLECULAR SPECTROSCOPY-I (4L)</b></p> <p>Electromagnetic radiation, Electromagnetic Spectrum, Planck's equation, Interaction of EMR with matter-Absorption, Emission, Scattering, Fluorescence, Electronic, Vibrational and Rotational transitions. (Numericals expected).</p> <p><b>2.2 POLYMERS-I (3L)</b></p> <p>Monomer, Repeat Unit, Polymer, Linear and Branched polymers, Homopolymer, Copolymer, Types of copolymers-Random, Block, Alternate,</p>	<p><b>15</b></p> <p><b>Lectures</b></p>

<p>Graft. Natural Polymers-Source, Structure &amp; Properties of Starch, Cellulose, Protein, Silk, Wool, Rubber.</p> <p><b>2.3 RECENT TRENDS (1L)</b></p> <p>Introduction to Premier Indian research Institutes in Chemistry, Shantiswaroop Bhatnagar Awardees in last 5 years in Chemistry.</p> <p><b>2.4 Scope and Introduction to analytical chemistry (7L)</b></p> <p><b>2.4.1 Analytical chemistry</b></p> <p>Qualitative and Quantitative analysis, Chemical analysis –Based on nature of information of the sample sought and based on size of the sample used, Classification of analytical method-Classical and Instrumental methods – types, advantages and disadvantages</p> <p><b>2.4.2 Steps involved in Chemical analysis</b></p> <p>Purpose of analysis, Sampling, Selection of a method for analysis-Factors, Processing of the sample, Actual analysis, Processing data, Presentation of results and Interpretation of results.</p> <p><b>2.4.3 Applications of analytical methods in various fields</b></p> <p>Organic, Pharmaceuticals, Electronic and Environmental analysis</p>	
<p><b>Unit III:</b></p> <p><b>3.1 Calibration of Glass ware and Chemical calculations (15L)</b></p> <p><b>3.1.1</b> Calibration of pipette, volumetric flask, Burette</p> <p><b>3.1.2</b> Measurements in analytical chemistry</p> <p>S.I units -Fundamental Units (Mass, amount of substance, distance, time, temperature, current) and Derived Units (Area, Volume, density, velocity, force, pressure, energy, heat, work, power, charge, potential, resistance, frequency) (S.I Units and Symbol only)</p> <p><b>3.1.3</b> Uncertainty of measurements</p> <p>Significant figures- concept, Rules and examples (Numericals expected)</p>	<p><b>15</b></p> <p><b>Lectures</b></p>

### 3.1.4 Chemical calculations

Expressing concentration of solutions –Normality, Molality, Molarity, Formality, interconversion between molality and molarity , Mole fraction, Weight ratio, Volume ratio, Weight to volume ratio, ppb,ppm,millimoles,milliequivalents  
(Numericals expected)

Course Code	Credits
USCH102	2 Credits (45 Lectures)
<p><b>Unit I:</b></p> <p><b>1.1 Atomic Structure.</b> Structure of Atom: (5L) Rutherford's Atomic Model; Bohr's Theory; dual Nature of electrons; Heisenberg's Principle of uncertainty; Quantum Numbers; Pauli Principle</p> <p><b>1.2 Periodic Table and Periodicity of Properties.</b> (5L) Long form of Periodic Table; Classification of elements as main group, transition, and inner transition elements; Periodicity in the following properties: Atomic and ionic size; electron gain enthalpy; ionization enthalpy, effective nuclear charge (Slater rule); electronegativity :Pauling, Mulliken and Allred Rochow electronegativities . (Numerical problems expected, wherever applicable)</p> <p><b>1.3 Chemical Bonding (5L)</b> Types of chemical bonds; Comparison between ionic and covalent bonds; polarizability (Fajan's Rules) Shapes of simple molecules: Lewis Dot structures; Sidgwick-Powell theory; Basic VSEPR Theory for AB<sub>n</sub> type molecules with and without lone pair of electrons, isoelectronic Principle; Applications and Limitations of VSEPR Theory.</p>	<p><b>15</b> <b>Lectures</b></p>
<p><b>Unit II:</b></p> <p><b>2.1 Concept of Qualitative Analysis: (7L)</b> (Macro, Semi-Micro, Micro, Ultra Micro, Trace Analysis) Testing of Gaseous Evolutes, Role of Papers impregnated with Reagents in qualitative analysis (With reference to papers impregnated with Starch-Iodide, Potassium Dichromate, Lead acetate, Dimethyl Glyoxime, and Oxine reagents) (balanced Chemical Reactions expected). Precipitation Equilibria: Effect of Common Ions, Uncommon Ions; Oxidation State, Buffer Action,</p>	<p><b>15</b> <b>Lectures</b></p>

<p>Complexing agents on precipitation of ionic compounds. (Balanced Chemical Equations and Numerical Problems Expected)</p> <p><b>2.2 Bonding and structure of organic compounds (4L)</b></p> <p>2.2.1 Hybridisation of carbon, oxygen and nitrogen atoms in the following functional groups; orbital overlap and shapes of the specified molecules containing these functional groups : alcohol (methyl alcohol), ether (dimethyl ether), aldehyde (formaldehyde), ketone (acetone), carboxylic acid (acetic acid), ester (methyl acetate), cyanide (methyl cyanide), amine (methyl amine), amide (acetamide).</p> <p><b>2.3 Types of arrows. (4L)</b></p> <p>2.3.1 Electronic effects in organic molecules: Inductive effect (or polarisation), polar covalent bonds and dipole moment. Delocalised bonds and resonance - drawing resonance structures, concept of formal charge hyperconjugation.</p> <p>2.3.2 Aromaticity: Characteristics of aromatic compounds, criteria for aromaticity, resonance energy, Huckels rule, benzenoid hydrocarbons (benzene, naphthalene, anthracene and phenanthracene)</p> <p>2.3.3 Bonds weaker than a covalent bond: Hydrogen bond – intermolecular hydrogen bonding in alcohols - effect on b.p. and solubility; Van der Waal's forces in straight and branched chain alkanes.</p>	
<p><b>Unit III:</b></p> <p><b>Nomenclature of organic compounds</b></p> <p><b>3.1</b> Review of basic rules of IUPAC nomenclature. (2L)</p> <p><b>3.2.</b> Nomenclature of mono &amp; bi-functional aliphatic compounds on the basis of priority order of the following classes of compounds: alkanes,</p>	<p><b>15</b></p> <p><b>Lectures</b></p>



alkenes, alkynes, haloalkanes, alcohols, ethers, aldehydes, ketones, carboxylic acids, carboxylic acid derivatives (acid halides, esters, anhydrides, amides), nitro compounds, nitriles & amines; including their cyclic analogues. (3L)

### **3.3 Fundamentals of organic reaction mechanisms. (4L)**

3.3.1 Reactive intermediates:

3.3.2 Carbon radicals (alkyl, Allyl, Benzyl) Formation, structure and stability based on resonance and hyperconjugation.

3.3.3 Carbocations and carbon radicals [alkyl, allyl, benzyl]: Formation, structure and stability based on inductive effect, resonance and hyperconjugation.

3.3.4 Carbanions : Formation, structure and stability based on inductive effect, resonance and s-character of trichloromethyl carbanions, allyl carbanions, benzyl carbanions, carbanions from terminal alkynes and active methylene compounds.

### **3.4. Concept of carbon acid. (1L)**

### **3.5 Reagents: (3L)**

3.5.1 Electrophiles and nucleophiles.

3.5.2 Acids and bases : Lowry-Bronsted and Lewis concepts.

3.5.3 Acidity and basicity of organic compounds based on inductive effect and resonance with reference to acid characters of alcohols, phenols and carboxylic acids and basic characters of aliphatic amines and aniline .

### **3.6 Recent trends in Chemistry (2L)**

3.6 .1 Introduction to research journals in chemistry.

3.6.2 Nobel prize winners in Chemistry in last 5 years.

Course Code	Credits
USCHP1	2 Credits
<b>PRACTICAL COURSE PHYSICAL CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>To determine the rate constant for the hydrolysis of ester using HCl as catalyst.</li> <li>To determine the rate constant for the hydrolysis of ester using H<sub>2</sub>SO<sub>4</sub> as catalyst, using scientific calculator by Regression analysis.</li> <li>To determine the rate constant for the saponification reaction between ethyl acetate and NaOH by back titration method.</li> <li>To determine enthalpy of dissolution of salt (like KNO<sub>3</sub>).</li> </ol>	
<b>PRACTICAL COURSE ANALYTICAL CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>Determination of amount of NaHCO<sub>3</sub> + Na<sub>2</sub>CO<sub>3</sub> in the given solid mixture titrimetrically.</li> <li>Determination of the amount of Potassium oxalate and oxalic acid in the given solution titrimetrically</li> <li>Determination of % composition of BaSO<sub>4</sub> and NH<sub>4</sub>Cl in the given mixture gravimetrically.</li> <li>Determination of % composition of ZnO and ZnCO<sub>3</sub> in the given mixture gravimetrically.</li> </ol>	
<b>PRACTICAL COURSE INORGANIC CHEMISTRY</b>	
<p>Semi-Micro Inorganic Qualitative Analysis of a sample containing Two Cations and Two Anions. Cations: (from amongst) Pb<sup>2+</sup>, Ba<sup>2+</sup>, Ca<sup>2+</sup>, Sr<sup>2+</sup>, Cu<sup>2+</sup>, Cd<sup>2+</sup>, Fe<sup>3+</sup>, Ni<sup>2+</sup>, Mn<sup>2+</sup>, Mg<sup>2+</sup>, Al<sup>3+</sup>, Cr<sup>3+</sup>, K<sup>+</sup>, NH<sub>4</sub><sup>+</sup></p> <p>Anions : (from amongst) CO<sub>3</sub><sup>2-</sup>, SO<sub>3</sub><sup>2-</sup>, S<sup>2-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup></p> <p>(Scheme of analysis should avoid use of sulphide ion in any form for precipitation /separation of cations).</p>	
<b>PRACTICAL COURSE ORGANIC CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>Crystallization Acetamide / salicylic acid from hot water using fluted filter paper.</li> <li>Characterization organic compounds containing only C, H, (O) elements (no element test):</li> </ol> <p>Compounds belonging to the following classes; carboxylic acid, phenol, aldehyde/ ketone, ester, alcohol, hydrocarbon. (Minimum 7 compounds)</p>	

Course Code	Credits
USCH201	2 Credits (45 Lectures)
<p><b>Unit I :</b></p> <p><b>1.1 GASEOUS STATE (7L)</b>  Ideal Gas laws, Kinetic theory of gases, Maxwell-Boltzmann's distribution of velocities (qualitative discussion), Ideal gases, real gases, compressibility factor, Boyle's temperature. (Numericals expected)</p> <p>Deviation from ideal gas laws, reasons for deviation from ideal gas laws, van der Waals equation of state, Joule-Thomson effect –qualitative discussion and experimentation, Inversion temperature.</p> <p><b>1.2 NUCLEAR CHEMISTRY-I (8L)</b>  Natural Radioactivity – Introduction, Types of radiation (<math>\alpha</math>, <math>\beta</math>, <math>\gamma</math>) &amp; their properties. Group Displacement Law, Mechanism of <math>\beta</math> – ray emission.</p> <p>Isobars, Isotopes &amp; Isotones.</p> <p>Radioactive decay, Derivation for decay constant and half life period (Numericals expected).</p>	<p><b>15</b> <b>Lectures</b></p>
<p><b>Unit II:</b></p> <p><b>2.1 BUFFERS (4L)</b>– Introduction, Types of buffers, Derivation of Henderson equation for acidic and Basic buffers, Buffer action, Buffer capacity. (Numericals expected.)</p> <p><b>2.2 OXIDATION&amp;REDUCTION (4L)</b>– Oxidising and Reducing agents, Oxidation number, Rules to assign Oxidation numbers with examples ions like oxalate, permanganate and dichromate. Balancing redox reactions by ion electron method</p> <p><b>2.3 Introduction to Gravimetric Analysis (7L)</b></p> <p><b>2.3.1</b> Solubility product and Precipitation.</p> <p><b>2.3.2</b> Factors affecting solubility of precipitate.</p> <p><b>2.3.3</b> Conditions of precipitation, nucleation, particle size, crystal growth, colloidal state, ageing of precipitate/digestion of precipitate.</p> <p><b>2.3.4</b> Impurities in the analytical precipitate- Co-precipitation and Post</p>	<p><b>15</b> <b>Lectures</b></p>

precipitation. Washing, drying and ignition of precipitate.	
<p><b>Unit III:</b></p> <p><b>3.1 Titrimetric Analysis –I</b></p> <p><b>3.1.1</b> Terms – Titration ,Titrant , titrand, End point, Equivalence point, Titration Error ,Indicator</p> <p><b>3.1.2</b> Primary and Secondary standards- characteristics and examples</p> <p><b>3.1.3</b> Types of Titration –Acid –Base, Redox. Precipitation, Complexometric titration.</p> <p><b>3.1.4</b> Acid – base titration.-Strong Acid Vs Strong Base -Theoretical aspects of titration curve and end point evaluation.</p> <p>Theory of Acid –Base Indicators, Choice and suitability of Indicators .</p>	<p><b>15</b> <b>Lectures</b></p>

Course Code	Credits
USCH202	2 Credits (45 Lectures)
<p><b>Unit I:</b></p> <p><b>1.1 Comparative Chemistry of Main Group Elements:</b> Metallic and Non-Metallic Nature, Oxidation States, Electronegativity, Anomalous behavior of Second Period elements, allotropy. Catenation, Diagonal relationship. (5 L)</p> <p><b>1.2 Comparative Chemistry of Carbides , Nitrides , Oxides and hydroxides of Group-I and II elements.</b> Some important compounds: a) <math>\text{Na}_2\text{CO}_3</math>; b) <math>\text{NaOH}</math>; c) <math>\text{NaCl}</math>; d) <math>\text{NaHCO}_3</math>; e) <math>\text{CaO}</math>; <math>\text{CaCO}_3</math> (5L)</p> <p><b>1.3 Oxides of carbon ,Oxides and Oxyacids of Sulfur and Nitrogen with respect to Environmental aspects. (5L)</b></p>	<b>15 Lectures</b>
<p><b>Unit II:</b></p> <p><b>2.1 Acid-Base Theories</b> Arrhenius ; Lowry-Bronsted ;Lewis ; Solvent-Solute;Lux-Flood;Hard and Soft Acids and Bases-HSAB( with respect to toxicity of inorganic species);Usanovich Definition. (8L)</p> <p><b>2.2 Stereochemistry of organic Compounds (7L)</b></p> <p>2.2.1 Isomerism – Types of isomerism: constitutional isomerism (chain, position and functional) and stereoisomerism.</p> <p>2.2.2. Chirality: Configuration, asymmetric carbon atom, stereogenic/ chiral centers, chirality, representation of configuration by “flying wedge formula” and projection formulae – Fischer, Newman and Sawhorse. The interconversion of the formulae.</p> <p>2.2.3. Stereochemistry of carbon compounds with one and two similar and dissimilar asymmetric carbon atoms; enantiomers, diastereomers, and racemic mixtures cis-trans, threo, erythro and meso isomers.</p> <p>2.2.4. Diastereomerism (cis-trans isomerism) in alkenes and cycloalkanes (3 and 4 membered ring)</p> <p>2.2.5. Conformation: Conformations of ethane. Difference between configuration and conformation.</p>	<b>15 Lectures</b>

**Mechanism of organic reactions:**

3.1 Classification of organic reactions based on mechanism. (8L)

3.1.1 Substitution: Nucleophilic substitution in alkyl halides ( $S_N1$  and  $S_N2$ ), electrophilic substitution in benzene (Friedel Crafts alkylation), Radical substitution (Chlorination and bromination of methane and propane).

3.1.2 Addition: Electrophilic addition (Markovnikov addition of HX to alkenes); Radical addition (AntiMarkovnikov addition of HBr to alkenes in presence of peroxide); Nucleophilic addition to aldehydes and ketones (addition of HCN and aldol addition).

3.1.3 Elimination: Dehydrohalogenation of alkyl halides ( $E1$  and  $E2$ ).

3.1.4 Rearrangement: Hydrolysis of neopentyl chloride.

3.1.5 Pericyclic reactions: Diels-Alder cycloaddition.

**3.2 Functional group interconversion** based on the preparations and reactions of the following classes of organic compounds: haloalkanes and alcohols. (7L)

3.2.1 Hydrocarbons

3.2.2 Alkanes: Methods of formation: Kolbe reaction, Wurtz reaction, decarboxylation of carboxylic acids; hydrogenation of alkenes and hydrolysis of Grignard reagent Reactions: Halogenation of alkanes

3.2.3 Alkenes: Methods of formation: Dehydrohalogenation of alkyl halides, Dehydration of alcohols; Reduction of alkynes

Reactions: Addition of hydrogen, halogen, HX, HX in presence of peroxide,  $H_2SO_4$ , allylic halogenation using NBS; Ozonolysis, epoxidation; hydroboration-oxidation; ; Oxidation using  $KMnO_4$  &  $OsO_4$ .

3.2.4 Alkynes: Methods of formation: Dehydrohalogenation of alkyl dihalides, alkylation of terminal alkynes.

Reactions: Addition of hydrogen, halogen, HX,  $H_2O$ , hydroboration oxidation; Hydroboration-oxidation, Ozonolysis,

3.2.5 Alkyl halides: Methods of formation: Halogenation of alkanes, Hydrohalogenation of alkenes and alkynes, Reaction of alcohols with  $SOCl_2$

and  $\text{PCl}_5$ .

Reactions:  $\text{S}_\text{N}$  reactions with hydroxide, alkoxide, cyanide, ammonia, amines, acetylide ion, silver acetate. Dehydrohalogenation, Formation and synthetic applications of Grignard reagent.

3.2.6 Alcohols: Methods of formation: Hydration of alkenes, Hydrolysis of alkyl halides, Reduction of aldehydes and ketones. Reactions: Reaction with  $\text{HX}$ ,  $\text{PX}_3$ , Dehydration, esterification, oxidation.

