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# B.P. CHALIHA COLLEGE

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## CRITERIA: I

### Curricular Aspects

**1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum**



Submitted to



**National Assessment and Accreditation Council**

**1.3.1: Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum**

**Session 2018-19**

**B.P. Chaliha College  
Nagarbera, Assam  
CRITERIA: I  
Curricular Aspects  
Key indicator 1.3 Curriculum Enrichment  
Department of Economics**

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	M 503	Introduction to Environmental Economics	2018-19	This paper begins with the nature and scope of Environmental Economics. The nature of public goods leading to market failure, Environment as a public good, externalities and tragedy of commons are also included in this paper. Various environmental policies for Environmental protection are to be discussed and the paper ends with discussion of various emerging serious global issues like climate change.
2	M 603	Economics of Natural Resources and Sustainable Development		This paper includes study of environmental resources, their types and characteristics. The condition for optimal depletion of non-renewable resources, role of backstop. Economically optimal rate of harvest for renewable resources, trade-off between economic development and environment and need of sustainable development are studied in this paper.

**FIFTH SEMESTER**  
**M 503 INTRODUCTION TO ENVIRONMENTAL ECONOMICS**

**Total Marks :75**

Total Credit:6 (Total Number of Classes:72)

Time:3 hours

**Unit 1:** Nature and scope of environmental economics, Economy-environment interaction

**Unit 2:** Market failure, externality, public good-Environment as a public good, Tragedy of Commons

**Unit 3:** Environmental Kuznets's Curve, Pollution Control Policies: Command and control approach, Incentive based approach: Taxes, Liability Law and tradeable permits

**Unit 4:** Global Environmental Issues: Climate Change – Implications and Mitigation

**Recommended Readings:**

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP
2. R Bhattacharjee, Environmental Economics, OUP

**SIXTH SEMESTER**  
**M 603 ECONOMICS OF NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT**

**Total Marks :75**

Total Credit:6 (Total Number of Classes:72)

Time:3 hours

**Unit 1:** Natural Resources: Types and Characteristics

**Unit 2:** Economics of Non-renewable Resources: Conditions for optimal depletion, Market forms and rate of depletion, Role of a backstop

**Unit 3:** Economics of Renewable Resources: The Idea of sustainable yield, economically optimal rate of harvest

**Unit 4:** Development-environment Trade-off, Sustainable development- Indicators and policy issues – Integrated economic and environmental accounting

Books Suggested:

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP

2. R Bhattacharjee, Environmental Economics, OUP

**Session 2019-20**

<b>B.P. Chaliha College Nagarbera, Assam CRITERIA: I Curricular Aspects Key indicator 1.3 Curriculum Enrichment</b>				
1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum				
Sl. No.	Course Code	Course Name	Year	Course Description
1	M 503	Introduction to Environmental Economics	2019-20	This paper begins with the nature and scope of Environmental Economics. The nature of public goods leading to market failure, Environment as a public good, externalities and tragedy of commons are also included in this paper. Various environmental policies for Environmental protection are to be discussed and the paper ends with discussion of various emerging serious global issues like climate change.
2	M 603	Economics of Natural Resources and Sustainable Development		This paper includes study of environmental resources, their types and characteristics. The condition for optimal depletion of non-renewable resources, role of backstop. Economically optimal rate of harvest for renewable resources, trade-off between economic development and environment and need of sustainable development are studied in this paper.

**FIFTHSEMESTER**  
**M 503 INTRODUCTION TO ENVIRONMENTAL ECONOMICS**

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TotalCredit:6 (TotalNumberofClasses:72)

Time:3 hours

**Unit 1:** Nature and scope of environmental economics, Economy-environment interaction

**Unit 2:** Market failure, externality, public good-Environment as a public good, Tragedy of Commons

**Unit 3:** Environmental Kuznets's Curve, Pollution Control Policies: Command and control approach, Incentive based approach: Taxes, Liability Law and tradeable permits

**Unit 4:** Global Environmental Issues: Climate Change – Implications and Mitigation

**Recommended Readings:**

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP
2. R Bhattacharjee, Environmental Economics, OUP

**SIXTHSEMESTER**  
**M 603 ECONOMICS OF NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT**

**TotalMarks :75**

TotalCredit:6 (TotalNumberofClasses:72)

Time:3 hours

**Unit 1:** Natural Resources: Types and Characteristics

**Unit 2:** Economics of Non-renewable Resources: Conditions for optimal depletion, Market forms and rate of depletion, Role of a backstop

**Unit 3:** Economics of Renewable Resources: The Idea of sustainable yield, economically optimal rate of harvest

**Unit 4:** Development-environment Trade-off, Sustainable development- Indicators and policy issues – Integrated economic and environmental accounting

**BooksSuggested:**

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP

**Session 2020-21**

**B.P. Chaliha College  
Nagarbera, Assam  
CRITERIA: I  
Curricular Aspects  
Key indicator 1.3 Curriculum Enrichment**

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	M 503	Introduction to Environmental Economics	2020-21	This paper begins with the nature and scope of Environmental Economics. The nature of public goods leading to market failure, Environment as a public good, externalities and tragedy of commons are also included in this paper. Various environmental policies for Environmental protection are to be discussed and the paper ends with discussion of various emerging serious global issues like climate change.
2	M 603	Economics of Natural Resources and Sustainable Development		This paper includes study of environmental resources, their types and characteristics. The condition for optimal depletion of non-renewable resources, role of backstop. Economically optimal rate of harvest for renewable resources, trade-off between economic development and environment and need of sustainable development are studied in this paper.

**FIFTH SEMESTER**  
**M 503 INTRODUCTION TO ENVIRONMENTAL ECONOMICS**

**TotalMarks :75**

TotalCredit:6 (TotalNumberofClasses:72)

Time:3 hours

**Unit 1:** Nature and scope of environmental economics, Economy-environment interaction

**Unit 2:** Market failure, externality, public good-Environment as a public good, Tragedy of Commons

**Unit 3:** Environmental Kuznets's Curve, Pollution Control Policies: Command and control approach, Incentive based approach: Taxes, Liability Law and tradeable permits

**Unit 4:** Global Environmental Issues: Climate Change – Implications and Mitigation

**Recommended Readings:**

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP
2. R Bhattacharjee, Environmental Economics, OUP

**SIXTHSEMESTER**  
**M 603 ECONOMICS OF NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT**

**TotalMarks :75**

TotalCredit:6 (TotalNumberofClasses:72)

Time:3 hours

**Unit 1:** Natural Resources: Types and Characteristics

**Unit 2:** Economics of Non-renewable Resources: Conditions for optimal depletion, Market forms and rate of depletion, Role of a backstop

**Unit 3:** Economics of Renewable Resources: The Idea of sustainable yield, economically optimal rate of harvest

**Unit 4:** Development-environment Trade-off, Sustainable development- Indicators and policy issues – Integrated economic and environmental accounting

**Books Suggested:**

1. Hanley, Shrogram and White, Introduction to Environmental Economics, OUP

**Session 2021-22**

<b>B.P. Chaliha College Nagarbera, Assam CRITERIA: I Curricular Aspects Key indicator 1.3 Curriculum Enrichment</b>				
1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum				
Sl. No.	Course Code	Course Name	Year	Course Description
1	ECO-HC-6026	Development Economics-II	2021-22	This paper begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the problems of enforcement experienced in poor countries. The governance of communities and organizations is studied, and this is then linked to questions of sustainable growth.

**SIXTHSEMESTER**

**ECO-HC-6026: DEVELOPMENT ECONOMICS-II**

**Unit 4:** Environment and Sustainable Development Defining sustainability for renewable resources; a brief history of environmental change; common-pool resources; environmental externalities and state regulation of the environment; economic activity and climate change.

**Recommended Readings:**

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. Thomas Schelling, Micromotives and Macrobehavior, W. W. Norton, 1978.
5. Albert O. Hirschman, Exit, Voice and Loyalty: Responses to Decline in Firms,



- Organizations and States, Harvard University Press,1970.
6. Raghuram Rajan, Fault Lines: How Hidden Fractures Still Threaten the World Economy,2010.
  7. Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action, Cambridge University Press,1990.

**Session 2022-23**

<p><b>B.P. Chaliha College</b>  <b>Nagarbera, Assam</b>  <b>CRITERIA: I</b>  <b>Curricular Aspects</b>  <b>Key indicator 1.3 Curriculum Enrichment</b></p>				
<p>1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum</p>				
Sl. No.	Course Code	Course Name	Year	Course Description
1	ECO-HC-6026	Development Economics-II	2022-23	This paper begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the problems of enforcement experienced in poor countries. The governance of communities and organizations is studied, and this is then linked to questions of sustainable growth.

**SIXTHSEMESTER**

**ECO-HC-6026: DEVELOPMENT ECONOMICS-II**

**Unit 4:** Environment and Sustainable Development Defining sustainability for renewable resources; a brief history of environmental change; common-pool resources; environmental externalities and state regulation of the environment; economic activity and climate change.

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1. Debraj Ray, Development Economics, Oxford University Press,2009.
2. Partha Dasgupta, Economics, A Very Short Introduction, Oxford University Press, 2007
3. Abhijit Banerjee,RolandBenabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press, 2006.
4. Thomas Schelling, Micromotives and Macrobehavior, W. W. Norton,1978.
5. Albert O. Hirschman, Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States, Harvard University Press,1970.
6. Raghuram Rajan, Fault Lines: How Hidden Fractures Still Threaten the World Economy,2010.
7. Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action, Cambridge University Press,1990.

### Session 2018-19

<p><b>B.P. Chaliha College</b>  <b>Nagarbera, Assam</b>  <b>CRITERIA: I</b>  <b>Curricular Aspects</b>  <b>Key indicator 1.3 Curriculum Enrichment</b>          Department of Education</p>				
1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum				
Sl. No.	Course Code	Course Name	Year	Course Description
1	1.01 (Non-CBCS)	FOUNDATION OF EDUCATIONAL THEORIES AND PRINCIPLES	2018-19	The course on <b>Foundation of Educational Theories and Principles</b> includes concept, aims and functions of Education, dimensions of Education, concept of Discipline and Freedom and meaning of Human Values.
2	3.01 (Non-CBCS)	EMERGING ISSUES AND EDUCATION	2018-19	The course on <b>Emerging Issues and Education</b> includes different rising issues related to education. The course also includes meaning and objectives of Women Empowerment and focuses on problems of Women Education with special reference to Assam and various Governmental efforts for achieving quality life, equality of

				opportunities and social justice in relation to women.
3	4.02 (Non-CBCS)	ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION	2018-19	The course on <b>Environmental Education and Population Education</b> intends to enable the students to understand the concept, scope and importance of Environmental and Population Education as well as to make the students aware of environmental stressors and knowledge on disaster management education. The course objectives also include enabling the students to understand the effect of population growth on poverty, health and hygiene.
4	5.03 (Non-CBCS)	TEACHER EDUCATION	2018-19	The course on <b>Teacher Education</b> includes the concept, aims, scope and development of Teacher education in India. The course intends to develop understanding among the students about professional ethics and accountability of teachers.

## **FOUNDATION OF EDUCATIONAL THEORIES AND PRINCIPLES**

### **1<sup>ST</sup> SEMESTER**

#### **PAPER: M 1.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

#### **Objectives:**

1. To be acquainted with 'scientific' and sound principles of education.
2. To understand the concept, nature and scope of education
3. To gain knowledge about different aims of education.
4. To be familiarized with different dimensions of education such as the learner, the teacher and the curriculum.
5. To acquire knowledge about the concept of discipline and freedom.
6. To create awareness among the students about the latest trends and current educational thoughts.

#### **Unit: 1: Meaning, Concept and Scope of Education**

- Meaning of Education

- Definition of Education
- Nature of Education-Education as a process and product
- Scope of Education

### **Unit-2: Functions of Education**

- Functions towards the individual
- Functions towards the society

### **Unit-3: Aims and Objective of Education**

- Importance of Aims of Education, Determinants of aims
- Individual and Social aim of Education
- Cultural and Vocational aim
- Democratic aims
- Objectives of Education – (four fundamental objectives of education in present era)
  - Learning to Know
  - Learning to do
  - Learning to live together
  - Learning to be

### **Unit: 4 Forms of Education**

- Formal Education: School- Meaning and characteristics, Functions and responsibility of School, relationship between school and society.
- Informal Education: Meaning and Characteristics, Educational role of family, Social Institution – State and religious agencies.
- Non formal Education – Meaning and characteristics, Agencies of Non formal Education

### **Unit: 5: Dimensions of Education**

- The Learner–Learner-Centered Education–Meaning, Characteristics.
- The teacher-Qualities and responsibilities (General )
- The Curriculum-Meaning and concept, Need and importance, Principles of curriculum construction
- Co-curricular activities-definition, types and importance

### **Unit: 6: Discipline and Freedom**

- Meaning, concept and need of discipline
- Discipline and order
- Free-discipline
- Maintenance of school discipline - problems and means

### **Unit: 7: Value education**

- Meaning of human values
- Different Types of values (Moral, Social and Aesthetic)
- Need and Importance of value Education
- Realization of values through Education – Role of family, Society, School and Teachers

### Unit: 8: Education for Leisure

- Education for leisure—Concept
- Significance of Education for leisure in modern society
- Types of leisure time activities –as entertainment, as recreation, as personal development
- Organization of leisure time activities at secondary levels of education

### Reference Books:

1. Banerjee A.- Philosophy and Principles of Education, Kolkata, B.B. Kunda and sons
2. Purkail, B.R. – Principles and Practices of Education
3. Ross, J.S. – The Groundwork of Education of Theory.
4. Safaya, R.N. and Shaiyda, B.D. – Development of Educational Theory and Practice, New Delhi, Dhanpat Rai Publishing Co.
5. Raymont, T – Principles of Education.
6. Passi, B.K. & Singh, P. — Value Education, Agra, H.P. Bhargava Book House.

### **EMERGING ISSUES AND EDUCATION**

#### **3<sup>RD</sup> SEMESTER**

#### **PAPER-(M) 3.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

### Objectives:

1. To acquaint the learner with the emerging issues in education.
2. To develop awareness and understanding about different literacy programmes, women empowerment, Human rights, globalization, Vocationalization of secondary education.
3. To develop in students basic understanding regarding students indiscipline –its causes and remedies.
4. To acquaint the students about the need and importance of national integration and International understanding and the role of education in promoting them.
5. To acquaint the students with meaning, importance and means of life skill education.
6. To develop understanding about concept, importance, methods and programmes of Peace Education.

### Unit: 1 Universalization of primary education for national development

- Significance of Universalization of primary education
- Nature of universal literacy programme in India
- Need and Importance of Literacy
- Literacy programmes in India
  - National Adult Education Programme (NAEP)
  - National Literacy Mission (NLC)
  - Total Literacy Campaign (TLC)

- District Primary Education Programme (DPEP)
- Sarva Shiksha Abhiyan (SSA)
- Right of Children to Free and Compulsory Education Act Problems and remedial measures

## **Unit: 2 Education for women's equality and empowerment**

- Problem of women education with special reference to Assam
  - Literacy percentage of women
  - Inadequate nutrition and technology
  - Existing prejudices against women
- Women empowerment—Meaning and objectives
- Governmental efforts for achieving quality life, equality of opportunities and social justice in relation to women
- Role of Education in women empowerment
- Role of NCERT in women empowerment

## **Unit: 3 Education and Human Right**

- Human Right-- Meaning and concept
- Universal Declaration of Human Rights by U.N.
- Human Rights and Indian constitutions
- Importance of human Rights in National development
- Child Right and Democratic Education
- Education and Human Rights - Role of educational institutions in promoting human Rights

## **Unit: 4 Education for National Integration and International Understanding**

- National Integration - Meaning and concept
- International Understanding – Meaning and Concept
- Factors of National Integration and International Understanding
- Role of education in promoting National Integration and International Understanding

## **Unit: 5 Globalization and Education**

- Globalization – Meaning and perspective
- Causes of Globalization
- Impact of Globalization in India

## **Unit: 6 Student Indiscipline and Life Skill Education**

- Student Indiscipline - Meaning, causes and remedies
- Life skill Education – Meaning, importance and means

## **Unit: 7 Vocationalization of Secondary Education**

- Vocationalization of Secondary Education –Concept
- Importance of Vocationalization of Secondary Education
- Vocationalization of Secondary Education in India
- Problems of Vocationalization and suggestion to solve them

### **Unit: 8 Education for Peace**

- Education for Peace - Concept and importance
- Method and Programmes of Peace Education

### **Reference Books:**

1. Prashar, M.R. – Education and Human Rights
2. Singh, M.S. – New Trends in Education.
3. Mohanty, J – Indian Education in the Emerging Society, New Delhi, Sterling Publishers Pvt. Ltd.
4. Jha, Prabeen Kumar – Educating Human Rights in Psycho, Social Perspective, Agra H.P. Bhargava Book House.

## **ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION**

### **4<sup>TH</sup> SEMESTER**

### **PAPER: M.4.02 (CREDITS-8)**

### **(MAJOR COURSE)**

#### **(A) Environmental Education**

#### **Objectives:**

1. To enable the students to understand the concept, scope and importance of environmental education.
2. To enable the students to understand the programmes of environmental education at different levels of education.
3. To make the students aware of environmental stressors and knowledge on disaster management education.