<b>Course Code</b>	<b>Credits</b>
<b>USCHP2</b>	<b>2 Credits</b>
<b>PRACTICAL COURSE PHYSICAL CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>1. To standardize commercial sample of NaOH using KHP and to write material safety data of the chemicals involved.</li> <li>2. To standardize commercial sample of HCl using Borax and to write material safety data of the chemicals involved.</li> <li>3. To study the reaction <math>\text{NaHSO}_3</math> and <math>\text{KMnO}_4</math> and balancing the reaction in acidic, alkaline and neutral medium.</li> <li>4. To study the kinetics of reaction between thiosulphate ion and HCl.</li> </ol>	
<b>PRACTICAL COURSE ANALYATICAL CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>1. Determination of acetic acid in Vinegar by titrimetric method.</li> <li>2. Determination of strength of HCl in Commercial sample.</li> <li>3. Determination of the amount of Mg(II) present in the given solution complexometrically</li> <li>4. Determination of the amount of Fe(II) present in the given solution titrimetrically</li> </ol>	
<b>PRACTICAL COURSE INORGANIC CHEMISTRY</b>	
<ol style="list-style-type: none"> <li>1. Inorganic Preparations <ol style="list-style-type: none"> <li>i. Copper Sulfate from Copper(II) Oxide;</li> <li>ii. Barium Chromate from Barium Chloride;</li> </ol> </li> <li>2. Volumetric Analysis:- (Any Two) <ol style="list-style-type: none"> <li>i. To study the Transfer of electrons (Titration of sodium thiosulfate with potassium dichromate);</li> <li>ii. Determination of the strength of sodium carbonate and sodium bicarbonate by titration with standard acid solution using phenolphthalein and methyl orange as indicators;</li> <li>iii. Determination of the volume strength of hydrogen peroxide solution, by titration with standardized potassium permanganate solution.</li> </ol> </li> </ol>	



## **PRACTICAL COURSE ORGANIC CHEMISTRY**

Characterization of organic compounds containing C, H, (O), N, S, halogen elements. (Element tests to be done)

Compounds belonging to the following classes: amine, amide, nitro compound, thioamide, haloalkane, haloarene. (Minimum 7 compounds)

## SUGGESTED REFERENCES 202

1. B.Douglas, D.H. McDaniel and J.J.Alexander, Concepts and Models of Inorganic Chemistry, 2<sup>nd</sup> edition, John Wiley & Sons, (1983).
2. Gary Wulfsberg, Inorganic Chemistry ; Viva Books PA Ltd., New Delhi; (2002).
3. W.W.Porterfield,*Inorganic Chemistry-An Unified Approach*, Academic press(1993);
4. D.F.Shriver, P.W.Atkins and C.H. Langford, Inorganic Chemistry, 3<sup>rd</sup> edition Oxford University Press, (1999).
5. Asim K.Das, *Fundamental Concepts of Inorganic Chemistry*,(Volumes-I,II and III)CBS Pub.(2000)
6. N.N.Greenwood and A.Earnshaw, Chemistry of Elements, Pergamon, (1984).
7. P. K. Dutta, 'General and Inorganic Chemistry',Levant Books,15<sup>th</sup> Edition,(2003).

## SUGGESTED REFERENCE 101 & 201

1. Fundamental of Analytical Chemistry-Skoog D.A. and West D.M. Saunders, College Publication
2. Introduction to Instrumental Analysis, R. D. Brown, McGraw Hill.
3. Instrumental Methods of Analysis, H. H. Willard, L. L. Meritt and J. A. Dean, Affiliated East-West Press.
4. Quality in the Analytical Chemistry laboratory –Neil T.Crosby,Florence Elizabeth Prichard, Ernest.J Newman – John Wiley&Sons Ltd
5. Principles and Practice of Analytical Chemistry-Fifield F.W. and Kealey D, Black well Science
6. Analytical Chemistry, Christain, WSE / Wiley
7. Basic concepts of Analytical Chemistry, S.M.Khopkar, New Age International(P) Ltd
8. Quantitative Analysis, R.A Day &A.L Underwood, Prentice Hall Publication
9. Chemical Analysis in the laboratory –A Basic guide by Irene Muller-Harvey ,Richard .M.Baker ,Royal Society of Chemistry
10. Textbook of Quantitative Inorganic Analysis-Vogel A.I.

## **SUGGESTED REFERENCE 102**

1. J. Barrett and A. Malati, 'Fundamentals of Inorganic Chemistry', East-West Press Edition (2006)
2. C.M. Day and Joel Selbin, 'Theoretical Inorganic Chemistry', Affiliated East West Press Pvt.Ltd., (1985).
3. J.D.Lee, Concise 'Inorganic Chemistry', 5<sup>th</sup> ed., Blackwell Science Ltd., (2005).
4. James E.Huheey, 'Inorganic Chemistry', 3<sup>rd</sup> edition, Harper & Row, Publishers, Asia, Pte Ltd., (1983).
5. R. J. Gillespie and I. Hargittai, The VSEPR Model of Molecular Geometry, Dover Publication, (2012).
6. J. Barrett, 'Inorganic Chemistry in Aqueous Solutions'; The Royal Society of Chemistry (2003).
7. T. Moeller and R. O'Connor, 'Ions in Aqueous Systems'; McGraw-Hill Book Company, (1972).

## **SUGGESTED REGERENCE 102 & 202**

1. Organic Chemistry: S.H.Pine  
McGraw Hill. Kogakusha Ltd.
2. Organic Chemistry : John McMurry  
5th Ed.Cornell University
3. Advance Organic Chemistry : Jerry March  
Wiley Eastern Ltd.
4. Aguide to IUPAC Nomenclature of Organic Compounds : Richer  
Interscience Publications
5. Organic Chemistry : T.W.G.Solomons, C.B.Fryhle, 2000  
John Wiley and Sons
6. Organic Chemistry vol 1, by V.K. Ahluwalia, Ane books pvt .Ltd

## **SUGGESTED REGERENCE 102 & 202**

1. Organic Chemistry : T.W.G.Solomons, C.B.Fryhle, 2000  
John Wiley and Sons
2. Organic Chemistry : Morrison and Boyd  
Allyn & Bacon Inc.
3. Organic Chemistry : Francis A. Carey, 1996  
3<sup>rd</sup> Ed. McGraw Hill
4. Fundamentals of Organic Chemistry : G.Mare Loudon, 2002  
4<sup>th</sup> Ed.
5. Reaction Mechanism : Peter Sykes, 1999  
Orient Longman
6. Organic Chemistry – Seyhan N.Ege, 1984.  
D.C.Heath & Co.
7. Organic Reactions With Mechanism by S.P.Bhutani ,Ane book Pvt.Ltd.



**UNIVERSITY OF MUMBAI**



**Program: S.Y.B. Sc.**

**Course: Zoology**

(Credit Based Semester and Grading System  
with effect from the academic year 2016–2017)

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Ms Pranjali Tripathi	Student
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**Syllabus for**  
**S.Y.B.Sc.**  
**Course – ZOOLOGY**  
**To be implemented from Academic year 2016-17**  
**SEMESTER - III**

<b>COURSE CODE</b>	<b>UNIT</b>	<b>TOPIC</b>	<b>CREDITS</b>	<b>LECTURES/ WEEK</b>
<b>USZO301</b>	I	Fundamentals of Genetics,	2	1
	II	Chromosomes and Heredity,		1
	III	Nucleic acids		1
<b>USZO302</b>	I	Study of Nutrition and Excretion	2	1
	II	Study Respiration and circulation,		1
	III	Control and coordination, Locomotion and Reproduction		1
<b>USZO303</b>	I	Ethology	2	1
	II	Parasitology		1
	III	Economic Zoology		1
<b>USZOP3</b>	Practical based on all three courses		03	<b>9</b>

**SEMESTER - IV**

<b>COURSE CODE</b>	<b>UNIT</b>	<b>TOPIC</b>	<b>CREDITS</b>	<b>LECTURES/ WEEK</b>
<b>USZO401</b>	I	Origin and evolution of Life,	2	1
	II	Population genetics and evolution,		1
	III	Scientific Attitude methodology , writing and ethics		1
<b>USZO402</b>	I	Cell Biology,	2	1
	II	Endo membrane System		1
	III	Biomolecules		1
<b>USZO403</b>	I	Comparative Embryology,	2	1
	II	Aspects of Human Reproduction,		1
	III	Pollution and its effect on organisms		1



<b>USZOP4</b>	Practical based on all three courses	03	<b>9</b>
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**Syllabus for  
S.Y.B.Sc  
Course – ZOOLOGY**

1. Syllabus Semester III & IV ( Theory and Practical)
2. References and Additional Reading
3. Scheme of Examination and Paper Pattern (Theory and Practical )
4. Model Question bank

<b>S.Y.B.Sc. ZOOLOGY UNIT WISE DISTRIBUTION</b>					
<b>Semester III</b>			<b>Semester IV</b>		
<b>Course 5</b>	<b>Course 6</b>	<b>Course 7</b>	<b>Course 8</b>	<b>Course 9</b>	<b>Course 10</b>
<b>Unit 1</b> Fundamentals of Genetics	<b>Unit 1</b> Study of Nutrition & Excretion	<b>Unit 1</b> Ethology	<b>Unit 1</b> Origin & Evolution of Life	<b>Unit 1</b> Cell Biology	<b>Unit 1</b> Comparative Embryology
<b>Unit 2</b> Chromosome & Heredity	<b>Unit 2</b> Study of Respiration & circulation	<b>Unit 2</b> Parasitology	<b>Unit 2</b> Population Genetics & Evolution	<b>Unit 2</b> Endomembrane System	<b>Unit 3</b> Aspects of human Reproduction
<b>Unit 3</b> Nucleic Acids	<b>Unit 3</b> Control and Coordination Locomotion & Reproduction	<b>Unit 3</b> Economic Zoology	<b>Unit 3</b> Scientific Attitude, Methodology, Writing & Ethics	<b>Unit 3</b> Biomolecules	<b>Unit 3</b> Pollution & Effects on Animals
<b>Practical (USZO P3)</b>	<b>Practical (USZO P3)</b>	<b>Practical (USZO P3)</b>	<b>Practical (USZO P4)</b>	<b>Practical (USZO P4)</b>	<b>Practical (USZO P4)</b>

## S.Y.B.Sc SYLLABUS DRAFT

## SEMESTER III

Sr. No	USZO301 COURSE-5	No of lect allotted	Learning pleasure
	<b>Fundamentals of Genetics, Chromosomes and Heredity, Nucleic acids</b>		
	<b>Unit 1: Fundamentals of Genetics</b>	<b>15L</b>	<b>25hrs</b>
	<b>Objectives :</b> <ul style="list-style-type: none"> <li>➤ To Introduce basic terms of genetics</li> <li>➤ To study Mendelian principles of inheritance and other forms pattern of inheritance</li> </ul>		
	<b>Desired outcomes :</b> <ul style="list-style-type: none"> <li>➤ Understand and apply the principles of inheritance.</li> <li>➤ Understand the concept of multiple alleles, linkage and crossing over.</li> </ul>		
<b>1.1</b>	<b>Introduction to genetics</b> <ul style="list-style-type: none"> <li>➤ Definition, scope and importance of genetics.</li> <li>➤ Classical and Modern concept of Gene (Cistron, muton, recon).</li> <li>➤ Brief explanation of the following terms: Allele, wild type and mutant alleles, locus, dominant and recessive traits, homozygous and heterozygous, genotype and phenotype, genome.</li> </ul>	<b>2L</b>	<b>2hrs</b>
<b>1.2</b>	<b>Mendelian Genetics</b> <ul style="list-style-type: none"> <li>➤ Mendelian Genetics: Monohybrid cross, Dihybrid cross, test cross, back cross, Mendel's laws of Inheritance, Mendelian traits in man.</li> <li>➤ Exceptions to Mendelian Inheritance: Incomplete dominance, Co-dominance, Lethal alleles, Epistasis - Recessive, Double recessive, dominant and double dominant.</li> <li>➤ Chromosome theory of inheritance.</li> <li>➤ Pedigree analysis-Autosomal dominant and autosomal recessive, X-linked dominant, and X-linked recessive</li> </ul>	<b>8L</b>	<b>12hrs</b>
<b>1.3</b>	<b>Multiple Alleles and Multiple Genes</b> <ul style="list-style-type: none"> <li>➤ Concept of multiple alleles, Coat colour in rabbit, ABO and Rh blood group systems</li> <li>➤ Polygenic inheritance with reference to skin colour and eye colour in man.</li> <li>➤ Concept of pleiotropy.</li> </ul>	<b>3L</b>	<b>06hrs</b>

1.4	<b>Linkage and Crossing Over</b> ➤ Linkage and crossing over, types of crossing over, cytological basis of crossing over.	2L	05hrs
<b>Unit: 2: Chromosomes and Heredity</b>		15 L	26hrs
	<b>Learning objectives:</b> ➤ To familiarize the learners with the structure, types and classification of chromosomes. ➤ To introduce the concept of sex determination and its types, sex influenced and sex limited genes.		
	<b>Desired Outcomes:</b> ➤ Learners would understand the structure and types of chromosomes. ➤ Learners would understand mechanisms of sex determination. ➤ Learners would be able to correlate the disorders linked to a particular sex chromosome.		
2.1	<b>Chromosomes</b> ➤ Types of chromosomes–Autosomes and Sex chromosomes ➤ Chromosome structure - Heterochromatin, Euchromatin ➤ Classification based on the position of centromere ➤ Endomitosis, Giant chromosomes- Polytene and Lamp brush chromosomes and significance of Balbiani rings.	4L	8hrs
2.2	<b>Sex- determination</b> ➤ Chromosomal Mechanisms: XX-XO, XX-XY, ZZ-ZW. ➤ Sex determination in honey bees- Haplodiploidy, ➤ Sex determination in <i>Drosophila</i> -Genic balance theory, intersex, gynandromorphs. ➤ Parthenogenesis. ➤ Hormonal influence on sex determination-Freemartin and sex reversal. ➤ Role of environmental factors- Bonellia and Crocodile ➤ Barr bodies and Lyon hypothesis	7L	10hrs
2.3	<b>Sex linked, sex influenced and sex limited inheritance.</b> ➤ X-Linked: Colourblindness, Haemophilia ➤ Y-linked: Hypertrichosis ➤ Sex-influenced genes ➤ Sex limited genes	4L	8hrs
<b>Unit: 3 Nucleic acids</b>		15 L	30hrs
	<b>Objectives:</b> ➤ To introduce to the learners the classical experiments proving DNA as the genetic material. ➤ To make the learner understand the structure of nucleic acids and the concept of central dogma of molecular biology. ➤ To familiarize the learner with the concept of gene regulation.		
	<b>Desired Outcomes:</b> ➤ Learner would understand the importance of nucleic acids as genetic material.		

	➤ <i>The learners would understand and appreciate the regulation of gene expressions.</i>		
<b>3.1</b>	<b>Genetic material</b> <ul style="list-style-type: none"> <li>➤ Griffith's transformation experiments, Avery-Macleod and McCarty, Hershey Chase experiment of Bacteriophage infection</li> <li>➤ Chemical composition and structure of nucleic acids.</li> <li>➤ Double helix nature of DNA, Solenoid model of DNA.</li> <li>➤ Types of DNA – A, B, Z &amp; H forms.</li> <li>➤ DNA in Prokaryotes -chromosomal and plasmid.</li> <li>➤ Extra nuclear DNA -mitochondria and chloroplast.</li> <li>➤ RNA as a genetic material in viruses.</li> <li>➤ Types of RNA: Structure and function.</li> </ul>	<b>7L</b>	<b>14hrs</b>
<b>3.2</b>	<b>Flow of genetic information in a Eukaryotic cell</b> <ul style="list-style-type: none"> <li>➤ DNA Replication</li> <li>➤ Transcription of mRNA</li> <li>➤ Translation</li> <li>➤ Genetic code</li> </ul>	<b>5L</b>	<b>08hrs</b>
<b>3.3</b>	<b>Gene Expressions and regulation</b> <ul style="list-style-type: none"> <li>➤ One gene-one enzyme hypothesis /one polypeptide hypothesis</li> <li>➤ Concept of operon</li> <li>➤ Lac operon</li> </ul>	<b>3L</b>	<b>08hrs</b>

<b>Sr. No</b>	<b>USZO302 COURSE-6</b>	<b>No of lect allotted</b>	<b>Learning pleasure</b>
	<b>Study of Nutrition and Excretion , Respiration and circulation, Control and coordination, Locomotion and Reproduction</b>		
	<b>Unit: 1 Study of Nutrition and Excretion</b>	<b>15L</b>	<b>23hrs</b>
	<b>Objective :</b> <ul style="list-style-type: none"> <li>➤ <i>To introduce the concepts of physiology of nutrition, excretion and osmoregulation.</i></li> <li>➤ <i>To expose the learners to various nutritional apparatus, excretory and osmoregulatory structures in different classes of organisms.</i></li> </ul>		
	<b>Desired Outcome :</b> <ul style="list-style-type: none"> <li>➤ <i>Learners would understand the increasing complexity of nutritional, excretory and osmoregulatory physiology in evolutionary hierarchy.</i></li> <li>➤ <i>Learners would be able to correlate the habit and habitat with nutritional, excretory and osmoregulatory structures.</i></li> </ul>		
<b>1.1</b>	➤ Comparative study of Nutritional Apparatus (structure and function): Amoeba, Hydra, Earthworm, Cockroach, Bivalve,	<b>5L</b>	<b>06hrs</b>

	Amphioxus, Pigeon, Ruminants.		
1.2	➤ Physiology of digestion in man	2L	04hrs
1.3	➤ Comparative study of Excretory and Osmoregulatory structures and function a. Amoeba -contractile vacuoles b. Planaria -Flame cells c. Earthworm -Nephridia d. Cockroach-Malphigian tubules and green gland e. Bivalve -Organ of Bojanus	5L	08hrs
1.4	➤ Categorization of animals based on principle nitrogenous excretory products	1L	01hrs
1.5	➤ Structure of kidney, Uriniferous tubule and physiology of urine formation in man.	2L	04hrs
<b>Unit: 2 Study of Respiration and circulation</b>		<b>15L</b>	<b>27hrs</b>
	<b>Objective :</b> ➤ To introduce the concepts of physiology of respiration and circulation ➤ To expose the learners to various respiratory and circulatory structures in different classes of organisms.		
	<b>Desired Outcome:</b> ➤ Learners would understand the increasing complexity of respiratory and circulatory physiology in evolutionary hierarchy. ➤ Learners would be able to correlate the habit and habitat with respiratory and circulatory structures.		
2.1	➤ Comparative study of Respiratory organs (structure and function) Earthworm, Spider, Rohu, Frog and Pigeon.	3L	06hrs
2.2	➤ Accessory respiratory structures: Anabas /Clarius	1L	02hrs
2.3	➤ Structure of lungs and physiology of respiration in man	2L	04hrs
2.4	➤ Comparative study of circulation: Open and closed - single and double .	1L	02hrs
2.5	➤ Types of circulating fluids- Water, coelomic fluid, haemolymph, lymph and blood.	2L	02hrs
2.6	➤ Comparative study of Hearts (Structure and function) Earthworm, Cockroach, Shark, Frog, Crocodile and Pigeon.	4L	07hrs
2.7	➤ Structure and mechanism of working of heart in man	2L	04hrs
<b>Unit: 3 Control and coordination, Locomotion and Reproduction</b>		<b>15L</b>	<b>25hrs</b>
	<b>Objective :</b> ➤ To introduce the concepts of physiology of control and coordination and locomotion and reproduction		