#### **Unit -1 Environmental Education**

- Concept and definition of environment
- Importance of Environmental Education
- Relationship between man and environment - Ecological and Psychological perspective
- Environmental degradation- and education for sustainable development

#### **Unit -2 Environmental education at different Levels of Education**

- Programme of environmental education for --- primary, secondary and higher levels

### **Unit -3 Environmental awareness and attitude change**

- Awareness and attitude change through formal education
- Role of Formal and Non-Formal education
- Role of NGO

### **Unit -4 Environmental stressors and Disaster Management Education**

- Environmental stressors –Natural and man-made
- Disaster Management Education for coping with the environmental situations
- Environmental Education – its problems and prospects with special reference to Assam

## **(B) Population Education**

### **Objectives:**

1. To enable the students to understand the effect of population growth on poverty, health and hygiene
2. To enable the students to understand the importance of population education in school levels

### **Unit -5 Concept of Population Education**

- Population education: concept, Nature and scope and objectives
- Need and importance of population education

### **Unit -6 Population growth and Population Dynamics in India**

- Causes of population growth in India
- Consequence of population growth
- Policies and programme of government of India regarding population control

### **Unit -7 - Population and Quality of life**

- Population in relation to socio –economic development, health status, health services, nutrition
- Effect of population growth on natural resources and environment

### **Unit -8 Population Education and Schools**

- Population Education and Schools-Scope of population education in schools
- Teacher role in creating awareness of population problems



- Method and approaches: Inquiry approach, Observation, Self study, Discussion, Assignment
- Use of mass media (Newspapers, Radio, T.V) and Audio-Visual Aids

### Reference Books:

1. Sharma, R.A. – Environmental Education, Meerut – Surya Publications
2. Mahapatra, D – Environmental Education – Kalyani Publishers
3. Rao, D.G. – Population Education, Sterling Publishers
4. Kuppaswami B, Population Education, Asia Publishing House
5. Baldev, K.P. – Population Crisis in India, National

## TEACHER EDUCATION

### 5<sup>TH</sup> SEMESTER

### PAPER: 5.03 (CREDITS-6)

### (MAJOR COURSE)

### Objectives:

1. To acquaint the learner with the concept, aims, scope and development of teacher education in India.
2. To develop understanding about the different policies and practices and quality assurance in Teacher education along with the needs and importance of in-service training programmes.
3. To acquaint the learner with skilled based and competency based teacher education.
4. To develop understanding about professional ethics and accountability of teacher.
5. To acquainted the learner with different organizations involved in teacher education.

### Unit: 1 Teacher education concept and brief history in India

- Teacher education – concept ,aims ,and scope
- Objective of teacher education
- Development of teacher education in India

### Unit: 2 Teacher Education for different Levels of Education

- Preparation of teachers for
  - Pre-primary
  - Primary and
  - Secondary stages (Pre-services)
- In-service training programme – its need and importance

### Unit: 3: Policies and practices and Quality Assurance in teacher education

- A critical appraisal of the present system of teacher education in India-a study of the various Policies and practices in teacher education in post-independence era
- Quality Assurance in teacher education

- Present problems of teacher education and suggestions for solution

#### **Unit: 4 Teacher education and Educational Technology**

- Skill-based and Competency based teacher education
- Interaction analysis – Flanders interaction analysis
- Simulated Social Skill Training (SSST)

#### **Unit: 5 Teacher's Role, Professional Ethics and Accountability**

- Teacher's Role –
  - As a facilitator of learning
  - In transaction of curriculum
  - As a link between school and society
- Role Expectations of Teacher in the Twenty first century
- Professional ethics and accountability of teacher

#### **Unit: 6 Organizations for Teacher Education**

- District education for Education and Training(DIET)
- State Council for Educational Research and Training (SCERT)
- National Council for Educational Research and Training (NCERT)
- National Council for Teacher Education ( NCTE)
- Central Institution of Educational Technology (CIET)
- National University of Educational Planning and Administration (NUEPA)
- Regional College of education in India and their functions

#### **Reference Books:**

1. Sharma, Sashi Prabha — Teacher Education, Principles, Theories and Practices, New Delhi, Kaniska Publishers.
2. Flanders, Ned, A — Analysing Teacher Behaviour London, Wesley Publishing Company.
3. Gurry, P — Education and the training of Teachers, London Longmans, Green and Company.
4. Mukherjee, S.N. — Education of Teachers in India Vol. I and II, New Delhi S. Chand and Company.
5. Bhargava, M. and Saikia, L. Rasul — Teacher in 21st Century-Challenges, Responsibilities, Creditability, Agra, Rakhi Prakashan.

Session 2019-20

**B.P. Chaliha College**  
**Nagarbera, Assam**  
**CRITERIA: I**  
**Curricular Aspects**  
**Key indicator 1.3 Curriculum Enrichment**

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	1.01 (Non-CBCS)	FOUNDATION OF EDUCATIONAL THEORIES AND PRINCIPLES	2019-20	The course on <b>Foundation of Educational Theories and Principles</b> includes concept, aims and functions of Education, dimensions of Education, concept of Discipline and Freedom and meaning of Human Values.
2	3.01 (Non-CBCS)	EMERGING ISSUES AND EDUCATION	2019-20	The course on <b>Emerging Issues and Education</b> includes different rising issues related to education. The course also includes meaning and objectives of Women Empowerment and focuses on problems of Women Education with special reference to Assam and various Governmental efforts for achieving quality life, equality of opportunities and social justice in relation to women.
3	4.02 (Non-CBCS)	ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION	2019-20	The course on <b>Environmental Education and Population Education</b> intends to enable the students to understand the concept, scope and importance of Environmental and Population Education as well as to make the students aware of environmental stressors and

				knowledge on disaster management education. The course objectives also include enabling the students to understand the effect of population growth on poverty, health and hygiene.
4	5.03 (Non-CBCS)	TEACHER EDUCATION	2019-20	The course on <b>Teacher Education</b> includes the concept, aims, scope and development of Teacher education in India. The course intends to develop understanding among the students about professional ethics and accountability of teachers.

## **FOUNDATION OF EDUCATIONAL THEORIES AND PRINCIPLES**

### **1<sup>ST</sup> SEMESTER**

#### **PAPER: M 1.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

#### **Objectives:**

7. To be acquainted with 'scientific' and sound principles of education.
8. To understand the concept, nature and scope of education
9. To gain knowledge about different aims of education.
10. To be familiarized with different dimensions of education such as the learner, the teacher and the curriculum.
11. To acquire knowledge about the concept of discipline and freedom.
12. To create awareness among the students about the latest trends and current educational thoughts.

#### **Unit: 1: Meaning, Concept and Scope of Education**

- Meaning of Education
- Definition of Education
- Nature of Education-Education as a process and product
- Scope of Education

#### **Unit-2: Functions of Education**

- Functions towards the individual
- Functions towards the society

### **Unit-3: Aims and Objective of Education**

- Importance of Aims of Education, Determinants of aims
- Individual and Social aim of Education
- Cultural and Vocational aim
- Democratic aims
- Objectives of Education – (four fundamental objectives of education in present era)
  - Learning to Know
  - Learning to do
  - Learning to live together
  - Learning to be

### **Unit: 4 Forms of Education**

- Formal Education: School- Meaning and characteristics, Functions and responsibility of School, relationship between school and society.
- Informal Education: Meaning and Characteristics, Educational role of family, Social Institution – State and religious agencies.
- Non formal Education – Meaning and characteristics, Agencies of Non formal Education

### **Unit: 5: Dimensions of Education**

- The Learner–Learner-Centered Education–Meaning, Characteristics.
- The teacher-Qualities and responsibilities (General )
- The Curriculum-Meaning and concept, Need and importance, Principles of curriculum construction
- Co-curricular activities-definition, types and importance

### **Unit: 6: Discipline and Freedom**

- Meaning, concept and need of discipline
- Discipline and order
- Free-discipline
- Maintenance of school discipline - problems and means

### **Unit: 7: Value education**

- Meaning of human values
- Different Types of values (Moral, Social and Aesthetic)
- Need and Importance of value Education
- Realization of values through Education – Role of family, Society ,School and Teachers

### **Unit: 8: Education for Leisure**

- Education for leisure—Concept
- Significance of Education for leisure in modern society

- Types of leisure time activities –as entertainment, as recreation, as personal development
- Organization of leisure time activities at secondary levels of education

### Reference Books:

1. Banerjee A.- Philosophy and Principles of Education, Kolkata, B.B. Kunda and sons
2. Purkail, B.R. – Principles and Practices of Education
3. Ross, J.S. – The Groundwork of Education of Theory.
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5. Raymont, T – Principles of Education.
6. Passi, B.K. & Singh, P. — Value Education, Agra, H.P. Bhargava Book House.

### **EMERGING ISSUES AND EDUCATION**

#### **3<sup>RD</sup> SEMESTER**

#### **PAPER-(M) 3.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

### Objectives:

1. To acquaint the learner with the emerging issues in education.
2. To develop awareness and understanding about different literacy programmes, women empowerment, Human rights, globalization, Vocationalization of secondary education.
3. To develop in students basic understanding regarding students indiscipline –its causes and remedies.
4. To acquaint the students about the need and importance of national integration and International understanding and the role of education in promoting them.
5. To acquaint the students with meaning, importance and means of life skill education.
6. To develop understanding about concept, importance, methods and programmes of Peace Education.

### **Unit: 1 Universalization of primary education for national development**

- Significance of Universalization of primary education
- Nature of universal literacy programme in India
- Need and Importance of Literacy
- Literacy programmes in India
  - National Adult Education Programme (NAEP)
  - National Literacy Mission (NLC)
  - Total Literacy Campaign (TLC)
  - District Primary Education Programme (DPEP)
  - Sarva Shiksha Abhiyan (SSA)
  - Right of Children to Free and Compulsory Education Act Problems and remedial measures

### **Unit: 2 Education for women's equality and empowerment**

- Problem of women education with special reference to Assam
  - Literacy percentage of women

- Inadequate nutrition and technology
- Existing prejudices against women
- Women empowerment—Meaning and objectives
- Governmental efforts for achieving quality life, equality of opportunities and social justice in relation to women
- Role of Education in women empowerment
- Role of NCERT in women empowerment

### **Unit: 3 Education and Human Right**

- Human Right-- Meaning and concept
- Universal Declaration of Human Rights by U.N.
- Human Rights and Indian constitutions
- Importance of human Rights in National development
- Child Right and Democratic Education
- Education and Human Rights - Role of educational institutions in promoting human Rights

### **Unit: 4 Education for National Integration and International Understanding**

- National Integration - Meaning and concept
- International Understanding – Meaning and Concept
- Factors of National Integration and International Understanding
- Role of education in promoting National Integration and International Understanding

### **Unit: 5 Globalization and Education**

- Globalization – Meaning and perspective
- Causes of Globalization
- Impact of Globalization in India

### **Unit: 6 Student Indiscipline and Life Skill Education**

- Student Indiscipline - Meaning, causes and remedies
- Life skill Education – Meaning, importance and means

### **Unit: 7 Vocationalization of Secondary Education**

- Vocationalization of Secondary Education –Concept
- Importance of Vocationalization of Secondary Education
- Vocationalization of Secondary Education in India
- Problems of Vocationalization and suggestion to solve them

### **Unit: 8 Education for Peace**

- Education for Peace - Concept and importance

- Method and Programmes of Peace Education

### Reference Books:

1. Prashar, M.R. – Education and Human Rights
2. Singh, M.S. – New Trends in Education.
3. Mohanty, J – Indian Education in the Emerging Society, New Delhi, Sterling Publishers Pvt. Ltd.
4. Jha, Prabeen Kumar – Educating Human Rights in Psycho, Social Perspective, Agra H.P. Bhargava Book House.

## **ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION**

### **4<sup>TH</sup> SEMESTER**

### **PAPER: M.4.02 (CREDITS-8)**

### **(MAJOR COURSE)**

### **(C) Environmental Education**

#### **Objectives:**

4. To enable the students to understand the concept, scope and importance of environmental education.
5. To enable the students to understand the programmes of environmental education at different levels of education.
6. To make the students aware of environmental stressors and knowledge on disaster management education.

#### **Unit -1 Environmental Education**

- Concept and definition of environment
- Importance of Environmental Education
- Relationship between man and environment - Ecological and Psychological perspective
- Environmental degradation- and education for sustainable development

#### **Unit -2 Environmental education at different Levels of Education**

- Programme of environmental education for --- primary, secondary and higher levels

#### **Unit -3 Environmental awareness and attitude change**

- Awareness and attitude change through formal education
- Role of Formal and Non-Formal education
- Role of NGO



#### **Unit -4 Environmental stressors and Disaster Management Education**

- Environmental stressors –Natural and man-made
- Disaster Management Education for coping with the environmental situations
- Environmental Education – its problems and prospects with special reference to Assam

#### **(D) Population Education**

##### **Objectives:**

3. To enable the students to understand the effect of population growth on poverty, health and hygiene
4. To enable the students to understand the importance of population education in school levels

#### **Unit -5 Concept of Population Education**

- Population education: concept, Nature and scope and objectives
- Need and importance of population education

#### **Unit -6 Population growth and Population Dynamics in India**

- Causes of population growth in India
- Consequence of population growth
- Policies and programme of government of India regarding population control

#### **Unit -7 - Population and Quality of life**

- Population in relation to socio –economic development, health status, health services, nutrition
- Effect of population growth on natural resources and environment

#### **Unit -8 Population Education and Schools**

- Population Education and Schools-Scope of population education in schools
- Teacher role in creating awareness of population problems
- Method and approaches: Inquiry approach, Observation, Self study, Discussion, Assignment
- Use of mass media (Newspapers, Radio, T.V) and Audio-Visual Aids

##### **Reference Books:**

1. Sharma, R.A. – Environmental Education, Meerut – Surya Publications
2. Mahapatra, D – Environmental Education – Kalyani Publishers

3. Rao, D.G. – Population Education, Sterling Publishers
4. Kuppaswami B, Population Education, Asia Publishing House
5. Baldev, K.P. – Population Crisis in India, National

## **TEACHER EDUCATION**

### **5<sup>TH</sup> SEMESTER**

#### **PAPER: 5.03 (CREDITS-6)**

#### **(MAJOR COURSE)**

#### **Objectives:**

1. To acquaint the learner with the concept, aims, scope and development of teacher education in India.
2. To develop understanding about the different policies and practices and quality assurance in Teacher education along with the needs and importance of in-service training programmes.
3. To acquaint the learner with skilled based and competency based teacher education.
4. To develop understanding about professional ethics and accountability of teacher.
5. To acquainted the learner with different organizations involved in teacher education.

#### **Unit: 1 Teacher education concept and brief history in India**

- Teacher education – concept ,aims ,and scope
- Objective of teacher education
- Development of teacher education in India

#### **Unit: 2 Teacher Education for different Levels of Education**

- Preparation of teachers for
  - Pre-primary
  - Primary and
  - Secondary stages (Pre-services)
- In-service training programme – its need and importance

#### **Unit: 3: Policies and practices and Quality Assurance in teacher education**

- A critical appraisal of the present system of teacher education in India-a study of the various Policies and practices in teacher education in post-independence era
- Quality Assurance in teacher education
- Present problems of teacher education and suggestions for solution

#### **Unit: 4 Teacher education and Educational Technology**

- Skill-based and Competency based teacher education
- Interaction analysis – Flanders interaction analysis
- Simulated Social Skill Training (SSST)

#### **Unit: 5 Teacher's Role, Professional Ethics and Accountability**

- Teacher's Role –

- As a facilitator of learning
- In transaction of curriculum
- As a link between school and society
- Role Expectations of Teacher in the Twenty first century
- Professional ethics and accountability of teacher

### Unit: 6 Organizations for Teacher Education

- District education for Education and Training(DIET)
- State Council for Educational Research and Training (SCERT)
- National Council for Educational Research and Training (NCERT)
- National Council for Teacher Education ( NCTE)
- Central Institution of Educational Technology (CIET)
- National University of Educational Planning and Administration (NUEPA)
- Regional College of education in India and their functions

### Reference Books:

1. Sharma, Sashi Prabha — Teacher Education, Principles, Theories and Practices, New Delhi, Kaniska Publishers.
2. Fhanders, Ned, A — Analysing Teacher Behaviour London, Wesly Publishing Company.
3. Gurry, P — Education and the training of Teachers, London Longmans, Green and Company.
4. Mukherjee, S.N. — Education of Teachers in India Vol. I and II, New Delhi S. Chand and Company.

Bhargava, M. and Saikia, L. Rasul — Teacher in 21st Century-Challenges, Responsibilities, Creditability, Agra, Rakhi Prakashan.