	➤ <i>To expose the learners to various locomotory and reproductive structures in different classes of organisms</i>		
	<b>Desired Outcome:</b> ➤ <i>Learners would understand the process of control and coordination by nervous and endocrine regulation.</i> ➤ <i>Learners would be fascinated by various locomotory structures found in the animal kingdom.</i> ➤ <i>Learners would be acquainted with various reproductive strategies present in animals.</i>		
<b>3.1</b>	<b>Control and coordination</b> ➤ Irritability –Paramoecium , Nerve net in Hydra, Nerve ring and nerve cord in earthworm ➤ Types of neurons on the basis of structure and function ➤ Conduction of nerve impulse: Resting potential , action potential and refractory period ➤ Synaptic transmission ➤ Endocrine regulation: Hormones as chemical messengers, feedback mechanisms	<b>5L</b>	<b>08hrs</b>
<b>3.2</b>	<b>Movement and Locomotion</b> ➤ Locomotory organs -structures and functions a. Pseudopodia in Amoeba (sol gel theory), Cilia in Paramecium b. Wings and legs in Cockroach c. Tube feet in Starfish d. Fins of fish	<b>4L</b>	<b>08hrs</b>
<b>3.3</b>	➤ Structure of Striated muscle fibre in human and Sliding filament theory	<b>2L</b>	<b>02 hrs</b>
<b>3.4</b>	<b>Reproduction</b> a. Asexual Reproduction- Fission, fragmentation, gemmule formation, budding b. Sexual reproduction i. Gametogenesis ii. Structure of male and female gametes in human iii. Types of fertilization iv. Oviparity, viviparity, ovo-viviparity	<b>4L</b>	<b>07hrs</b>
<b>USZO 303 COURSE-7</b>			
<b>Ethology , Parasitology, Economic Zoology</b>		<b>15L</b>	<b>26hrs</b>
<b>Unit: 1 Ethology</b>			
	<b>Objective:</b> ➤ <i>To equip learners with a sound knowledge of how animals interact with one another and their environment.</i> ➤ <i>To enable the learners to understand different behavioural patterns.</i>		
	<b>Desired Outcome:</b>		

	<ul style="list-style-type: none"> <li>➤ Learners would gain an insight into different types of animal behaviour and their role in biological adaptations.</li> <li>➤ Learners would be sensitized to the feelings instrumental in social behavior.</li> </ul>		
<b>1.1</b>	<b>Introduction to Ethology</b> <ul style="list-style-type: none"> <li>➤ Definition, History and Scope of Ethology</li> <li>➤ Animal behaviour - Innate and Learned behaviour</li> <li>➤ Types of learning -Habituation, Imprinting and types of imprinting -filial and sexual, Classical conditioning, Instrumental learning and insight learning.</li> </ul>	<b>4L</b>	<b>06hrs</b>
<b>1.2</b>	<b>Aspects of animal behaviour</b> <ul style="list-style-type: none"> <li>➤ Communication in Bees and Ants</li> <li>➤ Mimicry and colouration</li> <li>➤ Role of hormones and pheromones in sexual behaviour</li> <li>➤ Displacement activities, Ritualization</li> <li>➤ Migration in fish, schooling behaviour</li> <li>➤ Habitat selection, territorial behaviour, food selection and foraging behaviour in African ungulates</li> </ul>	<b>6L</b>	<b>12hrs</b>
<b>1.3</b>	<b>Social behaviour</b> <ul style="list-style-type: none"> <li>➤ Social behaviour in primates -Hanuman langur</li> <li>➤ Elements of Socio-biology: Selfishness, cooperation, altruism, kinship and inclusive fitness</li> </ul>	<b>5L</b>	<b>08hrs</b>
	<b>Unit: 2 Parasitology</b>	<b>15L</b>	<b>27hrs</b>
	<b>Objective:</b> <ul style="list-style-type: none"> <li>➤ To acquaint learners with the concepts of parasitism, their relationship with environment.</li> <li>➤ To make learners aware about the modes of transmission of parasites.</li> </ul>		
	<b>Desired Outcome:</b> <ul style="list-style-type: none"> <li>➤ Learners would understand the general epidemiological aspects of parasites that affect humans and apply simple preventive measures for the same.</li> <li>➤ Learners would comprehend the life cycle of specific parasites, the symptoms of the disease and its treatment.</li> </ul>		
<b>2.1</b>	<b>Introduction to Parasitology and types of parasites</b> <ul style="list-style-type: none"> <li>➤ Definitions: parasitism, host, parasite, vector-biological and mechanical</li> <li>➤ <b>Types of parasites-</b> Ectoparasites, Endoparasite and their subtypes</li> <li>➤ Parasitic adaptations in Ectoparasites and Endoparasites</li> <li>➤ Types of hosts: intermediate and definitive, reservoir</li> </ul>	<b>2L</b>	<b>06hrs</b>
<b>2.2</b>	<b>Host-parasite relationship-Host specificity</b> <ul style="list-style-type: none"> <li>➤ Definition, structural specificity, physiological specificity and ecological specificity.</li> </ul>	<b>2L</b>	<b>06hrs</b>



2.3	<b>Life cycle, pathogenicity, control measures and treatment</b> ➤ <i>Entamoeba histolytica</i> , <i>Fasciola hepatica</i> , <i>Taenia solium</i> , <i>Wuchereria bancrofti</i>	5L	06hrs
2.4	<b>Morphology, life cycle, pathogenicity, control measures and treatment</b> ➤ Head louse ( <i>Pediculus humanus capitis</i> ), Mite ( <i>Sarcoptes scabiei</i> ), Bed bug ( <i>Cimex lectularis</i> )	2L	06hrs
2.5	<b>Parasitological significance</b> ➤ Zoonosis- Bird flu, Anthrax, Rabies and Toxoplasmosis	4L	03hrs
	<b>Unit 3 Economic Zoology</b>	15L	24hrs
	<b>Objective:</b> ➤ To disseminate information on economic aspects of zoology like apiculture, vermiculture, dairy science. ➤ To encourage young learners for self employment.		
	<b>Desired Outcome:</b> ➤ Learners would gain knowledge on animals useful to mankind and the means to make the most of it. ➤ Learners would learn the modern techniques in animal husbandry. ➤ Learners would be pursuing entrepreneurship as careers		
3.1	<b>APICULTURE</b>	5L	08hrs
3.1.1	<b>Methods of bee keeping and management</b> ➤ An introduction to different species of honey bees used in apiculture. ➤ Selection of flora and bees for apiculture. ➤ Advantages and disadvantages of traditional and modern methods of apiculture. ➤ Pests and Bee enemies- Wax moth, wasp, black ants, bee eaters , king crow and disease control ➤ Bee keeping industry- Present status and recent efforts to improve and boost the industry		
3.1.2	<b>Economic importance</b> ➤ Honey- Production, Chemical composition and economic importance ➤ Bees wax- Economic importance. ➤ Role of honey bees in pollination.		
3.2	<b>VERMICULTURE</b>	4L	08hrs

3.2.1	<b>Rearing methods, management and economic importance</b> <ul style="list-style-type: none"> <li>➤ An introduction to different species of earthworms used in vermiculture.</li> <li>➤ Methods of vermiculture.</li> <li>➤ Maintenance and harvesting</li> <li>➤ Economic importance: advantages of vermiculture, demands for worms; market for vermicompost and entrepreneurship.</li> </ul>		
3.3	<b>DAIRY SCIENCE</b>	<b>6L</b>	<b>08hrs</b>
3.3.1	<b>Dairy development in India</b> <ul style="list-style-type: none"> <li>➤ Role of dairy development in rural economy, employment opportunities</li> </ul>		
3.3.2	<b>Dairy Processing</b> <ul style="list-style-type: none"> <li>➤ Filtration, cooling, chilling, clarification, pasteurization, freezing</li> </ul>		
3.3.3	<b>Milk and milk products</b> <ul style="list-style-type: none"> <li>➤ Composition of milk</li> <li>➤ Types of milk: Recombined milk, Soft curd milk, Skimmed and toned milk, Artificial milk.</li> <li>➤ Milk products</li> </ul>		

<b>SEMESTER III</b>	
<b>Practical USZOP3 (Course V)</b>	
<b>1</b>	Extraction and detection of DNA
<b>2</b>	Extraction and detection of RNA.
<b>3</b>	Mounting of Barr bodies.
<b>4</b>	Study of polytene chromosome.
<b>5</b>	Study of mitosis- temporary squash preparation of Onion root tip
<b>6</b>	Detection of blood groups and Rh factor.
<b>7</b>	Problems in genetics a. Monohybrid/ Dihybrid cross b. X- linked inheritance c. Multiple alleles
<b>8</b>	Chromosome morphology: Metaphase spreadsheet (photograph to be provided)
<b>9</b>	Pedigree analysis
<b>10</b>	Problems on molecular biology
<b>Practical USZOP3 (Course VI)</b>	
<b>1</b>	Urine analysis—Normal and abnormal constituents
<b>2</b>	Detection of ammonia in water excreted by fish
<b>3</b>	Detection of uric acid from excreta of Birds
<b>4</b>	Study of striated and non- striated muscle fibre

5	Study of nutritional Apparatus (Amoeba, Hydra, Earthworm, Pigeon, Ruminant stomach)
6	Study of respiratory structures: <ol style="list-style-type: none"> <li>Gills of Bony fish and Cartilaginous fish.</li> <li>Lungs of Frog</li> <li>Lungs of Mammal.</li> <li>Accessory respiratory structure in Anabas (Labyrinthine organ )</li> <li>Air sacs of Pigeon.</li> </ol>
7	Study of locomotory organs ( <i>Amoeba</i> , <i>Unio</i> , Cockroach, Starfish, Fish, and Birds)
8	Study of hearts (Cockroach, Shark, Frog, <i>Calotes</i> , Crocodile, Mammal)
9	Study of permanent slides on topic of Reproduction <ol style="list-style-type: none"> <li>Sponge gemmules</li> <li>Hydra budding</li> <li>T.S. of mammalian testis</li> <li>T.S. of mammalian ovary</li> </ol>
<b>Practical USZOP3 (Course VII)</b>	
1	Extraction of Casein from Milk and its qualitative estimation
2	Preparation of paneer from given milk sample
3	Measurement of density of milk using different samples by Lactometer
4	Study of Honey Bee : <ol style="list-style-type: none"> <li>Life Cycle of Honey Bee and Bee Hive</li> <li>Mouthparts of Honey Bee</li> <li>Legs of Honey Bee</li> <li>Sting Apparatus of Honey Bee</li> </ol>
5	Study of ethological aspects: <ol style="list-style-type: none"> <li>Warning Colouration</li> <li>Instincts</li> <li>Imprinting</li> <li>Communication in animals: Chemical signals and sound signals</li> <li>Displacement activities in animals: Courtship and mating behavior in animals and ritualization</li> </ol>
6	Study of Protozoan parasites: <ol style="list-style-type: none"> <li><i>Trypanosoma gambiense</i></li> <li><i>Giardia intestinalis</i></li> </ol>
7	Study of Helminth parasites: <ol style="list-style-type: none"> <li><i>Ancylostoma duodenale</i></li> <li><i>Dracunculus medenensis</i></li> </ol>
8	Parasitic adaptations: Scolex and mature proglottid of Tapeworm
9	Study of Ectoparasites: <ol style="list-style-type: none"> <li>Leech</li> <li>Tick</li> <li>Mite</li> </ol>

<b>10</b>	Project- Suggested topics on economic zoology (eg Apiculture, sericulture/ lac culture / vermicompost Technique / Construction of artificial beehives /Animal husbandry/ aquaculture etc)
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**Note -The practicals may be conducted by using specimens authorised by the wildlife and such other regulating authorities though it is strongly recommended that the same should be taught by using photographs/audio-visual aids/ simulations / models, etc. as recommended by the UGC and as envisaged in the regulations of the relevant monitoring bodies. No new specimens, however, shall be procured for the purpose of conducting practicals mentioned here-in-above.**

**#There shall be at least one excursion/field trip.**

## **Semester –III**

### **REFERENCE BOOKS AND ADDITIONAL READING**

#### **COURSE-V (USZO301)**

1. Principles of Genetics. Gardner, E.J., Simmons, M.J and Snustad, D.P. John Wiley and Sons
2. Concepts of Genetics. Klug, W.S., Cummings M.R., Spencer, C.A. Benjamin Cummings.
3. Genetics- A Molecular Approach. Russell, P. J Benjamin Cummings.
4. Genetics: Analysis of Genes and Genomes. Daniel L., Hartl, Elizabeth W. Jones Jones & Bartlett Publishers
5. Introduction to Genetic Analysis. Griffiths, A.J.F., Wessler. S.R., Lewontin, R.C. and Carroll, S.B. W. H. Freeman and Co.
6. Cell Biology Genetics , Molecular Biology Evolution and Ecology Verma P.S. and Agrawal P.K., 9<sup>th</sup> edition, S. Chand Publication, New Delhi.
7. Principles of Genetics – Eight edition- Eldon John Gardner, Michael J. Simmons, D. Peter Snustad
8. Genetics- Weaver, Hedrick, third edition, Mc Graw Hill Education
9. Genetics A Mendelian approach Peter J.Russel, Pearson Benjamin Cummings
10. Genetics A conceptual approach, Benjamin A. Pierce, Southwestern University, W.H. Freeman and company, New York
11. Genetics, Third Edition, Monroe W. Strickberger
12. Genetics from gene to genome, third edition, Leeland H. Hartwell, Leeroy Hood, Michael 7. L. Goldberg, Ann E. Reynolds, Lee M. Silver, McGraw Hill Education

#### **COURSE-VI (USZO302)**

1. Vertebrate Zoology Volume I- Jordan and Verma , S. Chand and Co.
2. Invertebrate Zoology Volume II- Jordan and Verma , S. Chand and Co.
3. Invertebrate Zoology- Majupuria T. C., Nagin S.and Co.
4. Chordate Zoology- Dhami P. S. and Dhami J. K. , R. Chand and Co.
5. Invertebrate Zoology- Dhami P. S. and Dhami J. K., R. Chand and Co.

6. Introduction to Vertebrates- Moore Cambridge University- Low Priced Edition.
7. Zoology- Miller S. A. and Harley J. B., Tata McGraw Hill.
8. Modern Textbook of Zoology, Invertebrates, Kotpal R. L.
9. Biological Science, Taylor D.J., Stout G.W., Green N.P.O, Soper R., Cambridge University Press.

**COURSE-VII (USZO303)**

1. Animal Behaviour- David Mc Farland
2. Animal Behaviour- Mohan Arora
3. Animal Behaviour- Reena Mathur
4. An introduction to Animal Behaviour- Dawkins
5. Animal Behaviour-Agarwal
6. Animal Behaviour- Tinbergen
7. Biology of Insects- 1992 Saxena S. C. Oxford and IBH Publishing Co New Delhi. Bombay. Calcutta
8. A Text Book of Entomology- 1974 Mathur V. K. and Upadhyay K Goel Printing press, Barani.
9. Bee and Bee Keeping- Roger A. Morse, Cornell University Press London
10. Vermiculture Technology - Clive A. Edwards, Norman Q. Arancon and Rhonda Sherman
11. Parasitology- Chatterjee K.D., Chatterjee Medical Publishers.
12. Medical Parasitology- Arora
13. Textbook of Medical Parasitology-. C.K Jayaram Paniker, Jaypee Brothers.
14. A text book of Parasitology- Kochhar S.K. Dominant Pub. & Dis, New Delhi.
15. Essentials of Parasitology- Gerald and Schmidt: Universal Bookstall, New Delhi.
16. Parasitology- Sharma P.N.and Ratnu L.N., Chand S & Co.Pvt.Ltd.
17. Introduction to Parasitology- Chandler and Read John Wiley & Sons
18. Economic Zoology- Biostatistics and Animal behaviour – S.Mathur, Rastogi Publicatons.
19. Economic Zoology- Shukla G.S. & Upadhyay V.B., Rastogi Publications.
20. A handbook on Economic Zoology, S.Chand & Co.

**SCHEME OF EXAMINATION (THEORY)**

- (a) Internal assessment of twenty five (25) marks per course per semester should be conducted according to the guidelines given by University of Mumbai vide circular number UG/04 of 2014 Dated 5th June 2014 to be implemented from academic year 2015-16.
- (b) External assessment of seventy five (75) marks per course per semester should be conducted as per the following skeleton question paper pattern.
- (c) One practical examination of fifty (50) marks per course each should be conducted at the end of every semester.

**SKELETON- EXAMINATION PATTERN FOR THE ABOVE SYLLABUS**

All Questions are compulsory  
Figures to the right indicate full marks

**Time: 2.5 hours****Total marks: 75**

Q.1.	UNIT 1 Answer any four out of eight (5 marks each)	20 marks
Q.2.	UNIT 2 a. Answer any one of the two (10 marks) b. Answer any two out of the four (5 marks each)	20 marks
Q.3.	UNIT 3 Answer any two out of four (10 marks each)	20 marks
Q.4.	a. Unit 1 - (One note of five marks OR objective type questions) b. Unit 2 - (One note of five marks OR objective type questions) c. Unit 3- (One note of five marks OR objective type questions)	15 marks

\*For Question 4 it is recommended to have objective questions such as –

- |                       |                                |
|-----------------------|--------------------------------|
| (a) Match the column  | (b) MCQ                        |
| (c) Give one word for | (d) True and False             |
| (e) Define the term   | (f) Answer in one sentence etc |

**MODEL QUESTION BANK SEMESTER III**

**USZO301(COURSE V)**

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit :1 (10 Marks )**

1. Define genetics and explain its scope and importance.
2. Explain Mendel's laws of inheritance.
3. Describe in detail the monohybrid cross and state the Mendelian principle of inheritance derived from it. Add a note on Co-dominance.
4. Describe in detail dihybrid cross and state the Mendelian principles of inheritance derived from it.
5. Discuss in brief inheritance of Mendelian phenotypic traits in humans.
6. Describe incomplete dominance with a suitable example.
7. Describe Co-dominance with a suitable example.
8. What is epistasis? Give a detailed account of double dominant epistasis.
9. What is epistasis? Give a detailed account of recessive epistasis.
10. What is epistasis? Give a detailed account of dominant epistasis
11. What is epistasis? Give a detailed account of double recessive epistasis.
12. Explain the pattern of inheritance of recessive and dominant lethal alleles.
13. Explain the inheritance of multiple alleles with the help of a suitable example.
14. Describe polygenic inheritance with reference to skin colour and eye colour in man.
15. Compare and contrast pleiotropy and polygenic inheritance.
16. Explain the phenomenon of linkage with respect to Morgan's Experiment. Add a note on the differences between complete and incomplete linkage.