### Session 2020-21

<b>B.P. Chaliha College</b> <b>Nagarbera, Assam</b> <b>CRITERIA: I</b> <b>Curricular Aspects</b> <b>Key indicator 1.3 Curriculum Enrichment</b>				
1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum				
Sl. No.	Course Code	Course Name	Year	Course Description
1	1.01 (Non-CBCS)	FOUNDATION OF EDUCATIONAL	2020-21	The course on <b>Foundation of Educational Theories and Principles</b> includes concept, aims

		THEORIES AND PRINCIPLES		and functions of Education, dimensions of Education, concept of Discipline and Freedom and meaning of Human Values.
2	3.01 (Non-CBCS)	EMERGING ISSUES AND EDUCATION	2020-21	The course on <b>Emerging Issues and Education</b> includes different rising issues related to education. The course also includes meaning and objectives of Women Empowerment and focuses on problems of Women Education with special reference to Assam and various Governmental efforts for achieving quality life, equality of opportunities and social justice in relation to women.
3	4.02 (Non-CBCS)	ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION	2020-21	The course on <b>Environmental Education and Population Education</b> intends to enable the students to understand the concept, scope and importance of Environmental and Population Education as well as to make the students aware of environmental stressors and knowledge on disaster management education. The course objectives also include enabling the students to understand the effect of population growth on poverty, health and hygiene.
4	5.03 (Non-CBCS)	TEACHER EDUCATION	2020-21	The course on <b>Teacher Education</b> includes the concept, aims, scope and development of Teacher education in India. The course intends to develop understanding among the students about professional ethics and accountability of teachers.

# **FOUNDATION OF EDUCATIONAL THEORIES AND PRINCIPLES**

## **1<sup>ST</sup> SEMESTER**

### **PAPER: M 1.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

#### **Objectives:**

1. To be acquainted with 'scientific' and sound principles of education.
2. To understand the concept, nature and scope of education
3. To gain knowledge about different aims of education.
4. To be familiarized with different dimensions of education such as the learner, the teacher and the curriculum.
5. To acquire knowledge about the concept of discipline and freedom.
6. To create awareness among the students about the latest trends and current educational thoughts.

#### **Unit: 1: Meaning, Concept and Scope of Education**

- Meaning of Education
- Definition of Education
- Nature of Education-Education as a process and product
- Scope of Education

#### **Unit-2: Functions of Education**

- Functions towards the individual
- Functions towards the society

#### **Unit-3: Aims and Objective of Education**

- Importance of Aims of Education, Determinants of aims
- Individual and Social aim of Education
- Cultural and Vocational aim
- Democratic aims
- Objectives of Education – (four fundamental objectives of education in present era)
  - Learning to Know
  - Learning to do
  - Learning to live together
  - Learning to be

#### **Unit: 4 Forms of Education**

- Formal Education: School- Meaning and characteristics, Functions and responsibility of School, relationship between school and society.
- Informal Education: Meaning and Characteristics, Educational role of family, Social Institution – State and religious agencies.
- Non formal Education – Meaning and characteristics, Agencies of Non formal Education

### **Unit: 5: Dimensions of Education**

- The Learner–Learner-Centered Education–Meaning, Characteristics.
- The teacher-Qualities and responsibilities (General )
- The Curriculum-Meaning and concept, Need and importance, Principles of curriculum construction
- Co-curricular activities-definition, types and importance

### **Unit: 6: Discipline and Freedom**

- Meaning, concept and need of discipline
- Discipline and order
- Free-discipline
- Maintenance of school discipline - problems and means

### **Unit: 7: Value education**

- Meaning of human values
- Different Types of values (Moral, Social and Aesthetic)
- Need and Importance of value Education
- Realization of values through Education – Role of family, Society ,School and Teachers

### **Unit: 8: Education for Leisure**

- Education for leisure—Concept
- Significance of Education for leisure in modern society
- Types of leisure time activities –as entertainment, as recreation, as personal development
- Organization of leisure time activities at secondary levels of education

### **Reference Books:**

1. Banerjee A.- Philosophy and Principles of Education, Kolkata, B.B. Kunda and sons
2. Purkail, B.R. – Principles and Practices of Education
3. Ross, J.S. – The Groundwork of Education of Theory.
4. Safaya, R.N. and Shaiyda, B.D. – Development of Educational Theory and Practice, New Delhi, Dhanpat Rai Publishing Co.
5. Raymont, T – Principles of Education.
6. Passi, B.K. & Singh, P. — Value Education, Agra, H.P. Bhargava Book House.

### **EMERGING ISSUES AND EDUCATION**

#### **3<sup>RD</sup> SEMESTER**

#### **PAPER-(M) 3.01 (CREDITS-8)**

#### **(MAJOR COURSE)**

### **Objectives:**

1. To acquaint the learner with the emerging issues in education.
2. To develop awareness and understanding about different literacy programmes, women

empowerment, Human rights, globalization, Vocationalization of secondary education.

3. To develop in students basic understanding regarding students indiscipline –its causes and remedies.
4. To acquaint the students about the need and importance of national integration and International understanding and the role of education in promoting them.
5. To acquaint the students with meaning, importance and means of life skill education.
6. To develop understanding about concept, importance, methods and programmes of Peace Education.

### **Unit: 1 Universalization of primary education for national development**

- Significance of Universalization of primary education
- Nature of universal literacy programme in India
- Need and Importance of Literacy
- Literacy programmes in India
  - National Adult Education Programme (NAEP)
  - National Literacy Mission (NLC)
  - Total Literacy Campaign (TLC)
  - District Primary Education Programme (DPEP)
  - Sarva Shiksha Abhiyan (SSA)
  - Right of Children to Free and Compulsory Education Act Problems and remedial measures

### **Unit: 2 Education for women's equality and empowerment**

- Problem of women education with special reference to Assam
  - Literacy percentage of women
  - Inadequate nutrition and technology
  - Existing prejudices against women
- Women empowerment—Meaning and objectives
- Governmental efforts for achieving quality life, equality of opportunities and social justice in relation to women
- Role of Education in women empowerment
- Role of NCERT in women empowerment

### **Unit: 3 Education and Human Right**

- Human Right-- Meaning and concept
- Universal Declaration of Human Rights by U.N.
- Human Rights and Indian constitutions
- Importance of human Rights in National development
- Child Right and Democratic Education
- Education and Human Rights - Role of educational institutions in promoting human Rights

### **Unit: 4 Education for National Integration and International Understanding**

- National Integration - Meaning and concept

- International Understanding – Meaning and Concept
- Factors of National Integration and International Understanding
- Role of education in promoting National Integration and International Understanding

#### **Unit: 5 Globalization and Education**

- Globalization – Meaning and perspective
- Causes of Globalization
- Impact of Globalization in India

#### **Unit: 6 Student Indiscipline and Life Skill Education**

- Student Indiscipline - Meaning, causes and remedies
- Life skill Education – Meaning, importance and means

#### **Unit: 7 Vocationalization of Secondary Education**

- Vocationalization of Secondary Education –Concept
- Importance of Vocationalization of Secondary Education
- Vocationalization of Secondary Education in India
- Problems of Vocationalization and suggestion to solve them

#### **Unit: 8 Education for Peace**

- Education for Peace - Concept and importance
- Method and Programmes of Peace Education

#### **Reference Books:**

1. Prashar, M.R. – Education and Human Rights
2. Singh, M.S. – New Trends in Education.
3. Mohanty, J – Indian Education in the Emerging Society, New Delhi, Sterling Publishers Pvt. Ltd.
4. Jha, Prabeen Kumar – Educating Human Rights in Psycho, Social Perspective, Agra H.P. Bhargava Book House.



# **ENVIRONMENTAL EDUCATION AND POPULATION EDUCATION**

## **4<sup>TH</sup> SEMESTER**

### **PAPER: M.4.02 (CREDITS-8)**

#### **(MAJOR COURSE)**

#### **(E) Environmental Education**

##### **Objectives:**

1. To enable the students to understand the concept, scope and importance of environmental education.
2. To enable the students to understand the programmes of environmental education at different levels of education.
3. To make the students aware of environmental stressors and knowledge on disaster management education.

##### **Unit -1 Environmental Education**

- Concept and definition of environment
- Importance of Environmental Education
- Relationship between man and environment - Ecological and Psychological perspective
- Environmental degradation- and education for sustainable development

##### **Unit -2 Environmental education at different Levels of Education**

- Programme of environmental education for --- primary, secondary and higher levels

##### **Unit -3 Environmental awareness and attitude change**

- Awareness and attitude change through formal education
- Role of Formal and Non-Formal education
- Role of NGO

##### **Unit -4 Environmental stressors and Disaster Management Education**

- Environmental stressors –Natural and man-made
- Disaster Management Education for coping with the environmental situations
- Environmental Education – its problems and prospects with special reference to Assam

## (F) Population Education

### Objectives:

1. To enable the students to understand the effect of population growth on poverty, health and hygiene
2. To enable the students to understand the importance of population education in school levels

### Unit -5 Concept of Population Education

- Population education: concept, Nature and scope and objectives
- Need and importance of population education

### Unit -6 Population growth and Population Dynamics in India

- Causes of population growth in India
- Consequence of population growth
- Policies and programme of government of India regarding population control

### Unit -7 - Population and Quality of life

- Population in relation to socio –economic development, health status, health services, nutrition
- Effect of population growth on natural resources and environment

### Unit -8 Population Education and Schools

- Population Education and Schools-Scope of population education in schools
- Teacher role in creating awareness of population problems
- Method and approaches: Inquiry approach, Observation, Self study, Discussion, Assignment
- Use of mass media (Newspapers, Radio, T.V) and Audio-Visual Aids

### Reference Books:

1. Sharma, R.A. – Environmental Education, Meerut – Surya Publications
2. Mahapatra, D – Environmental Education – Kalyani Publishers
3. Rao, D.G. – Population Education, Sterling Publishers
4. Kuppaswami B, Population Education, Asia Publishing House
5. Baldev, K.P. – Population Crisis in India, National

**TEACHER EDUCATION**  
**5<sup>TH</sup> SEMESTER**  
**PAPER: 5.03 (CREDITS-6)**  
**(MAJOR COURSE)**

**Objectives:**

1. To acquaint the learner with the concept, aims, scope and development of teacher education in India.
2. To develop understanding about the different policies and practices and quality assurance in Teacher education along with the needs and importance of in-service training programmes.
3. To acquaint the learner with skilled based and competency based teacher education.
4. To develop understanding about professional ethics and accountability of teacher.
5. To acquainted the learner with different organizations involved in teacher education.

**Unit: 1 Teacher education concept and brief history in India**

- Teacher education – concept ,aims ,and scope
- Objective of teacher education
- Development of teacher education in India

**Unit: 2 Teacher Education for different Levels of Education**

- Preparation of teachers for
  - Pre-primary
  - Primary and
  - Secondary stages (Pre-services)
- In-service training programme – its need and importance

**Unit: 3: Policies and practices and Quality Assurance in teacher education**

- A critical appraisal of the present system of teacher education in India-a study of the various Policies and practices in teacher education in post-independence era
- Quality Assurance in teacher education
- Present problems of teacher education and suggestions for solution

**Unit: 4 Teacher education and Educational Technology**

- Skill-based and Competency based teacher education
- Interaction analysis – Flanders interaction analysis
- Simulated Social Skill Training (SSST)

**Unit: 5 Teacher's Role, Professional Ethics and Accountability**

- Teacher's Role –
  - As a facilitator of learning
  - In transaction of curriculum
  - As a link between school and society

- Role Expectations of Teacher in the Twenty first century
- Professional ethics and accountability of teacher

### **Unit: 6 Organizations for Teacher Education**

- District education for Education and Training(DIET)
- State Council for Educational Research and Training (SCERT)
- National Council for Educational Research and Training (NCERT)
- National Council for Teacher Education ( NCTE)
- Central Institution of Educational Technology (CIET)
- National University of Educational Planning and Administration (NUEPA)
- Regional College of education in India and their functions

### **Reference Books:**

1. Sharma, Sashi Prabha — Teacher Education, Principles, Theories and Practices, New Delhi, Kaniska Publishers.
2. Fhanders, Ned, A — Analysing Teacher Behaviour London, Wesly Publishing Company.
3. Gurry, P — Education and the training of Teachers, London Longmans, Green and Company.
4. Mukherjee, S.N. — Education of Teachers in India Vol. I and II, New Delhi S. Chand and Company.

Bhargava, M. and Saikia, L. Rasul — Teacher in 21st Century-Challenges, Responsibilities, Creditability, Agra, Rakhi Prakashan.

Session 2021-22

**B.P. Chaliha College  
Nagarbera, Assam**

**CRITERIA: I**

**Curricular Aspects**

**Key indicator 1.3 Curriculum Enrichment**

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	EDU-HC-3036 (CBCS)	VALUE AND PEACE EDUCATION	2021-22	The course on <b>Value and Peace Education</b> includes concept of Value and Peace and its importance on human life as well as the role of Education in building a value based society.
2	EDU-HC-4036 (CBCS)	EMERGING ISSUES IN EDUCATION	2021-22	The course on <b>Emerging Issues in Education</b> includes major emerging issues related to Social Inequality, Liberalization, Privatization, Globalization and major Environmental Issues.
3	EDU-HE-5046 (CBCS)	TEACHER EDUCATION IN INDIA	2021-22	The course on <b>Teacher Education</b> includes concept and significance of Teacher Education, status of Teacher Education in India and the responsibilities and Professional ethics of Teacher Education.

**EDU-HC-3036**

**VALUE AND PEACE EDUCATION**

**TOTAL MARKS: 100 (EXTERNAL: 80 AND INTERNAL: 20)**

## CREDIT-6

### Course Objectives:

After completion of this course the learner will be able to:

- Understand the concept and meaning of value.
- Become aware about the role of educational institutions in building a value based society.
- Understand the meaning and concept of peace and its importance in human life.
- Understand the meaning and importance of peace education and its relevance at national and international level.
- Identify the different issues/ challenges in imparting peace education.
- Identify the strategies and skills in promoting peace education at institutional level.

### Unit-1 Value

- Concept and characteristics of value.
- Sources of values
- Impact of globalization on culture and values.
- Importance of values in human life

### Unit-2 Types of values, their characteristics, functions and educational significance

- Core values.
- Social values
- Moral values
- Religious and spiritual values.
- Aesthetic values.
- Personal values

### Unit-3 Value education

- Concept, characteristics, Objectives and Importance of value education.
- Value education at different stages -
  - Primary
  - Secondary
  - Higher education.
- Role of teacher and family in imparting value education.

### Unit-4 Peace education

- Meaning, definition and characteristics of peace.
- Importance of peace in human life.
- Teacher's role in promoting peace.
- Concept, need and characteristics of peace education
- Curricular contents of peace education at different levels – Primary, Secondary and Higher Education

- Strategies and skills in promoting peace education
- Relevance of peace education in national and international context

### **Unit-5 Challenges of Peace education and Role of Different Organisations**

- Challenges of peace education
- Role of national and international organizations for promoting peace education –
  - International Institute for Peace (IIP)
  - UNESCO
  - International Peace Bureau (IBP)
  - UNO
  - UNICEF
  - Global Peace Foundation(GPF)
  - Mahatma Gandhi Institute of Education for Peace and Sustainable Development.

### **Recommended Readings:**

1. Agarwal, J.C.(2005). Education for Values, Environment and Human rights. New Delhi: Shipra Publication.
2. Chakrabarty, M. (1997).Value education: Changing Perspective.New Delhi:Krishna Publishers Distribution.
3. Chitakra,M.G. (2007).Education and Human Values. New Delhi APH Publishing Corporation.
4. Mishra, L (2009). Peace education-Framework for teachers.New Delhi: APH Publishing Corporation.
5. Panda. P.K.(2017). Value Education.Guwahati: Nivedita Book Distributors.
6. Rajput,J.S.(2002).Human Values in School Education. New Delhi: Anmol Publication.
7. Singh,S.P. (2011).Education for World Peace. New Delhi: Discovery Publishing House.
8. Suryanarayana.N.V.S.(2017). Education and Human Value.Guwahati: Nivedita Book Distributors.

**EDU-HC-4036**

**EMERGING ISSUES IN EDUCATION**

**TOTAL MARKS: 100 (EXTERNAL=80 AND INTERNAL=20)**

**CREDIT-6**

### **Objectives:**

After completion of this unit, students will able to

- Make the students acquaint with major emerging issues national, state, and local
- Acquaint the students with the various issues in education that are emerging in the recent years in the higher education system
- Address the various problems and challenges of education in India at all levels. Course

## contents

### **Unit-1 Social Inequality in Education and Constitutional Safeguards**

- Concept of Social Inequality
- Constitutional Provision for Ensuring Equality in Education
- Education of Socially Disadvantaged Section: SCs, STs and Minorities , Education of people of Char area of Assam
- Education for Backward Children, Child Labour, Street Children and Slum Dwellers
- **Gender Disparity and Rural-Urban Disparity in Education**

### **Unit-2 Liberalization, Privatization and Globalization of Education**

- Liberalization: Concept and its impact on education
- Privatization: Concept and its impact on education
- Globalization: Concept and its impact on education
- Public-private Partnership
- Education as investment

### **Unit-3 Issues related to Students**

- Youth Unrest: Concept, Causes and Remedies
- Campus Disturbance: Concept, Causes and Remedies
- Examination Anxiety: Concept, Causes and Remedies
- Issues related to Educated Unemployment.

### **Unit-4 Environmental Education and Population Education**

- **Main Environmental Issues: Global Warming, Ozone Depletion and Environmental Pollution**
- **Role of Environmental Education for Sustainable Development**
- **Role of Different Stakeholders (Government and Non-Government Organisations, Women, Media) in Environmental Protection**
- **Population Explosion: Its Causes and Consequences**
- **Population Education for Population Control**

### **Unit-5 Multi-Cultural Education and Alternative Education**

- Concept, Objectives and Need of Multi-Cultural Education
- Curriculum and Instruction of Multi-Cultural Education
- Issues related to Multi-Cultural Education
- Concept of Alternative Education and its related Issues
- Role of NIOS and Sakshar Bharat Mission in Alternative Education
- Role of IGNOU and KKHSOU in Alternative Higher Education
- MOOC and its related Issues.