17. Describe the pattern of inheritance of blood group and Rh factor in man.
18. Explain the cytological basis and molecular mechanisms of crossing over.
19. Explain pedigree analysis of X-linked recessive traits.

**Unit :1 (5 Marks)**

1. Describe the classical concept of gene.
2. Explain the modern concept of gene.
3. Differentiate between ( Any two):
  - (a) Genotype and phenotype of an organism
  - (b) Dominant and recessive traits
  - (c) Gene and genome
  - (d) Homozygous and heterozygous
  - (e) Monohybrid and dihybrid cross
  - (f) Incomplete Dominance and co-dominance
  - (g) Multiple alleles and polygenes
  - (h) Test cross and backcross
4. Explain how probability is used to predict the results of genetic crosses.
5. Write a note on the chromosome theory of inheritance.
6. Describe co-dominance with a suitable example.
7. Give an account of the symbols used in human Pedigree analysis
8. Characteristics of autosomal dominant traits
9. Characteristics of X-linked recessive traits
10. Characteristics of autosomal recessive traits
11. Characteristics of X-linked dominant traits
12. Intermediate lethal alleles
13. Phenylketoneuria
14. Albinism
15. Explain the inheritance of skin colour in humans.
16. Write a note on pleiotropy.

**Unit: 2 (10 Marks).**

1. Explain the structure of eukaryotic Chromosome.
2. Classify chromosomes on the basis of position of centromere.
3. Explain any two mechanisms of chromosomal basis of sex determination.
4. Explain the inheritance of colour blindness in man.
5. Explain sex determination in man/ Honey bee/ Birds/ Drosophila.

**Unit: 2 (05 Marks)**



1. Describe the terms euchromatin and heterochromatin.
2. Write a note on polytene chromosomes.
3. Write a note on Lampbrush chromosomes.
4. Write a note on salivary gland chromosome of *Drosophila*.
5. Write a note on Balbiani rings.
6. Explain endomitosis.
7. Write a note on Gynandromorphs
8. Explain the role of environment on sex determination.
9. Explain the role of hormones in sex determination.
10. Explain hypertrichosis.
11. Differentiate between sex linked and sex influenced genes.
12. Differentiate between human X and Y chromosome.
13. Differentiate between autosomes and sex chromosomes.
14. Write a note on Lyon's hypothesis.
15. What are Barr bodies? Give a scientific reason that Barr bodies are present only in women and not in men.
16. Give a scientific reason that Y chromosome is a sex determining chromosome in man.
17. Explain parthenogenesis.
18. Give scientific reason that the X linked genes affect males more than females in human beings.
19. What is centromere? Explain its role during cell division.

**Unit: 3 (10 marks)**

1. Describe Griffith transformation experiment.
2. Explain Avery, Macleod, McCarty's experiment
3. Give an account of Hershey Chase experiment of bacteriophage infection.
4. Write a note on types of DNA.
5. Explain RNA as a genetic material.
6. Describe the process of DNA replication
7. Write in detail the process of transcription
8. Discuss the process of translation
9. What is gene expression? Describe the regulation of genes with Lac operon.

**Unit 3: (5 Marks)**

**Write short notes on –**

1. Chemical composition of nucleic acid
2. A and B DNA
3. Plasmid
4. Function of mRNA

5. Function of tRNA
6. Genetic code
7. One gene one enzyme hypothesis
8. Concept of operon
9. Z DNA
10. H DNA
11. Chromosomal DNA in prokaryotes
12. Mitochondrial DNA
13. DNA in chloroplast

**MODEL QUESTION BANK SEMESTER III**

**USZO302 (COURSE VI)**

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit 1: (05 Marks)**

1. Write a note on nutrition apparatus in amoeba.
2. Describe briefly gastro-vascular cavity in hydra.
3. Explain briefly digestive system of earthworm.
4. Explain briefly digestive system of cockroach.
5. Explain briefly digestive system in bivalve.
6. Write a note on Wheel organ of Amphioxus.
7. Explain briefly digestive system of pigeon.
8. Write a note on ruminant stomach.
9. Explain briefly physiology of digestion in cockroach.
10. Write short note on digestion of proteins with respect to man.
11. Write short note on digestion of carbohydrates with respect to man
12. Write short note on digestion lipids with respect to man
13. Give a brief account of enzymes involved in the process of digestion in cockroach
14. Write short note contractile vacuoles as excretory and osmoregulatory structures in protozoa.
15. Write a note on flame cells.
16. Describe the structure of septal nephridia with the help of a neat labeled diagram.
17. Write a note on nephridia as excretory organs in earthworm.
18. Describe briefly excretory and osmoregulatory structures in arthropods.
19. Write a note on Organ of Bojanus

20. Write a note on structure of kidney in fish.
21. Write a note on structure of amphibian kidney.
22. Write a note on structure of kidney in bird.
23. Write a note on structure of mammalian kidney.
24. Write a note on Ammonotelic organisms.
25. Write a note on Ureotelic organisms.
26. Write a note on Uricotelic organisms.
27. Write a note on ultrafiltration
28. Give a brief account of process of urine formation in man.

**Unit 2: (10 Marks)**

1. Describe briefly air sacs in pigeon.
2. Describe briefly the process of internal respiration with respect to man
3. Describe briefly the process of external respiration with respect to man
4. Give a brief account of types of circulating fluids present in animals.
5. Describe briefly mechanism of working of heart.
6. Describe briefly two chambered heart in shark.
7. Describe briefly structure of heart of frog.
8. Describe briefly heart of crocodile.
9. Give a brief account of heart of man.

**Unit 2: ( 5 Mark)**

1. Write short note on cutaneous respiration.
2. Write a note on Spiracle in cockroach.
3. Write a note on book lungs in spider.
4. Explain the structure of gills of bony fish
5. Explain the structure of gills of cartilaginous fish.
6. Describe briefly lungs as respiratory organs in frog.
7. Describe briefly lungs as respiratory organs in man.
8. Explain briefly accessory respiratory structure in *Anabas*.
9. Write short note on open circulation.
10. Write short note on closed circulation.
11. Write a note on heart of cockroach
12. Write a note on heart of earthworm.

**Unit 3:(10 Marks)**

1. Describe different types of neurons on the basis of structure and function.

2. Explain conduction of nerve impulse.
3. Briefly describe synaptic transmission.
4. Describe briefly hormones as chemical messenger.
5. Explain briefly feedback mechanism of hormone regulation.
6. Explain sol-gel theory of amoeboid movement.
7. Describe ciliary movement in *Paramecium*.
8. Give an account on types of wings in insects.
9. Explain types of fins in Pisces.
10. Describe sliding filament theory.
11. Describe briefly asexual reproduction in animals.
12. Describe the structure and function of tube feet.
13. Describe spermatogenesis.
14. Describe oogenesis.
15. Describe briefly the structure of mammalian gametes.
16. Give an account on types of fertilization.

**Unit 3: (5 Marks)**

1. Write a note on irritability in *Paramecium*
2. Write a note on resting potential of nerve membrane.
3. Write a note on action potential of nerve membrane.
4. Describe different types of neurons on the basis of structure.
5. Describe briefly different types of neurons on the basis of functions.
6. Describe the structure of synapse.
7. Write a note on striated muscle fibre.
8. Describe the structure of cilia.
9. Give an account on types of legs in insects.
10. Write a note on ovo-viviparity.
11. Write a note on viviparity.
12. Write a note on oviparity.
13. Describe the structure of mammalian egg.
14. Describe the structure of mammalian sperm.
15. Describe the formation of gemmule in sponges.
16. Write a note on budding as asexual reproduction in mammals

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit 1: (5 Marks)**

1. How do honey bees communicate for foraging?
2. What is classical conditioning? Explain with an example.
3. What is imprinting? Explain different types of imprinting.
4. What do you mean by learning? Describe any two types of learning.
5. Describe the various ways in which ants communicate.
6. What is the significance of mimicry and warning coloration?
7. What is mimicry? Explain different types of mimicry with examples.
8. What is displacement activity? In what situations do displacement activities occur? Explain with examples.
9. Write notes on:
  - i. Migration in Fish
  - ii. Territorial behavior
  - iii. Schooling behavior in fish
  - iv. Altruism and kinship
10. Which are the different types of social groups seen in non human primates?
11. Comment on any two aspects of non human primate social behavior.

**Unit 2: (10 Marks)**

1. Give an account of the life history and pathogenicity of the parasite causing amoebic dysentery.
2. Describe in detail part of life cycle of *P. vivax* in mosquito.
3. Give an account of asexual cycle of *P. vivax* in man.
4. Describe the life history of *Taenia solium*.
5. Give an account of parasitic adaptive features of *Taenia solium*.
6. Give an account of the life history of *Fasciola hepatica*.
7. Give an account of the life history of filarial worm and discuss its pathogenic effects.
8. Describe the life history of bedbug and suggest some control measures.
9. Give an account of the life history of *Sarcoptes scabiei*.
10. Give an account of the life history of head louse *Pediculus*.
11. What is bird flu? How is it spread and what are its symptoms?
12. How would you control the transmission of anthrax among humans?
13. How is anthrax transmitted to man?

**Unit 2: (5 Marks)**

1. Describe the structure of *E. histolytica*.
2. Where is *E. histolytica* found and what disease does it cause?
3. Write a short note on pathogenicity of *E. histolytica*.

4. Briefly describe the life cycle of *E. histolytica*.
5. What are the symptoms of malaria? Write its control measures.
6. Give an account of symptoms and pathogenicity of *Plasmodium vivax*.
7. Illustrate the complete life history of *T. solium* with the help of diagram only.
8. What is the effect of *Fasciola* on the hosts?
9. What are the primary and secondary hosts of *Wuchereria bancrofti*? Which stage of *Wuchereria* is infective for man?
10. What is host specificity?
11. What are the signs and symptoms of bird flu?
12. How is rabies transmitted?
13. What are the preventive measures to be taken to prevent infection of rabies virus?
14. What is toxoplasmosis and what are its causes?
15. Write notes on:
  - i. Parasitic adaptations in endoparasites
  - ii. Cysticercus or bladder worm.
  - iii. Pathogenicity of *Wuchereria*
  - iv. Control measures of bedbug.
  - v. Types of hosts

**Unit 3: (10 Marks)**

1. What does the modern method of apiculture include? Explain in brief.
2. How is an artificial bee hive constructed?
3. How do you select the flora and bee species for apiculture?
4. What are the benefits of vermiculture?
5. Describe any two methods of vermiculture.
6. How is raw milk processed?
7. What are the common adulterants of milk in India?

**Unit 3: (5 Marks)**

1. State the economic importance of honey and beeswax.
2. What are the disadvantages of the indigenous method of apiculture?
3. How does the wax moth cause damage to the honey comb?
4. Name any two bee enemies and explain how they harm the bees.
5. Give an account of the commonly found species of honey bee in India.
6. What are the advantages of the modern method of apiculture?
7. Which type of flora is beneficial for apiculture?
8. Which type of bee is suitable for apiculture?
9. What is the chemical composition of honey?
10. What is the suitable material for culturing earthworms?
11. What are the advantages of processing dairy products?

12. What is skimmed milk and toned milk? How are they prepared?  
13. How is recombined milk prepared?

**PRACTICAL**  
**USZOP3 (Course V)**  
**Skeleton-Practical Examination Question Paper Pattern**

**Time: 2 hrs**

**Marks: 50**

**Major Question**

15 marks

Q1. Extraction and detection of DNA

OR

Q1. Extraction and detection of RNA

**Minor Question**

07 marks

Q2. Mounting of Barr bodies

OR

Q2. Study of mitosis-Temporary squash preparation of Onion root tip

OR

Q2. Detection of blood groups and Rh factor

Q3. Problems on Genetics and Molecular biology (Transcription /Genetic code)

10 marks

(01 problem each)

- Q4. Identification 08 marks  
    a. Chromosome morphology  
    b. Pedigree analysis
- Q5. Viva and Journal 10 marks

**PRACTICAL**  
**USZOP3 (Course VI)**  
**Skeleton-Practical Examination Question Paper Pattern**

**Time: 2 hrs** **Marks: 50**

**Major Question** 15 marks

Q1. Urine analysis—Normal and abnormal constituents

**Minor Question** 10 marks

Q2. Detection of ammonia in water excreted by fish

OR

Q2. Detection of uric acid from excreta of Birds

Q3. Identification 15 marks

- c. Nutritional apparatus
- d. Respiratory structures
- e. Locomotory organs
- f. Study of hearts
- g. Permanent slides on reproduction



Q4. Viva

05 marks

Q5. Journal

05 marks

**PRACTICAL**  
**USZOP3 (Course VII)**  
**Skeleton -Practical Examination Question Paper Pattern**

**Time: 2 hrs**

**Marks: 50**

**Major Question**

12 marks

Q1. Extraction of Casein from Milk and its qualitative estimation

OR

Q1. Preparation of paneer from the given milk sample.

OR

Q1. Measurement of density of milk using different samples by lactometer

**Minor Question**

08 marks

Q2. Life Cycle of Honey Bee and Bee Hive

OR

Q2. Mouthparts of Honey Bee

OR

Q2. Legs of Honey Bee

OR

Q2. Sting Apparatus of Honey Bee

Q3. Identify and describe as per instructions

15 marks

- a. Ethology
- b. Protozoan parasites
- c. Helminth parasites
- d. Ectoparasites
- e. Parasitic adaptations

Q4. Project submission and Viva based on project

10 marks

Q5. Journal

05 marks

<b>SEMESTER IV</b>			
<b>USZO401 COURSE-8</b>			
<b>Origin and evolution of Life, Population genetics and evolution, Scientific Attitude methodology , writing and ethics</b>			
<b>Unit 1 : Origin and evolution of Life</b>		<b>15L</b>	<b>30hrs</b>
<b>Objective :</b> ➤ <i>To impart scientific knowledge to the learner about how life originated and evolved on our planet.</i>			
<b>Desired Outcomes :</b> ➤ <i>Learner will gain insight about origin of life.</i> ➤ <i>Learner will know about the different theories of evolution.</i>			
<b>1.1</b>	<b>Introduction.</b> ➤ Origin of universe ➤ Chemical evolution - Miller-Urey experiment, Haldane and Oparin theory ➤ Origin of life ➤ Origin of eukaryotic cell.	<b>5L</b>	<b>10hrs</b>
<b>1.2</b>	<b>Evidences in favour of organic evolution</b> ➤ Evidences from: Geographical distribution, Paleontology	<b>4L</b>	<b>8hrs</b>

	Anatomy, Embryology, Physiology and Genetics.		
<b>1.3</b>	<b>Theories of organic evolution</b> <ul style="list-style-type: none"> <li>➤ Theory of Lamarck.</li> <li>➤ Theory of Darwin and Neo Darwinism</li> <li>➤ Mutation Theory</li> <li>➤ Modern Synthetic theory</li> <li>➤ Weismans germplasm theory</li> <li>➤ Neutral theory of molecular evolution</li> </ul>	<b>6L</b>	<b>12hrs</b>
	<b>Unit 2: Population genetics and evolution</b>	<b>15L</b>	<b>28hrs</b>
	<b>Objective:</b> <ul style="list-style-type: none"> <li>➤ <i>To develop learner's knowledge and understanding of genetic variability within a population and how the change in the gene pool leads to evolution of species.</i></li> </ul>		
	<b>Desired Outcomes:</b> <ul style="list-style-type: none"> <li>➤ <i>Learner would understand the forces that cause evolutionary changes in natural populations.</i></li> <li>➤ <i>Learner would comprehend the mechanisms of speciation</i></li> <li>➤ <i>Learner will be able to distinguish between microevolution, macroevolution and megaevolution</i></li> </ul>		
<b>2.1</b>	<b>Introduction to population genetics</b>	<b>1L</b>	<b>3hrs</b>
	<ul style="list-style-type: none"> <li>➤ Definition</li> </ul>		
<b>2.1.1</b>	<b>Brief explanation of the following terms:</b> <ul style="list-style-type: none"> <li>➤ Population, gene pool, Allele frequency, genotype frequency, phenotype frequency, microevolution</li> </ul>		
<b>2.2</b>	<b>Population genetics</b>	<b>6L</b>	<b>10hrs</b>
<b>2.2.1</b>	<ul style="list-style-type: none"> <li>➤ Hardy-Weinberg Law</li> </ul>		
<b>2.2.2</b>	<ul style="list-style-type: none"> <li>➤ Factors that disrupt Hardy Weinberg equilibrium-</li> <li>➤ Mutation,</li> <li>➤ Migration (Gene flow),</li> <li>➤ Non-random mating (Inbreeding, inbreeding depression, Assortative mating-Positive and Negative, Disassortative mating),</li> <li>➤ Genetic drift (Sampling error, fixation, Bottleneck effect and Founder effect)</li> <li>➤ Natural Selection.</li> </ul>		

2.2.3	<b>Patterns of Natural Selection</b> <ul style="list-style-type: none"> <li>➤ Stabilizing selection,</li> <li>➤ Directional Selection (Examples: Peppered moth, Antibiotic resistance in bacteria, Pesticide resistance)</li> <li>➤ Disruptive selection</li> </ul>		
2.3	<b>Evolutionary genetics</b> <ul style="list-style-type: none"> <li>➤ <b>Genetic variation:</b> Genetic basis of variation-Mutations and Recombination (crossing over during meiosis, independent assortment of chromosomes during meiosis and random union of gametes during fertilization).</li> <li>➤ Nature of genetic variations- Genetic polymorphism, Balanced polymorphism, Mechanisms that preserve balanced polymorphism-Heterozygote advantage and frequency dependent selection,</li> <li>➤ Neutral variations.</li> <li>➤ Geographic variation (Cline).</li> </ul>	8L	15hrs
2.3.1	<ul style="list-style-type: none"> <li>➤ <b>Species Concept:</b> Biological species concept and evolutionary species concept</li> </ul>		
2.3.2	<b>Speciation and Isolating mechanisms:</b> <ul style="list-style-type: none"> <li>➤ Definition and Modes of speciation (Allopatric, Sympatric , Parapatric and Peripatric )</li> <li>➤ Geographical isolation</li> <li>➤ Reproductive isolation and its isolating mechanisms (Prezygotic and Postzygotic)</li> </ul>		
2.3.3	<b>Macroevolution and Megaevolution :</b> <ul style="list-style-type: none"> <li>➤ Concept and Patterns of macroevolution (Stasis, Preadaptation /Exaptation, Mass extinctions, Adaptive radiation and Coevolution),</li> <li>➤ Megaevolution</li> </ul>		
	<b>Unit 3: Scientific Attitude methodology , writing and ethics</b>	15L	32hrs
	<b>Objective:</b> <ul style="list-style-type: none"> <li>➤ <i>To inculcate scientific temperament in the learner.</i></li> </ul>		
	<b>Desired outcome:</b> <ul style="list-style-type: none"> <li>➤ <i>The learner will develop qualities such as critical thinking and analysis.</i></li> <li>➤ <i>The learner will develop the skills of scientific communication.</i></li> <li>➤ <i>Learner will understand the ethical aspects of research</i></li> </ul>		
3.1	<b>Process of science: A dynamic approach to investigation</b>	4L	10hrs