### **Recommended Readings:**

1. Aggarwal J. C. (1997). Development and Planning of Modern Education. New Delhi: Vikas Publishing House Ltd.
2. Chandel and Nand (2011). Population Education. Agra: Shri Vinod Pustak Mandir.
3. Krishnamacharyulu, V. (2005). Environmental Education. Hyderabad: Neelkamal Publications Pvt. Ltd.
4. Mishra and Mohanty (2013). Trends and Issues in Indian Education. Meerut: R. Lall Book Depot.
5. Taj, Haseen (2011). Current Challenges in Education. Hyderabad: Neelkamal Publications Pvt. Ltd.
6. Tiwari, R.P. Problems of Education in N.E. India. Ludhiana: Tandon Publications.

**EDU-HE-5046**

**TEACHER EDUCATION IN INDIA**

**TOTAL MARKS: 100 (EXTERNAL: 80 AND INTERNAL: 20)**

**CREDIT-6**

### **Course Objectives:**

After completion of this course the learner will be able to:

- Explain the Concept, Scope, Aims & Objectives and Significance of teacher education
- Acquaint with the development of Teacher Education in India
- Acquaint with the different organizing bodies of teacher education in India and their functions in preparation of teachers for different levels of education
- Acquaint with the innovative trends and recent issues in teacher education, and be able to critically analyse the status of teacher education in India
- Understand and conceive the qualities, responsibilities and professional ethics of teachers

**Unit-1 Conceptual Framework and Historical Perspectives of Teacher Education in India**

- Teacher Education-Concept, scope and aims and objectives
- Need and Significance of Teacher Education in 21st Century
- Types of Teacher Education-Pre-service and In-service
- Development of Teacher Education in India
- Shifting focus from Teacher Training to Teacher Education

### **Unit-2 Teacher Education for Different Levels of Education**

- Preparation of Teachers for Pre-Primary Level of education
- Preparation of Teachers for Primary Level of education
- Preparation of Teachers for Secondary Level of education
- Preparation of Teachers for Higher Level of education

### **Unit-3 Structure and Organisations of Teacher Education in India**

- Basic Training Centre (BTC)
- District Institute for Education and Training (DIET)
- State Council for Educational Research and Training (SCERT)
- National Council for Educational Research and Training (NCERT)
- National Council for Teacher Education (NCTE)
- National University of Educational Training and Administration (NUEPA)
- Regional Colleges of Education

### **Unit-4 Status of Teacher Education in India: Trends, Issues and Challenges**

- Skill and Competency based Teacher Education, Flanders Interaction Analysis, Micro Teaching and Simulated Social Skill Teaching (SSST)
- National Curriculum Framework for Teacher Education (NCFTE), 2009
- NCTE Regulations, 2014
- Present problems of Teacher Education in India and their solution
- Quality Assurance in Teacher Education and its challenges

### **Unit-5 Quality, Responsibility and Professional Ethics of Teachers**

- Qualities and responsibilities of a teacher
- Teacher as a Facilitator, Counsellor and Practitioner-Researcher
- Role expectations of Teachers in twenty first century
- Professional ethics and accountability of teachers

### **Recommended Readings:**

1. Aggarwal, J.C. (2004). Teacher and Education in a Developing Society. New Delhi: Vikas Publishing House Pvt. Ltd.
2. Bhargava, M. & Saikia, L.Rasul (2012). Teacher in 21st Century- Challenges, Responsibilities, Creditability. Agra: Rakhi Prakashan.
3. Flanders, Ned, A. (1970). Analysing Teacher Behaviour. London: Wesley Publishing

- Company.
4. Gurrey, P. Education and the Training of Teachers. London: Longmans, Green and Company.
  5. Mukherjee, S.N. (1968). Education of Teachers in India, Vol.-I and II. New Delhi: S. Chand and Company.
  6. Rajput, J.S. and Walia, K. (2002). Teacher Education in India. New Delhi: Sterling Publishers Pvt. Ltd.
  7. Sharma, Sashi Prabha (2004). Teacher Education in India. New Delhi: Vikash Publications Pvt. Ltd.

**Session 2022-23**

<p><b>B.P. Chaliha College</b>  <b>Nagarbera, Assam</b>  <b>CRITERIA: I</b>  <b>Curricular Aspects</b>  <b>Key indicator 1.3 Curriculum Enrichment</b></p>				
<p>1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum</p>				
Sl. No.	Course Code	Course Name	Year	Course Description
1	EDU-HC-3036 (CBCS)	VALUE AND PEACE EDUCATION	2022-23	The course on <b>Value and Peace Education</b> includes concept of Value and Peace and its importance on human life as well as the role of Education in building a value based society.
2	EDU-HC-4036 (CBCS)	EMERGING ISSUES IN EDUCATION	2022-23	The course on <b>Emerging Issues in Education</b> includes major emerging issues related to Social Inequality, Liberalization, Privatization, Globalization and major Environmental Issues.

3	EDU-HE-5046 (CBCS)	TEACHER EDUCATION IN INDIA	2022-23	The course on <b>Teacher Education</b> includes concept and significance of Teacher Education, status of Teacher Education in India and the responsibilities and Professional ethics of Teacher Education.
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### EDU-HC-3036

#### VALUE AND PEACE EDUCATION

TOTAL MARKS: 100 (EXTERNAL: 80 AND INTERNAL: 20)

CREDIT-6

#### Course Objectives:

After completion of this course the learner will be able to:

- Understand the concept and meaning of value.
- Become aware about the role of educational institutions in building a value based society.
- Understand the meaning and concept of peace and its importance in human life.
- Understand the meaning and importance of peace education and its relevance at national and international level.
- Identify the different issues/ challenges in imparting peace education.
- Identify the strategies and skills in promoting peace education at institutional level.

#### Unit-1 Value

- Concept and characteristics of value.
- Sources of values
- Impact of globalization on culture and values.
- Importance of values in human life

#### Unit-2 Types of values, their characteristics, functions and educational significance

- Core values.
- Social values
- Moral values
- Religious and spiritual values.
- Aesthetic values.
- Personal values

#### Unit-3 Value education

- Concept, characteristics, Objectives and Importance of value education.
- Value education at different stages -
  - Primary
  - Secondary

- --Higher education.
- Role of teacher and family in imparting value education.

#### **Unit-4 Peace education**

- Meaning, definition and characteristics of peace.
- Importance of peace in human life.
- Teacher's role in promoting peace.
- Concept, need and characteristics of peace education
- Curricular contents of peace education at different levels – Primary, Secondary and Higher Education
- Strategies and skills in promoting peace education
- Relevance of peace education in national and international context

#### **Unit-5 Challenges of Peace education and Role of Different Organisations**

- Challenges of peace education
- Role of national and international organizations for promoting peace education –
  - International Institute for Peace (IIP)
  - UNESCO
  - International Peace Bureau (IBP)
  - UNO
  - UNICEF
  - Global Peace Foundation(GPF)
  - Mahatma Gandhi Institute of Education for Peace and Sustainable Development.

#### **Recommended Readings:**

1. Agarwal, J.C.(2005). Education for Values, Environment and Human rights. New Delhi: Shipra Publication.
2. Chakrabarty, M. (1997).Value education: Changing Perspective.New Delhi:Krishna Publishers Distribution.
3. Chitakra,M.G. (2007).Education and Human Values. New Delhi APH Publishing Corporation.
4. Mishra, L (2009). Peace education-Framework for teachers.New Delhi: APH Publishing Corporation.
5. Panda. P.K.(2017). Value Education.Guwahati: Nivedita Book Distributors.
6. Rajput,J.S.(2002).Human Values in School Education. New Delhi: Anmol Publication.
7. Singh,S.P. (2011).Education for World Peace. New Delhi: Discovery Publishing House.
8. Suryanarayana.N.V.S.(2017). Education and Human Value.Guwahati: Nivedita Book Distributors.