	<b>The Scientific method</b> ➤ Deductive reasoning and inductive reasoning, Critical thinking, Role of chance in scientific discovery		
	<b>Scientific Research</b> ➤ Definition, difference between method and methodology characteristics, types		
	<b>Steps in the Scientific Method</b> ➤ Identification of research problem, Formulation of research hypothesis, Testing the hypothesis using experiments or surveys, Preparing research/study design including methodology and execution (Appropriate controls, sample size, technically sound, free from bias, repeat experiments for consistency), Documentation of data, Data analysis and interpretation, Results and Conclusions		
	<b>Dissemination of data</b> ➤ Reporting results to scientific community (Publication in peer-reviewed journals, thesis, dissertation, reports, oral presentation, poster presentation)		
	<b>Application of knowledge</b> ➤ Basic research, Applied research, Translational research, Patent		
<b>3.2</b>	<b>Scientific writing</b>	<b>4L</b>	<b>10hrs</b>
	<b>Structure and components of a research paper</b> ➤ (Preparation of manuscript for publication of research paper)- Title, Authors and their affiliations, Abstract, Keywords and Abbreviations, Introduction, Material and Methods, Results, Discussion, Conclusions, Acknowledgement, Bibliography; Figures, Tables and their legends		
<b>3.3</b>	<b>Writing a review paper</b>	<b>3L</b>	<b>5hrs</b>
	<b>Structure and components of research report:</b> ➤ Report writing, Types of report		
	<b>Computer application</b> ➤ Plotting of graphs, Statistical analysis of data. Internet and its application in research-Literature survey, Online submission of manuscript for publication		
<b>3.4</b>	<b>Ethics</b>	<b>3L</b>	<b>5hrs</b>
	<b>Ethics in animal research</b> ➤ The ethical and sensitive care and use of animals in research, teaching and testing, Approval from Institutional animal ethics		

	Committee.		
	<b>Ethics in clinical research</b> ➤ Approval from Clinical Research Ethics Committee ➤ Informed consent		
	<b>Approval from concerned/ appropriate authorities :</b> ➤ National Biodiversity Authority ➤ State Biodiversity Board ➤ Forest Department		
	<b>Conflict of interest</b>		
3.5	<b>Plagiarism</b>	1L	2hrs
	<b>USZO402 COURSE-9</b>		
	<b>Cell Biology, Endo membrane System and Biomolecules</b>		
	<b>Unit 1 : Cell Biology</b>	15L	26hrs
	<b>Objective :</b> ➤ <i>To study the structural and functional organization of cell with an emphasis on nucleus, plasma membrane and cytoskeleton.</i>		
	<b>Desired outcome :</b> ➤ <i>Learner would acquire insight of transport mechanisms for maintenance and composition of cell</i>		
1.1	<b>Introduction to cell biology</b> ➤ Definition and scope ➤ Cell theory ➤ Generalized prokaryotic , eukaryotic cell: size, shape and structure	2L	4hrs
1.2	<b>Nucleus</b> ➤ Size, shape, number and position ➤ Structure and functions of interphase nucleus ➤ Ultrastructure of nuclear membrane and pore complex ➤ Nucleolus: general organization, chemical composition and functions ➤ Nuclear sap/ nuclear matrix ➤ Nucleocytoplasmic interactions	5L	6hrs
1.3	<b>Plasma membrane</b> a. Fluid Mosaic Model b. Junctional complexes c. Membrane receptors	4L	8hrs

	d. Modifications: Microvilli, Desmosomes and Plasmodesmata.		
<b>1.4</b>	<b>Transport across membrane</b> a. Diffusion and Osmosis b. Transport: Passive and Active c. Endocytosis and Exocytosis	<b>2L</b>	<b>4hrs</b>
<b>1.5</b>	<b>Cytoskeletal structures</b> ➤ Microtubules: Composition and functions ➤ Microfilaments: Composition and functions	<b>2L</b>	<b>4hrs</b>
<b>Unit 2 Endomembrane System</b>		<b>15L</b>	<b>25hrs</b>
	<b>Objective :</b> ➤ To acquaint the learner with Ultrastructure of cell organelles and their functions.		
	<b>Desired outcome:</b> ➤ Learner would appreciate the intricacy of endomembrane system. ➤ Learner would understand the interlinking of endomembrane system for functioning of cell.		
<b>2.1</b>	<b>Endoplasmic reticulum</b> ➤ Discovery, occurrence and Types ➤ Ultrastructure and Functions	<b>3L</b>	<b>5hrs</b>
<b>2.2</b>	<b>Golgi complex</b> ➤ Origin, occurrence and morphology ➤ Ultra structure and functions	<b>3L</b>	<b>4hrs</b>
<b>2.3</b>	<b>Lysosomes</b> ➤ Origin, occurrence and polymorphism ➤ Ultrastructure and Functions	<b>3L</b>	<b>4hr</b>
<b>2.4</b>	<b>Mitochondria</b> ➤ Origin, occurrence and morphology ➤ Ultrastructure and functions ➤ Marker enzymes, Mitochondrial biogenesis, Semiautonomous nature of mitochondria	<b>6L</b>	<b>12hrs</b>
<b>Unit 3: Biomolecules</b>		<b>15L</b>	<b>30hrs</b>
	<b>Objective :</b> ➤ To give learner insight into the structure of biomolecules, and their role in sustenance of life.		

	<b>Desired outcome:</b> ➤ <i>The learner will realize the importance of biomolecules and their clinical significance.</i>		
<b>3.1</b>	<b>Biomolecules</b> ➤ Concept of Micromolecules and Macromolecules.	2L	5hrs
<b>3.2</b>	<b>Carbohydrates</b> ➤ Definition Classification, Properties and Isomerism, Glycosidic bond ➤ Structure of a. Monosaccharides- Glucose and Fructose b. Disaccharides - Lactose and Sucrose c. Polysaccharides - Cellulose, Starch, Glycogen and Chitin ➤ Biological role and their Clinical significance	4L	8hrs
<b>3.3</b>	<b>Amino Acids and Proteins</b> ➤ Basic structure of amino acid, classification of amino acids , Essential and Non-essential amino acids, Peptide bond ➤ Protein conformation : Primary, Secondary, Tertiary, Quaternary ➤ Types of proteins – Structural (Keratin, Collagen) and functional proteins (Hemoglobin) ➤ Biological role and their Clinical significance	5L	8hrs
<b>3.4</b>	<b>Lipids</b> ➤ Definition, classification of lipids with examples, Ester linkage ➤ Physical and Chemical properties of lipids ➤ Saturated and Unsaturated fatty acids , Essential fatty acids ➤ Triacylglycerols, Phospholipids (Lecithin and Cephalin) and Steroids (Cholesterol). ➤ Biological role and their Clinical significance	4L	5hrs
<b>3.5</b>	<b>Vitamins</b> ➤ Water soluble vitamins(e.g. Vit C, Vit B12) ➤ Lipid soluble vitamins (e.g. Vit A, Vit D) ➤ Biological role and their Clinical significance	2L	4hrs
<b>USZO403 COURSE-10</b>			
<b>Comparative Embryology, Aspects of Human Reproduction, Pollution and its effect on organisms</b>			
<b>UNIT 1: Comparative Embryology</b>		<b>15L</b>	<b>25hrs</b>
	<b>Objective:</b> ➤ <i>To acquaint the learner with key concepts of embryology.</i>		
	<b>Desired Outcomes:</b>		



	<ul style="list-style-type: none"> <li>➤ Learner will be able to understand and compare the different pre- embryonic stages</li> <li>➤ Learner will be able to appreciate the functional aspects of extra embryonic membranes and classify the different types of placentae.</li> </ul>		
1.1	➤ Types of Eggs- Based on amount and distribution of yolk	2L	4hrs
1.2	➤ Structure and Types of Sperms	1L	1hr
1.3	➤ Types of Cleavages.- Holoblastic and Meroblastic	1L	3hrs
1.4	➤ Types of Blastulae	1L	3hrs
1.5	➤ Gastrulation	2L	4hrs
1.6	➤ Coelom -Formation and types	2L	3hrs
1.7	<ul style="list-style-type: none"> <li>➤ Extra embryonic membranes</li> <li>➤ Types of Placentae -Based on histology, morphology and implantation</li> </ul>	6L	10hrs
<b>UNIT 2: Aspects of Human Reproduction</b>		<b>15L</b>	<b>30 hrs</b>
	<b>Objectives:</b> <ul style="list-style-type: none"> <li>➤ To acquaint the learners with different aspects of human reproduction.</li> <li>➤ To make them aware of the causes of infertility, techniques to overcome infertility and the concept of birth control</li> </ul>		
	<b>Desired Outcome:</b> <ul style="list-style-type: none"> <li>➤ Learners will be able to understand human reproductive physiology</li> <li>➤ Learners will become familiar with advances in ART and related ethical issues.</li> </ul>		
2.1	<b>Human Reproductive system and Hormonal regulation</b> <ul style="list-style-type: none"> <li>➤ Anatomy of human male and female reproductive system</li> <li>➤ Hormonal regulation of Reproduction and Impact of age on reproduction-Menopause and Andropause</li> </ul>	2L	4hrs
2.2	<b>Contraception &amp; birth control</b> <ul style="list-style-type: none"> <li>➤ Difference between contraception and birth control</li> <li>➤ Natural Methods: Abstinence , Rhythm method, Temperature method, cervical mucus or Billings method, Coitus interruptus, Lactation amenorrhea</li> <li>➤ Artificial methods : Barrier methods, Hormonal methods, Intrauterine contraceptives, Sterilization, Termination , Abortion</li> </ul>	2L	4hrs

2.3	<b>Infertility</b> <b>Female infertility</b> <ul style="list-style-type: none"> <li>➤ <b>Causes</b> - Failure to ovulate; production of infertile eggs ; damage to oviducts (oviduct scarring and PID or Pelvic inflammatory disease, TB of oviduct), Uterus (T. B. of uterus and cervix)</li> <li>➤ <b>Infertility associated disorders</b> (Endometriosis, Polycystic Ovarian syndrome (PCOS), POF (Primary ovarian failure) STDs (Gonorrhea, Chlamydia, Syphilis and Genital Herpes); Antibodies to sperm; Genetic causes-Recurrent abortions; Role of endocrine disruptors</li> </ul>	4L	8hrs
	<b>Male infertility</b> <b>Causes :</b> Testicular failure, infections of epididymis, seminal vesicles or prostate, hypogonadism, cryptorchidism , congenital abnormalities ,Varicocele , Blockage, Azoospermia, Oligospermia, abnormal sperms, autoimmunity, ejaculatory disorders and Idiopathic infertility.		
2.5	<b>Treatment of Infertility</b> <ul style="list-style-type: none"> <li>➤ Removal /reduction of causative environmental factors</li> <li>➤ Surgical treatment</li> <li>➤ Hormonal treatment- Fertility drugs</li> <li>➤ Assisted Reproductive Technology</li> <li>➤ Sperm banks, cryopreservation of gametes and embryos</li> <li>➤ Surrogacy</li> </ul>	4L	8hrs
2.6	<b>Techniques and Ethical considerations of ART</b> <ul style="list-style-type: none"> <li>➤ In vitro fertilization, Embryo transfer (ET), Intra-fallopian transfer (IFT), Intrauterine transfer (IUT), Gamete intra-fallopian transfer (GIFT), intra-zygote transfer (ZIFT), Intracytoplasmic sperm injection (ICSI) with ejaculated sperm and sperm retrieved from testicular biopsies – Testicular sperm extraction (TESE), Pronuclear stage transfer (PROST).</li> </ul>	3L	6hrs
	<b>UNIT3: Pollution and its effect on organisms</b>	15L	27hrs
	<b>Objective:</b> <ul style="list-style-type: none"> <li>➤ <i>To provide a panoramic view of impact of human activities leading to pollution and its implications.</i></li> </ul>		
	<b>Desired Outcome :</b> <ul style="list-style-type: none"> <li>➤ <i>The learners will be sensitized about the adverse effects of pollution and measures to control it.</i></li> </ul>		

<b>3.1</b>	<b>Air Pollution</b> ➤ Types and sources of air pollutants ➤ Effects and control measures	3L	6hrs
<b>3.2</b>	<b>Water Pollution</b> ➤ Types and sources of water pollutants ➤ Effects and control measures	3L	6hrs
<b>3.3</b>	<b>Soil Pollution</b> ➤ Types and sources of soil pollutants ➤ Effects and control measures	3L	4hrs
<b>3.4</b>	<b>Noise pollution</b> ➤ Different means of noise pollution ➤ Effects and control measures	1L	3hrs
<b>3.5</b>	<b>Radioactive pollution</b>	1L	2hrs
<b>3.6</b>	<b>Solid waste Pollution</b> ➤ Types and sources, ➤ Effects and control	2L	4hrs
<b>3.7</b>	<b>Pollution – Climate change and Global warming</b>	2L	2hrs

	<b>SEMESTER IV</b>
	<b>Practical USZOP4 (Course VIII)</b>
<b>1</b>	Study of population density by Line transect method & Quadrant method and calculate different diversity indices. a. Index of Dominance. b. Index of frequency. c. Rarity Index. d. Shannon Index. e. Index of species diversity

2	Study of Prokaryotic cells (bacteria) by Crystal violet staining technique.
3	Study of Eukaryotic cells (WBCs) from blood smear by Leishman's stain.
4	Identification and study of fossils a. Arthropods : Trilobite b. Mollusca: Ammonite c. Aves : Archaeopteryx
5	Identification of a) Allopatric speciation ( Cyprinodon species) b) Sympatric speciation.( hawthorn fly and apple maggot fly) c) Parapatric speciation. (Snail)
6	Bibliography/ Abstract writing.
7	Preparation of Power point presentation
<b>Practical USZOP4 (Course IX)</b>	
1	Study of permeability of cell through plasma membrane (Osmosis in blood cells).
2	Measurement of cell diameter by oculometer (by using permanent slide )
3	Qualitative tests for carbohydrates (Molisch's test, Benedicts test, Barfoed's test, Anthrone test)
4	Qualitative tests for protein ( Ninhydrin test, Biuret test, Millon's test, Xanthoproteic test)
5	Qualitative test for lipids ( solubility test, Sudan III test)
6	Study of rancidity of lipid by titrimetric method.
7	Ultra structure of cell organelles – (Electron micrographs) a. Nucleus b. Endoplasmic reticulum (Smooth and rough) c. Mitochondria. d. Golgi apparatus e. Lysosomes
8	Study of clinical disorders due to carbohydrates, proteins and lipids imbalance.(photograph to be provided / significance to given and disorder to be identified) a. Hyperglycemia , Hypoglycemia. b. Thalessemia, Kwashiorkar c. Obesity, Atherosclerosis
<b>Practical USZOP4 (Course X)</b>	

<b>1</b>	Estimation of Dissolved oxygen from the given water sample .
<b>2</b>	Estimation of Salinity by refractometer from the given water sample.
<b>3</b>	Estimation of conductivity by conductometer from the given water sample .
<b>4</b>	Determination of blood pressure by sphygmomanometer.
<b>5</b>	Detection of Creatinine in urine.
<b>6</b>	Determination of blood sugar by GOD and POD method
<b>7</b>	Study of bleeding time and clotting time.
<b>8</b>	Study of the following permanent slides, museum specimens and materials. a. Mammalian sperm and ovum. b. Egg types –Fish eggs, Frog eggs , Hen's egg. c. Cleavage , blastula and gastrula (Amphioxus, Frog and Bird).
<b>9</b>	Study of commercially important fishery (Catla, Rohu, Catfish, Mackerel, Pomfret, Bombay duck, Prawn/ Shrimp, Crab, Lobster, Edible oyster)
<b>10</b>	Review writing based on programmes telecast by Doordarshan, Discovery channel, Gyandarshan, UGC programmes, Animal planet
<b>11</b>	Study of natural ecosystem and field report of the visit

**Note -The practicals may be conducted by using specimens authorised by the wildlife and such other regulating authorities though it is strongly recommended that the same should be taught by using photographs/audio-visual aids/ simulations / models, etc. as recommended by the UGC and as envisaged in the regulations of the relevant monitoring bodies. No new specimens, however, shall be procured for the purpose of conducting practicals mentioned here-in-above.**

**#There shall be at least one excursion/field trip**

## **Semester IV**

### **REFERENCE AND ADDITIONAL READING**

#### **COURSE-VIII (USZO401)**

1. Theory of Evolution- Smith, Cambridge Press, and Low price Ed.
2. Evolution - Strickberger, CBS publication
3. Evolution- P.S.Verma and Agarwal
4. Introduction to Evolution by Moody
5. Biology. E. P. Solomon, L. R. Berg, D. W. Martin, Thompson Brooks/Cole

6. Biology -The Unity and Diversity of Life. C. Starr, R. Taggart, C. Evers, L. Starr, Brooks/Cole Cengage learning International Edition
7. Research Methodology, Methods and Techniques- by C.R. Kothari, Wiley Eastern Ltd. Mumbai
8. Practical research planning and design 2<sup>nd</sup> edition- Paul D Leedy, Macmilan Publication

### **COURSE-IX (USZO402)**

1. Cell Biology by Singh and Tomoar Rastogi Publication..
2. Cell and molecular Biology E.D.P De Robertis and E.M.R Robertis ,CBS Publishers and Distributors
3. The cell A molecular Approach Goeffrey M.Coper ASM Press Washington D.C.
4. A textbook of cytology Suruchi Tyagi Dominant Publishers and Distributors New Delhi.
5. Cell and molecular biology Gupta P.K , Rastogi Publication, India.
6. Cell Biology Pawar C.B. Himalaya publication
7. Molecular Biology of the cell (6<sup>th</sup> ed) by the Insertus
8. Campbell Biology (9<sup>th</sup> Ed.)
9. Principles of Biochemistry, 2005, 2<sup>nd</sup> and 3<sup>rd</sup> edn. Lehninger A.L. Nelson D.L. and Cox M.M ,
10. Biochemistry, Dushyant Kumar Shurma, 2010, Narosa Publishing house PVT.Ltd.
11. Fundamentals of Biochemistry, Dr AC Deb, 1983, New Central Book Agency Ltd.
12. A Textbook of Biochemistry, 9<sup>th</sup> edition , Dr. Rama Rao A.V.S.S and Dr A Suryalakshmi.
13. Biochemistry-G Zubay , Addison Wesley, 1983
14. Biochemistry, L Stryer, 3rd/4th/5th ed, 1989 , Freeman and Co. NY
15. Harper's Biochemistry,1996, 26<sup>th</sup> edition, Murray R.K. Granner D.K. Mayes P.A. Rodwell V.M. Hall international USA
16. Outline of Biochemistry, 1976, E.E. Conn and P.K. Stumpf. John Wiley and Sons USA

### **COURSE-X (USZO403)**

1. Developmental Biology- 5<sup>th</sup> Edition, Scot F. Gilbert, Sinauer Associates Inc.
2. Developmental Biology- Subramoniam T., Narosa Publishers.
3. Developmental Biology- Berril N.J., Tata Mc Graw –Hill Publication.
4. Essential Reproduction-Martin H. Johnson, Wiley-Blackwell Publication.
5. Chick Embryology- Bradley M. Pattern.
6. Embryology- Mohan P. Arora.
7. Chordate Embryology- Dalela, Verma and Tyagi

8. Human Anatomy and Physiology. E. L. Marieb, Pearson Education Low Price Edition
9. Biological Science. Taylor, Green and Stout. Cambridge Publication
10. Biology. E. P. Solomon, L. R. Berg, D. W. Martin, Thompson Brooks/Cole
11. Human Biology-Daniel D Chiras Jones and Bartlett
12. The Physiology of Reproduction Vol I & II - E.K. Nobil and JU. D.Neil, Raven Press, New York.
12. Air Pollution, Kudesia V.P. Pragati Prakasan, Meerut
13. Fundamentals of Air Pollution Daniel A. Vallero, Academic press 5<sup>th</sup> Edition
14. Principles and Practices of Air Pollution Control and Analysis J.R. Mudakani I K International Pub. House Pvt. Ltd.
15. Text Book of Air Pollution and its Control, S.C.Bhatia Atlantic
16. Water Pollution, Kudesia V.P., Pragati Prakasan, Meerut
17. A text book of Environmental Chemistry and Pollution Control, S.S.Dogra, Swastic Pub, New Delhi
18. Practical Methods for water and Air Pollution Monitoring, S.K. Bhargava, New Age International
19. Hand Book of Water and waste water Analysis, Kanwaljit Kaur, Atlantic
20. Aquatic Pollution by Edward A. Laws
21. Environmental Science and Technology, Stanely E. Manahan
22. Environmental Chemistry, A.K. De, New Age International
23. A Text Book of Environmental Studies, Gurdeep R. Chatwal, Harish Sharma, Madhu Arora, Himalaya

### **SCHEME OF EXAMINATION (THEORY)**

- (a) Internal assessment of twenty five (25) marks per course per semester should be conducted according to the guidelines given by University of Mumbai vide circular number UG/04 of 2014 Dated 5th June 2014 to be implemented from academic year 2015-16.
- (b) External assessment of seventy five (75) marks per course per semester should be conducted as per the following skeleton question paper pattern.
- (c) One practical examination of fifty (50) marks per course each should be conducted at the end of every semester.

**SKELETON- EXAMINATION PATTERN FOR THE ABOVE SYLLABUS**

All Questions are compulsory  
Figures to the right indicate full marks

**Time: 2.5 hours**

**Total marks: 75**

Q.1.	UNIT 1 Answer any four out of eight (5 marks each)	20 marks
Q.2.	UNIT 2 a. Answer any one of the two (10 marks) b. Answer any two out of the four (5 marks each)	20 marks
Q.3.	UNIT 3 Answer any two out of four (10 marks each)	20 marks
Q.4.	a. Unit 1 - (One note of five marks OR objective type questions) b. Unit 2 - (One note of five marks OR objective type questions) c. Unit 3- (One note of five marks OR objective type questions)	15 marks

\*For Question 4 it is recommended to have objective questions such as –

- |                       |                                |
|-----------------------|--------------------------------|
| (a) Match the column  | (b) MCQ                        |
| (c) Give one word for | (d) True and False             |
| (e) Define the term   | (f) Answer in one sentence etc |

**MODEL QUESTION BANK SEMESTER IV**

**USZO401(COURSE VIII)**

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit 1: (10 Marks)**



1. Write explanatory notes on;
  1. Lamarckism. 2. Darwinism and Neo Darwinism.
  3. Mutation Theory 4. Modern Synthetic theory.5. Weismans germplasm theory
2. Neutral theory of molecular evolution. (Some of them can be asked as short notes as well)
3. Discuss evidences in favor of organic evolution by giving examples of geographical distribution.
4. Discuss evidences in favor of organic evolution by giving examples of genetics, and molecular biology.
5. Discuss evidences in favor of organic evolution by giving examples of physiology and biochemistry.
6. Discuss brief account of Origin of eukaryotic cell.

**Unit 1: (5 Marks)**

1. Describe chemical evolution with Miller-Urey experiment.
2. Describe chemical evolution with Haldane and Oparin theory.
3. Write short notes on: 1. Mutation Theory 2. Modern Synthetic theory

**Unit 2: (10 Marks)**

2. Define the term 'population genetics'. Describe in brief the various evolutionary forces that tend to disturb genetic equilibrium and introduce changes in the gene pool of a population.
3. State Hardy Weinberg's law of equilibrium and discuss its salient features.
4. Give an account of the different factors involved in speciation.
5. Describe the different types of speciation.
6. Explain the role of geographic isolation in the development of new species.
7. Explain the role of reproductive isolation in the development of new species.
8. Discuss the pre-zygotic barriers responsible for reproductive isolation.
9. Discuss the post-zygotic barriers which lead to reproductive isolation.
10. Describe the sources of genetic variation in natural populations.
11. Explain the nature and extent of genetic variation within populations.
12. Describe the mechanisms that preserve balanced polymorphisms.
13. Describe the salient features of microevolution.
14. Compare and contrast microevolution and macroevolution.
15. Explain the salient features of macroevolution.
16. Give an account of the different patterns of macroevolution.
17. Elaborate on the role of adaptive radiation and extinction in macroevolution.
18. What do you understand by the term natural selection? Describe the different types of natural selection with suitable examples.

19. What is megaevolution? Explain the mechanism of megaevolution using a suitable example.

**Unit 2: (5 Marks)**

1. Explain the term 'gene pool'. How does evolution operate via the gene pools of populations?
2. Differentiate between:
  - i. Allopatric and Sympatric speciation
  - ii. Biological and evolutionary species
  - iii. Microevolution and macroevolution
  - iv. Stabilizing selection and disruptive selection
  - v. Convergent and divergent evolution
3. Explain stabilizing selection with the help of a suitable example.
4. How does the example of sickle cell allele illustrate heterozygote advantage?
5. How does frequency-dependent selection affect genetic variation within a population over time?
6. Write short notes on:
  - i. Role of mutations in evolution
  - ii. Role of migration in evolution
  - iii. Non-random mating
  - iv. Role of natural selection in evolution
  - v. Genetic drift
  - vi. Bottleneck effect
  - vii. Founder effect
  - viii. Directional evolution in peppered moth
  - ix. Evolution of Antibiotic resistance in bacteria
  - x. Geographic variation
  - xi. Genetic polymorphism
  - xii. Parapatric speciation
  - xiii. Adaptive radiation
7. What is the biological species concept? What are its limitations? How does it differ from the evolutionary species concept?
8. Explain the concept of co evolution using suitable examples

**Unit 3: (10 Marks)**

1. Describe briefly, the steps towards preparing a research design.
2. Describe literature survey, collection of data and its analysis.
3. What is a patent and how is it obtained?
4. Write an account on application of statistics in research.

**Unit 3: (5 Marks)**

1. Define research. State the difference between research method and research methodology.
2. Write a note on computer application in research.
3. Describe briefly identification of research problem and formulation of research hypothesis.
4. What is abstract writing?
5. What is plagiarism?
6. What is bibliography?
7. Write a short note on ethics in animal research.
8. Write a short note on ethics in clinical research.

**MODEL QUESTION BANK SEMESTER IV**

**USZO402(COURSE IX)**

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit 1: (10 marks)**

1. Explain prokaryotic cell
2. Explain Eukaryotic cell
3. Give an account of cell theory
4. Describe ultrastructure of nuclear membrane
5. State chemical composition and functions of nucleolus
6. Describe nucleocytoplasmic reactions
7. Explain r RNA processing
8. Describe fluid mosaic model of plasma membrane
9. Give an account of active and passive transport
10. Describe various modifications of plasma membrane
11. Explain pinocytosis, phagocytosis and secretion
12. Give an account of cell permeability
13. Differentiate prokaryotic and eukaryotic cell

**Unit 1: (5 Marks)**

1. Virus
2. Nuclear matrix
3. Number and position of nucleus
4. Molecular organization of chromatin

5. Unit membrane concept
6. Nucleolus
7. Membrane receptors
8. Sandwich model
9. Cell coat
10. Cell recognition

**Unit 2: (10 Marks )**

1. Describe Ultrastructure of Endoplasmic Reticulum
2. Describe types of Endoplasmic Reticulum and add a note on their functions
3. Give an account of Ultrastructure and functions of Golgi complex
4. Explain Ultrastructure and morphology of lysosomes
5. Comment on Semiautonomous nature of mitochondria
6. Describe ultrastructure and function of mitochondria
7. Explain protein import in mitochondria
8. Explain ultrastructure of microtubules
9. Describe chemical composition and functions of microfilaments
10. Give an account of biochemical composition and functions of microtubules.

**Unit 2: ( 5 Marks)**

1. Occurrence of Endoplasmic Reticulum
2. Significance of Endoplasmic Reticulum
3. Occurrence and morphology of golgi complex
4. Polymorphism in lysosomes
5. Significance of lysosomes
6. Occurrence and morphology of lysosomes
7. Marker enzymes in mitochondria
8. Significance of mitochondria
9. Location and significance of microfilaments
10. Significance of microtubules.

**Unit 3 : (10 Marks)**

1. Discuss the chemical behavior of carbon and a note on variety of functional groups of biomolecules.
2. Explain the concept of micromolecules and macromolecules.
3. Describe the structure of water. Add a note on physic-chemical properties of water.
4. Define carbohydrate. Add a note on its classification.

5. What are carbohydrates? Explain the classification of carbohydrate with suitable examples.
6. Define and explain the classification of carbohydrates.
7. Explain with suitable example monosaccharide and disaccharide.
8. Discuss the properties of carbohydrates.
9. What are disaccharides? Draw the structures of maltose and sucrose.
10. What are polysaccharides? How are they classified. Write the structures of glycogen and heparin/ chitin and heparin.
11. Discuss about chemical structure of the monosaccharides/ disaccharides
12. What are amino acids? Discuss classification of amino acids based on R group.
13. Give an account of primary and secondary structure of proteins.
14. Write an account on tertiary and quaternary structure of proteins.
15. Describe the structure of saturated and unsaturated fatty acids.
16. Define essential fatty acids. Add a note on it.
17. Define lipids. Write a note on mono, di and triglycerides/ phospholipids
18. What are fatty acids? Add a note on types of fatty acids.
19. Structure and functions of water soluble vitamins
20. Structure and functions of lipid soluble vitamins

**Unit 3: (5mks)**

1. Write a short note on - monomers and polymers.
2. Write note on properties of carbohydrates.
3. Give an account of polysaccharides.
4. With suitable example explain glycosidic bond.
5. Explain the linkage in lactose and sucrose.
6. Give the biological importance of carbohydrates.
7. What are essential and nonessential amino acids?
8. Give an account of properties of amino acids.
9. Define and explain peptide bond with suitable example.
10. Types of proteins with suitable examples
11. Biological roles of proteins.
12. Peptide bond
13. Types of fatty acids.
14. Biological role of lipids
15. Properties of fatty acid
16. Sterol and waxes
17. Describe properties of fatty acid/lipids
18. Discuss the clinical significance of protein / carbohydrate /lipids/
19. write short note on clinical significance of lipids

20. Write a note on - isomerism in carbohydrates and amino acids?
21. Structure and functions of vitamin A/ vitamin B/ vitamin C/ vitamin D

**MODEL QUESTION BANK SEMESTER IV**

**USZO403(COURSE X)**

**Question bank is suggestive. The paper setters are free to modify the questions or include new questions to the best of their perception**

**Unit-1: (10 Marks)**

- 1) Classify the different types of eggs..
- 2) Briefly explain types and structure of sperms (any two animals).
- 3) Define cleavage Explain types of cleavages.
- 4) Give brief account on various types of blastulae.
- 5) What is gastrulation ? Explain gastrulation in frog.
- 6) Give an account of process of coelom formation and its types.
- 7) Explain various types of placentae in mammals.
- 8) Give an account of extra embryonic membranes.
- 9) Describe briefly the types of eggs on the basis of amount and distribution of yolk.
- 10) Describe the early development of mammalian egg upto gastrulation.
- 11) Give a brief note on different types of sperms.
- 12) Write a note on blastula and explain its types.
- 13) Explain the comparative process of embryo formation.

**Unit-1: (5-Marks)**

- 1) Draw neat labeled diagram and explain any one of the following:  
(Microlecithal, Alecithal, Homolecithal, Heterolecithal, Isolecithal, Telolecithal, Centrolecithal, Discoidal ).
- 2) Explain structure of sperms of frog/ reptiles/ birds/ mammals.
- 3) Short note on Holoblastic cleavage. Or Meroblastic cleavage.
- 4) Short note on equal or unequal cleavage.
- 5) Short note on Discoblastula or Coeloblastula.
- 6) Short note on centroblastula or amphiblastula or stereoblastula,
- 7) Explain the process of coelom formation in process of gastrulation.
- 8) Short notes on : Amnion /Chorion/Allantois/Yolk sac.
- 9) Explain the function of Amnion /Chorion/Allantois/Yolk sac/.
- 10) Short note on Yolk sac placenta or Synsesmochorial placenta/Discoidal placenta/Cotyledonary placenta/Hemo-chorial placenta/Zonary placenta/Diffuse placenta

- 11) Short note on Deciduous or non-deciduous placenta
- 12) Write the functions of placenta.
- 13) What are the roles of Embryonic membranes and extra embryonic membranes

**Unit 2: (10 Marks)**

1. Describe male reproductive system and its hormonal regulation.
2. Describe female reproductive system and its hormonal regulation.
3. Define reproduction. Explain the hormonal regulation of reproduction.
4. What is contraception? Explain different methods of contraception.
5. How is contraception different from birth control?
6. Define infertility and explain the causes of female infertility.
7. What are the causes of male infertility?
8. Explain the hormonal treatment for infertility using drugs.
9. Describe the methods of treatment of infertility.
10. Give a brief account of infertility related disorders.
11. What are sperm banks? Add a note on cryopreservation of sperms.
12. What is testicular biopsy? Explain Testicular sperm extraction (TESE), Pronuclear stage transfer (PROST).
13. What are the steps involved in Embryo transfer (ET) and / Intra-fallopian transfer (IFT)?
14. What is ART technique? Add a note on IVF (steps, success and ethical considerations).

**Unit 2: (5 Marks)**

1. Write a note on impact of age on reproductive stage –
  - a. Menopause
  - b. Andropause
2. What is amenorrhea?
3. What are IUD's? How do they work as barriers for fertilization?
4. How does sterilization act as a method of contraception?
5. Write a note on birth control.
6. What is the difference between natural and artificial methods of contraception?
7. How is T.B. a cause of female infertility?
8. What are the genetic causes of infertility?
9. Write a note on STD's as infertility related disorders?
10. Explain briefly:
  - a. Impotency
  - b. Surrogacy
  - c. Endometriosis
  - d. Idiopathic infertility

11. What are the roles of endocrine disruptions in infertility?
12. Explain the role of the following in infertility:
  - a. Gonorrhoea
  - b. Syphilis
  - c. Genital Herpes
  - d. Chlamydia
13. Write a note on treatment of infertility by removal of causative environmental factors.
14. Write a note on Ethical considerations of ART.

**Unit 3: (10 Marks)**

1. What are the causes, effects and control measures for air pollution?
2. What are the causes, effects and control measures for water pollution?
3. What are the causes, effects and control measures for soil pollution?
4. What are the causes, effects and control measures for noise pollution?
5. Define air pollution and give an account of hazardous air pollutants.
6. Explain the causes of nutrient pollution and its control measures.
7. What is ocean littering? Explain in details the causes and control measures for ocean littering?
8. Describe the alteration of metabolism of micro-organisms due to soil pollution.
9. Explain noise pollution along with its measurement and permissible limits.
10. Give a brief account of methods to control gaseous / particulate matters.
11. What is pollution? Add notes on:
  - a. Effect of air pollution on vegetation.
  - b. Effect of noise pollution on animals.
12. How can the people be made aware of pollution and its effects?

**Unit 3: (5 Marks )**

1. Explain the effects of air pollution on human beings.
2. What are different types of pollutants that cause air pollution?
3. Write short notes on:
  - a. Ozone depletion
  - b. Green house gases
  - c. Global warming
  - d. Acid rain
  - e. Sonic boom
  - f. Acoustic zoning
4. Explain the effect of thermal pollution on biodiversity.
5. Write a note on solar radiation.



6. Write a note on ionizing radiation
7. How are heavy metals responsible for nutrient pollution? Cite some examples of effects of heavy metal pollution on human health.
8. How is oil spills a cause of water pollution / ocean littering?
9. How do pesticides and fertilizers contaminate water?
10. How can oil be retracted back from sea / ocean?
11. What are the effects of soil pollution on food chain?
12. How are POP's and ordinary salts responsible for nutrient pollution?
13. What are the auditory / non – auditory effects of noise pollution.
14. Why is the necessity to save drinking water?

**PRACTICAL**  
**USZOP4 (Course VIII)**  
**Skeleton -Practical Examination Question Paper Pattern**

**Time: 2 hrs**

**Marks: 50**

**Major Question**

12 marks

- Q1. Study Population density by Line transect or Quadrant method and calculate biodiversity indices (any 2)

**Minor Question**

08 marks

- Q2. Prepare a smear to show prokaryotic cell.

OR

- Q2. Prepare a smear to show eukaryotic cell.

- Q3. Identify and describe as per instructions

08 marks

- a. Fossils
- b. Speciation

- Q4. From the given article prepare the bibliography/ abstract

06 marks

- Q5. Power point presentation

06 marks

- Q6. Viva and Journal

10 marks

**PRACTICAL  
USZOP4 (Course IX )  
Skeleton -Practical Examination Question Paper Pattern**

**Time: 2 hrs**

**Marks: 50**

**Major Question**

15 marks

Q1. Study of permeability of cell through plasma membrane (Osmosis in blood cells).

OR

Q1. Measurement of cell diameter by oculometer (by using permanent slide)

**Minor Question**

10 marks

Q2. Qualitative tests for carbohydrates (Molisch's test, Benedicts test, Barfoed's test, Anthrone test)

OR

Q2. Qualitative tests for proteins (Ninhydrin test, Biuret test, Millon's test, Xanthoproteic test)

OR

Q2. Qualitative test for lipids (Solubility test, Sudan III test)

OR

Q2. Study of rancidity of lipids by titrimetric method

Q3. Identify and describe as per instructions

15 marks

1. Ultra structure of cell organelles ( a, b & c)

2. Clinical disorders (d & e)

Q4. Viva

05 marks

Q5. Journal

05 marks

**PRACTICAL  
USZOP4 (Course X)  
Skeleton -Practical Examination Question Paper Pattern**

**Time: 2 hrs**

**Marks: 50**

**Major Question**

12 marks

Q1. Estimation of Dissolved oxygen from the given water sample

OR

Q1. Detection of Creatinine in urine

OR

Q1. Determination of blood sugar by GOD and POD method

**Minor Question**

08 marks

Q2. Estimation of Salinity by refractometer from the given water sample

OR

Q2. Estimation of conductivity by conductometer from the given water sample

OR

Q2. Determination of blood pressure by using sphygmomanometer

OR

Q2. Study of bleeding time and clotting time

Q3. Identify and describe as per instructions

15 marks

1. Permanent slides (a &b)

2. Fishery (c ,d & e)

Q4. Field Report and viva based on it.

10 marks

Q5. Journal

05 marks

**UNIVERSITY OF MUMBAI**

No. UG/ 81 of 2018-19

**CIRCULAR:-**

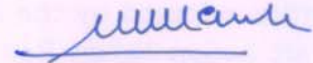
Attention of the Principals of the Affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty is invited to this office circular No. UG/331 of 2011, dated 1<sup>st</sup> October, 2011 relating to syllabus of Bachelor of Arts.

They are hereby informed that the recommendations made by the Board of Studies in Logic and Philosophy at its meeting held on 21<sup>st</sup> April, 2018 have been accepted by the Academic Council at its meeting held on 14<sup>th</sup> June, 2018 **vide** item No. 4.9 and that in accordance therewith, the revised syllabus as per the (CBCS) for the F.Y.B.A. in Philosophy – Sem-I and II has been brought into force with effect from the academic year 2018-19, accordingly. (The same is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032

13<sup>th</sup> June, 2018

To July



(Dr. Dinesh Kamble)

I/c REGISTRAR

The Principals of the affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty. (Circular No. UG/334 of 2017-18 dated 9<sup>th</sup> January, 2018.)

**A.C./4.9/14/06/2018**

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No. UG/ 81 -A of 2018

MUMBAI-400 032

13<sup>th</sup> July  
June, 2018

Copy forwarded with Compliments for information to:-

- 1) The I/c Dean, Faculty of Humanities,
- 2) The Chairman, Board of Studies in Logic and Philosophy,
- 3) The Director, Board of Examinations and Evaluation,
- 4) The Director, Board of Students Development,
- 5) The Professor-cum-Director, Institute of Distance and Open Learning (IDOL),
- 6) The Co-Ordinator, University Computerization Centre,



(Dr. Dinesh Kamble)

I/c REGISTRAR

**FYBA Philosophy (2018-19)**  
**Course Title: Moral Philosophy**  
**Paper No. 1**  
**Credits: 04**  
**No. of lectures: 60**  
**Marks: 100**

**The overall objectives of the course are as follows:**

1. Familiarize students with significant contributions from the history of moral philosophy
2. Inculcate in students a sense of moral reasoning based on analytical reasoning rather than on dogmatic assertion
3. Provide students with an ethical framework for assessing moral decisions in different areas of life.
4. Encourage students to appreciate the relevance of different moral cultures and outlooks in a globalized world

### **Semester 1 (UAPHI 101)**

#### **Unit 1: Introduction to Moral Philosophy (15 lectures)**

- (a) Definition, nature and scope (branches) of philosophy
- (b) Nature of moral philosophy (facts and values; intrinsic and extrinsic values) and areas of ethics (descriptive ethics, normative ethics, meta-ethics and applied ethics)
- (c) Ethical Relativism: arguments defending this position; critical evaluation

#### **Unit 2: Moral concepts in Indian Philosophy (15 lectures)**

- (a) Concepts of *Rta*, *Rna*, and *purushartha*
- (b) Philosophy of non-attachment (*nishkama karma yoga*)
- (b) *Sthitaprajna*: the moral ideal

#### **Unit 3: The Good Life: Greek Ethics (15 lectures)**

- (a) Socratic Ethics: virtue is knowledge; can ethics be taught?
- (b) The Four Virtues: Plato (in the context of *Republic*)
- (c) Ethics of Character: Aristotle

#### **Unit 4: Freedom and Determinism (15 lectures)**

- (a) Determinism: types of determinism: scientific determinism, religious determinism (i.e. predestination) and fatalism; critical appraisal of determinism
- (b) Indeterminism (i.e. libertarianism): arguments in support of free will; agency theory of freedom; critical appraisal of indeterminism
- (c) Compatibilism: reconciling determinism and freedom

### **Semester 1 End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

### **Reference and reading list recommended for the course**

- I. C. Sharma. *Ethical Philosophies of India* (New York: Harper and Row, 1965)
- Pradeep Gokhale and S. Bhelke *Studies in Indian Moral Philosophy: Problems, Concepts, and Perspectives* (Pune: Indian Philosophical Quarterly, 2002)
- Jacques Thiroux, *Ethics: Theory and Practice*
- James Cornman, Keith Lehrer and George Pappas. *Philosophical Problems and Arguments: An Introduction*
- James Fieser and Norman Lillegard, *Philosophical Questions: Reading and Interactive Guides* (New York/Oxford: OUP, 2005)
- KedarNath Tiwari, *Classical Indian Ethical Thought* (Motilal Banarasidas, 1998)
- William Frankena. *Ethics* (Prentice Hall, 1973)
- William Lawhead. *The Philosophical Journey: An Interactive Approach* (Mayfield Publishing Company, 2000)

## **Semester 2 (UAPHI 201)**

### **Unit 1: Morality of Self-interest (15 lectures)**

- (a) Hedonistic Egoism: Epicurus
- (b) Psychological Egoism: Thomas Hobbes
- (c) Ethical Egoism: Ayn Rand

### **Unit 2: Modern Ethical Theories (15 lectures)**

- (a) Ethics of altruism: David Hume: nature and origin of morality: sentiment (sympathy) versus reason; Virtues: artificial and natural
- (b) Deontological Ethics: Immanuel Kant: Categorical Imperative: formula of Universal law and formula of End-in-itself, critical appraisal.
- (c) Utilitarianism: John Stuart Mill: Critique of Jeremy Bentham's view; Greatest Happiness principle, higher and lower pleasures, two sanctions, critical appraisal.

### **Unit 3: Alternative Ethical Theories (15 lectures)**

- (a) Augustinian Ethics: Happiness and Virtue, love of God and neighbour
- (b) Existentialist Ethics: Jean Paul Sartre (existence precedes essence, anguish and abandonment, bad faith)
- (c) Feminist Ethics: Ethics of Care: Carol Gilligan (against the backdrop of Lawrence Kohlberg's 'Stages of Moral Development')

**Unit 4: Theories of Punishment (15 lectures)**

- (a) Retributive theory, critical appraisal
- (b) Deterrent theory and reformative approach to punishment; critical appraisal
- (c) Capital punishment: retentionists versus abolitionists

**Semester 2 End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be a Short Note (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

**Reference and reading list recommended for the course:**

----- Ayn Rand, *The Virtue of Selfishness* [Introduction, chpts. 1 and 3] (New York: Signet Book, 1964)

----- H.B. Acton (ed.), *The Philosophy of Punishment* (Macmillan, 1969)

----- James Fieser and Norman Lillegard, *Philosophical Questions: Reading and Interactive Guides* (New York and Oxford: OUP, 2005)

----- James McGlynn & Jules Toner, *Modern Ethical Theories* (New York: Bruce Publishing Company, 1962)

----- Jean Paul Sartre, "Existentialism is a Humanism" in Walter Kaufman (ed.), *Existentialism from Dostoyevsky to Sartre* (New American Library -Meridian Book, 1975)

----- Jeffery Olen and Vincent Barry, *Applying Ethics* (Wadsworth, 1998)

----- Neil Levy, *Sartre* (Oneworld Publications, 2007)

----- Richard Norman, *The Moral Philosophers: An Introduction to Ethics* (Oxford: Clarendon Press, 1983)

----- Ted Honderich, *Punishment: The Supposed Justifications* (Penguin Books, 1969)

----- William Lawhead, *The Philosophical Journey: An Interactive Approach* (Mayfield Publishing Company, 2000)

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**UNIVERSITY OF MUMBAI**

No. UG/101 of 2018-19

**CIRCULAR:-**

Attention of the Principals of the Affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty is invited to this office circular No. UG/62 of 2017-18, dated 18<sup>th</sup> July, 2017 relating to syllabus of S.Y.B.A. in Philosophy.

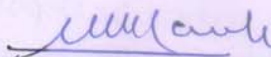
Their attention is also invited to University Circular No. UG/165 of 2011 dated 20<sup>th</sup> June, 2011 for F.Y.B.A. in Philosophy (Sem. I & II).

They are hereby informed that the recommendations made by the Board of Studies in Logic and Philosophy at its meeting held on 21<sup>st</sup> April, 2018 have been accepted by the Academic Council at its meeting held on 14<sup>th</sup> June, 2018 **vide** item No. 4.10 and that in accordance therewith, the revised syllabus as per the (CBCS) for the S.Y.B.A. in Philosophy – Sem. III & IV has been brought into force with effect from the academic year 2018-19, accordingly. (The same is available on the University's website [www.mu.ac.in](http://www.mu.ac.in)).

MUMBAI – 400 032

21<sup>st</sup> August, 2018

To

  
(Dr. Dinesh Kamble)  
I/c REGISTRAR

The Principals of the affiliated Colleges and Directors of the recognized Institutions in Humanities Faculty. (Circular No. UG/334 of 2017-18 dated 9<sup>th</sup> January, 2018.)s

**A.C./4.10/14/06/2018**

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No. UG/101 -A of 2018

MUMBAI-400 032

21<sup>st</sup> August, 2018

Copy forwarded with Compliments for information to:-

- 1) The I/c Dean, Faculty of Humanities,
- 2) The Chairman, Board of Studies in Logic and Philosophy,
- 3) The Director, Board of Examinations and Evaluation,
- 4) The Director, Board of Students Development,
- 5) The Professor-cum-Director, Institute of Distance and Open Learning (IDOL),
- 6) The Co-Ordinator, University Computerization Centre,

  
(Dr. Dinesh Kamble)  
I/c REGISTRAR



## **SYBA Philosophy (2018-19)**

**Course Title: Social Political Philosophy**

**Paper No. 2**

**Credits: 3**

**Total Lectures: 45**

**Marks: 100**

**The overall objectives of the course are as follows:**

1. To acquaint students with the basic philosophical questions and issues that are current in social and political philosophy
2. To equip students with argumentative and analytical skills involved in philosophizing through these issues
3. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical ideas and perspectives

### **Semester 3: Social Philosophy (UAPHI-301)**

#### **Unit I Family and Gender Issues (11 Lectures)**

Perspectives on family & marriage: (i) Plato's perspective on marriage and family (ii) Bertrand Russell's perspective on marriage and family. Contemporary trends in family and marriage: (i) single parent families, (ii) live – in relationships, (iii) same-sex marriages. Gender as a construct: (i) Feminism (Simon de Beauvoir) and (ii) Masculinity.

#### **Unit II Social Awareness (11 Lectures)**

Economic discrimination: (i) Gandhi's notion of trusteeship and (ii) critique of capitalism; class discrimination: (i) Marx's theory of alienation (of proletariat) and (ii) class conflict-bourgeois and proletariat; racial Discrimination: (i) Frantz Fanon's psycho-analysis of racism and (ii) dialectics of recognition(Hegel); caste discrimination: (i) Ambedkar's account of the problem of caste discrimination and (ii) Ambedkar's response to it

#### **Unit III Just War and Pacifism (11 Lectures)**

Just War Theory: (i) Justice of War (*jus ad bellum*) (ii) Justice in war (*jus in bello*), (iii) Justice after war (*jus post bellum*); types of pacifism.

#### **Unit IV Engaging Diversity (12 Lectures)**

Philosophical perspective on multiculturalism: Bhikhu Parekh; critique of multiculturalism - Brian Barry; rights of refugees and rights of immigrants – Michael Dummett; Orientalism- Post-colonial critique of the European representation of the Orient-Edward Said

#### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

## References and reading list recommended for the course:

### Unit I

Bertrand Russell *Marriage and Morals* Routledge Publications, 1985

Deborah Satz "Feminist Perspectives on Reproduction and the Family" *Stanford Encyclopedia of Philosophy* 2013 (on line <https://plato.stanford.edu/entries/feminism-family/>)

Barrie Thorne "Feminist Rethinking of the Family: An Overview" *Rethinking the Family: Some Feminist Questions* ed. Barrie Thorne and Marilyn Yalom Longman: New York and London, 1982

Simone de Beauvoir "Introduction" *The Second Sex* (a new translation by Constance Borde and Sheila Malovany-Chevallier) Vintage: London, 2009

Jack Sawyer "On Male Liberation" in *Feminism and Masculinities* ed. Peter Murphy OUP, Oxford 2004

Todd Reeser, *Masculinities in Theory: An Introduction* chapter 1

John Beynon, *Masculinities and Culture* chapter 1

### Unit II

M.K. Gandhi. *Trusteeship* Navjeevan Publication, 1990

K. Kripalani *All men are brothers*, Chapter- Poverty in the midst of plenty- Navjeevan Publication 1960

Franz Fanon "The Fact of Blackness" *Black Skin White Masks*-Grove Press 1967

John Elster, *An Introduction to Karl Marx* chapter 3 and 7

Karl Marx and Friedrich Engels *A Manifesto of the Communist Party* 1848  
<https://www.marxists.org/archive/marx/works/download/pdf/Manifesto.pdf>

B.R. Ambedkar "Annihilation of Caste" in *Dr. Babasaheb Ambedkar: Writings and Speeches*, Vol. 1. Bombay: Education Department, Government of Maharashtra, 1979

B.R. Ambedkar "On the way to Goregaon" in *The Essential Writings of B.R. Ambedkar* ed. Valerian Rodrigues OUP, Oxford: 2002

\_\_\_\_\_ "Who were the Shudras?" in *The Essential Writings of B.R. Ambedkar* ed. Valerian Rodrigues OUP, Oxford: 2002

### Unit III

Nicholas Fotion *War and Ethics: a New Just War Theory* (Continuum, 2007)

Colin Bird, *Introduction to Political Philosophy* chapter 10

Catriona McKinnon, *Issues in Political Theory*, chapter 3

*Stanford Encyclopedia of Philosophy* (on line source) readings on war and pacificism.

### Unit IV

Charles Taylor "The Politics of Recognition" in Colin Farrelly (ed) *Contemporary Political Theory: A Reader* (Sage Publishers, 2004)

Bhiku Parekh. "Equality of Difference" in Colin Farrelly (ed) *Contemporary Political Theory: A Reader* (Sage Publishers, 2004)

Brian Barry, "Liberalism and Multiculturalism" in *Ethics*

George Crowder, *Theories of Multiculturalism: An Introduction*, chapter 3

Bill Ashcroft and Pal Ahluwalia, *Edward said* (Routledge Critical Thinkers Series) chapter 3.

Moustafa Bayoumi and Andrew Rubin (ed.) *The Edward Said Reader* chapter 4.

Michael Dummett *Immigration and Refugees* Routledge London and New York, 2001 (chapters 1-5)

## **Semester 4: Political Philosophy (UAPHI-402)**

### **Unit I: Political ideologies (11 Lectures)**

Characteristics of (i) Liberalism (ii) socialism (iii) Anarchism (iv) Totalitarianism, (v) Cosmopolitanism (vi) Nationalism

### **Unit II: Liberty (11 Lectures)**

Isaiah Berlin: Negative and Positive liberty; Thomas Hobbes: negative liberty; Jacques Rousseau: positive liberty; Third Concept of Liberty: Republican Theory of Liberty (liberty as non-domination); right to dissent and civil disobedience – Martin Luther King

### **Unit III Equality (11 Lectures)**

Types of equality: (i) Numerical (ii) Proportional and (iii) Moral; Ronald Dworkin's view on the equality of resources; Gandhi: Sarvodaya (universal welfare)

### **Unit IV Justice (12 Lectures)**

Justice as preservation: Plato; Justice as entitlement: Robert Nozick; Justice as fairness: John Rawls; Social justice: B. Ambedkar.

### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

### **References and reading list recommended for the course:**

#### **Unit 1.**

Robert Goodman, Philip Pettit and Thomas Pogge *A Companion to Contemporary Political Philosophy* Blackwell: 2007 ( 2 volumes)

Baradat, Leon. *Political Ideologies: their origins and impact* (Pearson-Prentice Hall, 2008)

Bird, Colin. *An Introduction to Political Philosophy* (Cambridge University Press, 2006)

Heywood, Andrew. *Political Theory: An Introduction* (Palgrave Macmillan, 2012/13)

Knowles, Dudley. *Political Philosophy* (London: Routledge, 2001)

#### **Unit 2.**

David Miller ed. *The Liberty Reader* Routledge 2006 : Readings from the above text as follows: (a)Two Concepts of Liberty by Isaiah Berlin (b) Negative and Positive Freedom by Gerald C. MacCallum, Jr. (c)*The Republican Ideal of Freedom* by Philip Pettit (d) *A Third Concept of Liberty* by Quentin Skinner

Martin Luther King. "Letter from Birmingham Jail"  
[https://web.cn.edu/kwheeler/documents/Letter\\_Birmingham\\_Jail.pdf](https://web.cn.edu/kwheeler/documents/Letter_Birmingham_Jail.pdf) 1963

#### **Unit 3.**

Stephan Goosepath "Equality" in *Stanford Encyclopedia of Philosophy*

<https://plato.stanford.edu/entries/equality/> 2007

Raymond Plant *Modern Political Thought* Wiley Blackwell 1991 (chapter on Dworkin)

Ronald Dworkin "What is Equality? Part 1: Equality of Welfare" *Philosophy & Public Affairs*, 10 (3) (Summer, 1981), pp. 185-246

Ronald Dworkin "What is Equality? Part 2: Equality of Resources" *Philosophy & Public Affairs*, Vol. 10, No. 4 (Autumn, 1981), pp. 283-345

M.K. Gandhi *Autobiography: Story of My Experiments with Truth* (relevant discussion on Sarvodaya) Navjivan Publishing House: Ahmedabad

\_\_\_\_\_'Hind Swaraj' and Other Writings (Cambridge Texts in Modern Politics) ed. Anthony Parel, CUP: Cambridge 2010 edition)

\_\_\_\_\_*Village Swaraj* compiled H.M. Vyas Navjivan Publishing House: Ahmedabad, 1962

Ganesh Prasad "Sarvodaya—A Critical Study" *The Indian Journal of Political Science* Vol. 21, No. 1 (January—March, 1960), pp. 38-61

#### **Unit 4.**

Julian Lamont "Distributive Justice" *Stanford Encyclopedia of Philosophy*

Robert Nozick *Anarchy, State and Utopia*, New York: Basic Books, 1974 (chapter 7)

John Rawls *A Theory of Justice*, Cambridge, MA Harvard University Press, 1971 (chapter 1 and chapter 2)

Raymond Plant *Modern Political Thought* Wiley Blackwell 1991 (Relevant chapters)

Plato, *Republic* New Haven: Yale University Press, 2006 (Book 1)

B.R. Ambedkar "Annihilation of Caste" in *Dr. Babasaheb Ambedkar: Writings and Speeches*, Vol. 1. Bombay: Education Department, Government of Maharashtra, 1979, pp. 25-96. (also available online)

B.R. Ambedkar "Buddha and His Dhamma"

Arun P. Mukherjee "B.R. Ambedkar, John Dewey, and the Meaning of Democracy" *New Literary History* (2009) 40 (2): 345-370

Valerian Rodrigues "Ambedkar on Preferential Treatment" *Seminar* (2005), 549, pp 55-61.

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**SYBA Philosophy (2017-18)**  
**Course Title: Indian-Western Philosophy**  
**Paper No. 3**  
**Credits: 3**  
**Total Lectures: 45**  
**Marks: 100**

### **Semester 3: Indian Philosophy (UAPHI 302)**

**The OBJECTIVES of the course on Indian philosophy are:**

1. To acquaint students with the basic philosophical questions that philosophers in India have addressed.
2. To equip students with argumentative and analytical skills involved in philosophical reasoning.
3. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical systems and perspectives.

#### **Unit 1. Introduction to Indian Philosophy (12 lectures)**

Vedic Cosmology, Upanishadic philosophy (Brahman, atman and world), various classifications of schools of Indian Philosophy, Introduction to six Darsanas (General features of the Darsanas)

#### **Unit 2 Carvaka Philosophy (11 lectures)**

Denial self, liberation and God, perception as the only valid source of knowledge, Rejection of inference and testimony, Hedonism

#### **Unit 3. Jaina philosophy (11 lectures)**

Classification of reality, *Syadavada*, *anekantavada*, *Triratnas*; *Anuvrata* and *Mahavrata*

#### **Unit 4. Buddhist philosophy (11 lectures)**

Four-Noble Truths, Theory of No-Self (*anatmavada*), *Kshanikavada*

#### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

#### **References and reading list recommended for the course**

Bishop, Donald (ed.) *Indian Thought: An Introduction* (New Delhi: Wiley Eastern Private Ltd., 1975)

Chattopadhyay D.P., *Lokayata: A Study in Ancient Indian Materialism* (people's Publishing House; Third edition (2006)

Deussen, Paul. *Outlines of Indian Philosophy* (New Delhi: Crest Publishing House, 1996)  
 Gethin, Rupert. *The Foundations of Buddhism* (Oxford University Press, 1998)  
 Glasenapp, Helmuth Von. *Jainism: An Indian Religion of Salvation* (Delhi: Motilal Banarasidas Publishers, 1998)  
 Gokhale, Pradeep P. *Lokayata/Carvaka* OUP, New Delhi, 2015  
 Nagin shah. *Jaina philosophy and religion*, Motilal Banarsidass, (2001)  
 Hiriyanna, M. *Outlines of Indian Philosophy* (Delhi: Motilal Banarasidas, 1993)  
 Humphreys, Christmas. *The Buddhist Way of Life* (New Delhi: Indus Publishers, 1993)  
 Raju, T. *The Philosophical Traditions of India* (London: George Allen & Unwin Ltd., 1971)  
 Sangharakshita. *The Essential Teachings of the Buddha* (New Delhi: New Age Books, 2000)  
 Shah Nathubhai. *Jainism: The World of Conquerors* (Delhi: Motilal Banarasidas Publishers, 1999)  
 Srinivasachari, P.N. *Ethical Philosophy of the Gita* (Madras: SriRamakrishna Matt, 2001)

## **Semester 4: Western Philosophy (UAPHI 402)**

### **The objectives of the course are:**

1. To acquaint students with the basic philosophical questions that philosophers in the Greek and medieval tradition have addressed.
2. To equip students with argumentative and analytical skills involved in philosophical reasoning.
3. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical systems and perspectives.

### **Unit- 1 Pre-Socratics and sophists (11 lectures)**

Natural philosophers (Thales, Anaximander and Anaximenes), the problem of change (Parmenides and Heraclites), Pluralists (Democritus), Sophists (Protagoras)

### **Unit- 2. Socrates and Plato (11 lectures)**

Characteristics of Socratic method, Plato's theory of knowledge (Simile of Divided Line and Allegory of cave), criticisms against sense perception, Characteristics of Forms/Ideas

### **Unit- 3 Aristotle and Post-Aristotle (11 lectures)**

Aristotle's theory of Causation (reference to the notion of teleology), Form and Matter; actuality and potentiality, Stoicism (Epictetus), Skepticism (Sextus Empiricus)

### **Unit- 4. Medieval Philosophy (12 lectures)**

Peter Abelard (Relationship between reason and faith), Characteristics of the Schools of Mu'tazilites and Asharites, Moses Maimonides (Philosophy and Theology)

### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units

3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

**References and reading list recommended for the course**

Annas, Julia. *Ancient Philosophy: A Very Short Introduction* (Oxford University Press, 2000)

Barnes, Jonathan. *Early Greek Philosophy*, (Penguin; Revised edition 2002)

Elrouayheb K, SChmidtke S, Oxford handbook of Islamic Philosophy, Oxford University Press, 2017

G. S. Kirk and J. E. Raven. *The Pre-Socratic Philosophers*. (Cambridge University Press, 1957)

Grube, G. M. *Plato's Thought* (London: Methuen, 1935)

Guthrie, W. K. C. 1962, 1965, 1969, *A History of Greek Philosophy*, Vols. I, II, and III, IV, V, VI (Cambridge University Press. 1962, 1965, 1969)

Jones, W.T. *A History of Western Philosophy: The Medieval Mind* (Harcourt, Brace and World, Inc. 1969)

Michael Marmura, Etienne Gilson. *'Al Ghazali, The incoherence of the Philosophers'*(University of Chicago Press 1998)

Osborne, Catherine. 2004 *Pre-Socratic Philosophy: A Very Short Introduction* (Oxford University Press 2004)

Stace, W.T. *A Critical History of Greek Philosophy* (Macmillan, 1985, 1992)

Stumpf, S.E. & Fieser, J. *Philosophy: History and Problems* (McGraw-Hill, 1971)

Walsh, Martin *A History of Philosophy* (London: Geoffrey Chapman, 1985)

Frederick Copleston *A History of Philosophy* (volumes 1, 2, 3) Image 1993

D.J. O'Connor *Critical History of Western Philosophy* Free Press, 1985

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## **SYBA Philosophy (2017-18)**

**Course Title: Comparative Religions (Applied Component)**

**Credits: 02**

**Total Lectures: 60**

**Marks: 100**

### **Semester 3 (UACR- 301)**

**The objectives of the paper on study of major world religions are:**

1. To arrive at an informed understanding of the diversity and complexity of World Religions
2. To develop religious sensitivity necessary to understand the contemporary world
3. Through this understanding to lay the foundations for inter-faith dialogue, necessary for peace and harmony in the society.

#### **Unit- 1 : Zoroastrianism (15 lectures)**

Beginnings of the Prophetic and monotheistic tradition. Foundation, rise and spread with reference to geography and cultural milieu. Fundamental belief system—Ahura Mazda and Angra Mainyu in opposition, Spiritual and Material World, Man, Evil, Eschatology. Practices—Ritual purity, Prayer, Worship, Rituals, Rites of Passage, Unique disposal of the dead and Ecology. Festivals and their significance. Calendar. Canon. Zoroastrianism in confluence and divergence with other World Religions.

#### **Unit- 2 Judaism (15 lectures)**

The Abrahamic tradition. Foundation, rise and spread with reference to geography and cultural milieu. Significance of the Covenants with Abraham and Moses. Fundamental belief system-- God, Man, Creation, Evil, Eschatology. Practices-- Prayer, Worship, Rituals, Rites of Passage, Observance of the Sabbath and Kosher. Festivals and their significance. Calendar. Canon, Judaism in confluence and divergence with other World Religions.

#### **Unit- 3 Christianity (15 lectures)**

Continuing the Abrahamic tradition—the new covenant. Foundation, rise and spread with reference to geography and cultural milieu. Life and teachings of Jesus Christ, the apostolic tradition. The development of Christian Theology – The concepts of Trinity, Original Sin, Crucifixion and Redemption. Evil, Eschatology. Practices--Prayer, Worship, Rituals, Sacraments, Festivals and their significance. Calendar. Canon, Christianity in confluence and divergence with other World Religions.

#### **Unit- 4 Islam (15 lectures)**

The place of Abraham in Islam. Socio-political conditions in Pre-Islamic Arabia and the age of jahiliyya. Prophethood and the continuing tradition with other Abrahamic faiths. The life of the Prophet. Foundation, rise and spread with reference to geography and cultural milieu. Fundamental belief system—Tauhid,



Rasul, Kutub, Qiyamat. Practices—the five pillars of Islam, transactions: nikah, talaq, virasat, Mystical tradition-Sufism. Festivals and their significance. The two Jihads. Calendar. Canon. Islam in confluence and divergence with other World Religions.

### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

## **Semester 4 (UACR- 401)**

### **Unit- 1 : Hinduism (15 lectures)**

Debates on constructing the category “Hinduism”, Pre-Vedic religions, origin and antiquity of the Vedas; Vedic Texts (Shruti and Smriti), an introduction to later Vedic scriptures (Brahmanas and Aranyakas). , The emergence and development of the Upanishads, fundamental concepts of Classical Hinduism: Brahman-atman, karma, moksha, and samsara; Epic literature: Mahabharata and Ramayana; the place of the Bhagwad Gita, the early and late Puranas. Classical Hindu Society; the Dharma Shastras-corpus, classification and content; varna-asharma dharma and the four goals of life (purusharthas); the three paths to salvation. Philosophical worldviews (darshanas) Bhakti Tradition. Religious Expressions (Puja, Vrata, Tirtha). Festivals and their significance. Calendar. Hinduism in confluence and divergence with other World Religions.

### **Unit- 2: Buddhism (15 lectures)**

Shramana tradition/ Nastik Darshana Genesis of Early Buddhism: Socio-historical roots, cultural milieu of the rise of early Buddhism and ideological setting; Buddhism as a protest movement? Spread of Buddhism and causes for its decline in India. 20<sup>th</sup> century. Fundamental Buddhist Thoughts: The Four Noble Truths; The Eight Fold Path (Astamârga), Dependent Origination; philosophy of Non-self (anattâ/anâtman). Concept of nirvâna; Karma/kamma and rebirth and its divergence with the Jaina and Brahmanical notions of karma. Festivals and their significance. Canon. Buddhism in confluence and divergence with other World Religions.

### **Unit- 3: Jainism (15 lectures)**

Shramana tradition/ Nastik Darshana. Genesis of Jainism: Socio-historical roots, cultural milieu of the rise of early Jainism and ideological setting; Jainism as a protest movement? The world, Karma and rebirth, the soul. The triratnas, mahavratas and anuvratas. Special place of ahimsa. Fast, worship, pilgrimage. Festivals and their significance. Canon. Jainism in confluence and divergence with other World Religions

### **Unit 4: Sikhism (15 lectures)**

Sikhism as a syncretic religion. Socio cultural roots. Foundation and spread. Nanak and the Guru tradition. The practice. Simran, Seva, The formation of the Khalsa, Sangat, Langar Dasvandh. 5 Ks, concept of haumia, liberation, three core values: naam japna, kirt karna, wand chakkna. The ascetic path. Festivals and their significance. Canon. Sikhism in confluence and divergence with other World Religions

**Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

**References and reading list recommended for the course.**

Breuilly, Elizabeth, Joan O'Brien and Martin Palmer. *Religions of the World: The Illustrated Guide to Origins, Beliefs, Traditions & Festivals*. Checkmark Books. 2005

Burke, T. Patrick. *The Major Religions*. Cambridge, MA: Blackwell Publishers. 1996

Eastman Roger. *The Ways of Religion*. Oxford 1993

Hinnells, John Red. *A New Dictionary of Religions*. Cambridge, MA: Blackwell Publishers. 1997

Hinnells, John Red. *A New Handbook of Living Religions*. Cambridge, MA: Blackwell Publishers. 1997

Hopfe, Lewis M. *Religions of the World*. (6th Ed). New York: Macmillan College Publishing. 1994

Markham, Ian S (ed.). *A World Religions Reader*. Cambridge, MA: Blackwell Publishers. 1996

Masih, Y. *A Comparative Study of Religions*. Delhi: Motilal Banarsidass. 2010

Matthews, Warren. *World Religions*. St. Paul, MN: West Publishing Company. 1991

Muhyaddin, M. A. *A Comparative Study of the Religions of Today*. Vantage Press. 1984.

Paden E., William. *Religious Worlds: The Comparative Study of Religion*. Beacon Press. 1994

Radhakrishnan, S. *Eastern Religions and Western Thought*. Oxford: Oxford University Press. 1990

Schade, Johannes P. (ch. ed). *Encyclopedia of World Religions*. Concord Publishing. 2006

Smith, Huston. *Forgotten Truth: The Common Vision of the World's Religions*. Harper-One. 2009

Smith, Huston. *The World's Religions* (ed. 2) HarperCollins. 2009

Tiwari, K.N. *Comparative Religion*. Delhi: Motilal Banarsidass. 1983

Zaehner, R.C.(ed.) *The Concise Encyclopedia of Living Faiths*. Boston, MA: Beacon Press. 1959

A Lion Handbook- The World Religions- Lion Publishing, 1992 .

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**SYBA Philosophy (2017-18)**  
**Course Title: Gandhism (Applied Component)**  
**Credits: 02**  
**Total Lectures: 60**  
**Marks: 100**

### **Semester 3 (UACR 301)**

#### **Unit I: Impact of different religions on M.K. Gandhi (15 Lectures)**

- 1) Hindu Religion/ Hinduism
- 2) Jain Religion/ Jainism
- 3) Buddha Religion/ Buddhism
- 4) Christian Religion/ Christianity, Islam

#### **Unit II: Impact of thinkers on M.K. Gandhi (15 Lectures)**

- 1) Leo Tolstoy
- 2) John Ruskin
- 3) Srimad Rajchandra
- 4) Gopal Krishna Gokhale

#### **Unit III: Fundamental principles of Gandhian Philosophy (15 Lectures)**

- 1) Truth
- 2) Non-violence
- 3) Means - Ends Relationship
- 4) Swadeshi

#### **Unit IV Gandhi's social concepts (15 Lectures)**

- 1) M.K. Gandhi's views on women
- 2) Removal of untouchability
- 3) Pune pact

#### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

#### **Reading List recommended for the course**

Bikhu Parekh. *Gandhi: A Very Short Introduction*. Oxford University Press, New York. 1997.  
Das Gupta, A. K. Gandhi on Social Conflict. *Economic and Political Weekly*, Vol. 3, No. 39, (Dec. 7, 1968), pp. 1876-1878. <http://www.jstor.org/stable/4359414>.  
Gandhi M.K. *What Jesus means to Me*, Navajivan Trust. 1959,

Gandhi, M.K, *The Collected Works of Mahatma Gandhi*, (relevent volumes), New Delhi  
Delhi: Publication Division, Ministry of Information and Broadcasting, Government of  
India, 1958-1994

Gandhi M.K. *My God*. Compiled by R.K Prabhu. Navajivan Publishing House, Ahmedabad,  
India. 1962.

## **Semester 4 (UACR 401)**

### **Unit I: Gandhi's Political concepts (15 Lectures)**

- 1) Nationalism
- 2) Ramrajya
- 3) Satyagraha

### **Unit II: Gandhi's views on education (15 Lectures)**

- 1) Basic Education: Aims of education
- 2) Gandhi's views on education for women
- 3) Adult education
- 4) Gandhi's emphasis on education in mother tongue

### **Unit III: Gandhi's perspectives on economics (15 Lectures)**

- 1) Machine culture
- 2) Economic Planning
- 3) Village Industries, Khadi
- 4) Trusteeship

### **Unit IV: Gandhian Philosophy in present context (15 Lectures)**

- 1) Sarvodaya - Bhoodan Movement – Vinoba Bhave
- 2) Civil Rights movement – Martin Luther King
- 3) M. K. Gandhi's contribution to Indian Constitution
- 4) The relevance of Gandhian Philosophy to Environmental Ethics

### **Semester End Exam Evaluation [100 marks]**

1. There shall be five compulsory questions
2. First four questions shall correspond to the four units
3. Question 5 shall be Short Notes (one from each unit and attempt any 2 of 4)
4. All questions shall contain internal choice
5. Each question shall carry a maximum of 20 marks

### **Reading List recommended for the course**

Bikhu Parekh. *Gandhi: A Very Short Introduction*. Oxford University Press, New York. 1997.

Das Gupta, A. K. Gandhi on Social Conflict. *Economic and Political Weekly*, Vol. 3, No. 39,  
(Dec. 7, 1968), pp. 1876-1878. <http://www.jstor.org/stable/4359414>.

Gandhi M.K, *An Autobiography or The Story of my Experiments with Truth*. Navajivan  
Publishing House Ahmedabad, India. 1927.

Gandhi M.K. *Ruskin Unto His Last; A paraphrase*. Navajivan Trust, 1956.  
Gandhi, M.K, *Truth is God*. Compiled by R.K Prabhu, Navajivan Publishing House,  
Ahmedabad, India. 1955.

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