**EDU-HC-4036**  
**EMERGING ISSUES IN EDUCATION**  
**TOTAL MARKS: 100 (EXTERNAL=80 AND INTERNAL=20)**  
**CREDIT-6**

**Objectives:**

After completion of this unit, students will be able to

- Make the students acquainted with major emerging issues national, state, and local
- Acquaint the students with the various issues in education that are emerging in the recent years in the higher education system
- Address the various problems and challenges of education in India at all levels. Course contents

**Unit-1 Social Inequality in Education and Constitutional Safeguards**

- Concept of Social Inequality
- Constitutional Provision for Ensuring Equality in Education
- Education of Socially Disadvantaged Section: SCs, STs and Minorities , Education of people of Char area of Assam
- Education for Backward Children, Child Labour, Street Children and Slum Dwellers
- **Gender Disparity and Rural-Urban Disparity in Education**

**Unit-2 Liberalization, Privatization and Globalization of Education**

- Liberalization: Concept and its impact on education
- Privatization: Concept and its impact on education
- Globalization: Concept and its impact on education
- Public-private Partnership
- Education as investment

**Unit-3 Issues related to Students**

- Youth Unrest: Concept, Causes and Remedies
- Campus Disturbance: Concept, Causes and Remedies
- Examination Anxiety: Concept, Causes and Remedies
- Issues related to Educated Unemployment.

**Unit-4 Environmental Education and Population Education**

- **Main Environmental Issues: Global Warming, Ozone Depletion and Environmental Pollution**
- **Role of Environmental Education for Sustainable Development**
- **Role of Different Stakeholders (Government and Non-Government Organisations, Women, Media) in Environmental Protection**

- Population Explosion: Its Causes and Consequences
- Population Education for Population Control

### **Unit-5 Multi-Cultural Education and Alternative Education**

- Concept, Objectives and Need of Multi-Cultural Education
- Curriculum and Instruction of Multi-Cultural Education
- Issues related to Multi-Cultural Education
- Concept of Alternative Education and its related Issues
- Role of NIOS and Sakshar Bharat Mission in Alternative Education
- Role of IGNOU and KKHSOU in Alternative Higher Education
- MOOC and its related Issues.

### **Recommended Readings:**

1. Aggarwal J. C. (1997). Development and Planning of Modern Education. New Delhi: Vikas Publishing House Ltd.
2. Chandel and Nand (2011). Population Education. Agra: Shri Vinod Pustak Mandir.
3. Krishnamacharyulu, V. (2005). Environmental Education. Hyderabad: Neelkamal Publications Pvt. Ltd.
4. Mishra and Mohanty (2013). Trends and Issues in Indian Education. Meerut: R. Lall Book Depot.
5. Taj, Haseen (2011). Current Challenges in Education. Hyderabad: Neelkamal Publications Pvt. Ltd.
6. Tiwari, R.P. Problems of Education in N.E. India. Ludhiana: Tandon Publications.

**EDU-HE-5046**

**TEACHER EDUCATION IN INDIA**

**TOTAL MARKS: 100 (EXTERNAL: 80 AND INTERNAL: 20)**

**CREDIT-6**

### **Course Objectives:**

After completion of this course the learner will be able to:

- Explain the Concept, Scope, Aims & Objectives and Significance of teacher education
- Acquaint with the development of Teacher Education in India
- Acquaint with the different organizing bodies of teacher education in India and their functions in preparation of teachers for different levels of education
- Acquaint with the innovative trends and recent issues in teacher education, and be able to critically analyse the status of teacher education in India
- Understand and conceive the qualities, responsibilities and professional ethics of teachers

### **Unit-1 Conceptual Framework and Historical Perspectives of Teacher Education in India**

- Teacher Education-Concept, scope and aims and objectives
- Need and Significance of Teacher Education in 21st Century
- Types of Teacher Education-Pre-service and In-service
- Development of Teacher Education in India
- Shifting focus from Teacher Training to Teacher Education

## **Unit-2 Teacher Education for Different Levels of Education**

- Preparation of Teachers for Pre-Primary Level of education
- Preparation of Teachers for Primary Level of education
- Preparation of Teachers for Secondary Level of education
- Preparation of Teachers for Higher Level of education

## **Unit-3 Structure and Organisations of Teacher Education in India**

- Basic Training Centre (BTC)
- District Institute for Education and Training (DIET)
- State Council for Educational Research and Training (SCERT)
- National Council for Educational Research and Training (NCERT)
- National Council for Teacher Education (NCTE)
- National University of Educational Training and Administration (NUEPA)
- Regional Colleges of Education

## **Unit-4 Status of Teacher Education in India: Trends, Issues and Challenges**

- Skill and Competency based Teacher Education, Flanders Interaction Analysis, Micro Teaching and Simulated Social Skill Teaching (SSST)
- National Curriculum Framework for Teacher Education (NCFTE), 2009
- NCTE Regulations, 2014
- Present problems of Teacher Education in India and their solution
- Quality Assurance in Teacher Education and its challenges

## **Unit-5 Quality, Responsibility and Professional Ethics of Teachers**

- Qualities and responsibilities of a teacher
- Teacher as a Facilitator, Counsellor and Practitioner-Researcher
- Role expectations of Teachers in twenty first century
- Professional ethics and accountability of teachers

## **Recommended Readings:**

1. Aggarwal, J.C. (2004). Teacher and Education in a Developing Society. New Delhi: Vikas Publishing House Pvt. Ltd.
2. Bhargava, M. & Saikia, L.Rasul (2012). Teacher in 21st Century- Challenges, Responsibilities, Creditability. Agra: Rakhi Prakashan.
3. Flanders, Ned, A. (1970). Analysing Teacher Behaviour. London: Wesley Publishing



- Company.
4. Gurrey, P. Education and the Training of Teachers. London: Longmans, Green and Company.
  5. Mukherjee, S.N. (1968). Education of Teachers in India, Vol.-I and II. New Delhi: S. Chand and Company.
  6. Rajput, J.S. and Walia, K. (2002). Teacher Education in India. New Delhi: Sterling Publishers Pvt. Ltd.
  7. Sharma, Sashi Prabha (2004). Teacher Education in India. New Delhi: Vikash Publications Pvt. Ltd.

**Session 2021-2022**

**And**

**2022-2023**

<p><b>B.P. Chaliha College</b>  <b>Nagarbera, Assam</b>  <b>CRITERIA: I</b>  <b>Curricular Aspects</b>  <b>Key indicator 1.3 Curriculum Enrichment</b>          Department of English</p>				
1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, <b>Gender</b> , Human Values, Environment and Sustainability in to curriculumS				
Sl. No.	Course Code	Course Name	Year	Course Description
1	ENG-HC-5026	Women's Writing	<b>2021-2022</b> And <b>2022-2023</b>	This paper seeks to direct the students' attention to nineteenth and twentieth century writings by women living in different geographical and socio-cultural settings. Students will get acquainted with the situationally distinct experiences of women articulated in a variety of genres-poetry, novels, short stories, and autobiography, while the selections from Mary Wollstonecraft-the only 18 <sup>th</sup> century text

				<p>prescribed, will acquaint students with the ideas contained in one of the earliest feminist treatises of the western world.</p> <p>Apart from an examination of the themes and styles in the prescribed texts, students will be required to engage themselves with the specificities of the contexts from which the texts emerged and also analyze the women writers' handling of the different genres to articulate their women-centric experiences.</p> <p>Themes: Gender, sexual/textual politics, feminism, body, identity, class, location, voice, space, gender and narrative.</p>
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## **FIFTH SEMESTER**

**ENG-HC-5026 Women's Writing**

**Total Marks: 80 (End-Semester Examination) + 20 (Internal Assessment)**

Time: 3 hours

## Texts:

- Mary Wollstonecraft: *A Vindication of the Rights of Woman* (New York: Norton, 1988) chap. 1, pp. 11–19; chap. 2, pp. 19–38.
- Rassundari Debi: Excerpts from *Amar Jiban* in Susie Tharu and K. Lalitha, eds., *Women's Writing in India*, vol. 1 (New Delhi: OUP, 1989) pp. 191–2.
- Katherine Mansfield: 'Bliss'
- Sylvia Plath: 'Daddy'; 'Lady Lazarus'
- Alice Walker: *The Color Purple*
- Mahashweta Devi: 'Draupadi', tr. Gayatri Chakravorty Spivak (Calcutta: Seagull, 2002)
- Nirupama Bargohain: 'Celebration'
- Adrienne Rich: 'Orion'
- Eunice De Souza: 'Advice to Women'; 'Bequest'

## Suggested Topics and Background Prose Readings for Class

### Presentations Topics

- The Confessional Mode in Women's Writing
- Sexual Politics
- Race, Caste and Gender
- Social Reform and Women's Rights

### Books Suggested:

- Virginia Woolf, *A Room of One's Own* (New York: Harcourt, 1957) chaps. 1 and 6.
- Simone de Beauvoir, 'Introduction', in *The Second Sex*, tr. Constance Borde and Shiela Malovany-Chevallier (London: Vintage, 2010) pp. 3–18.
- Kumkum Sangari and Sudesh Vaid, eds., 'Introduction', in *Recasting Women: Essays in Colonial History* (New Delhi: Kali for Women, 1989) pp. 1–25.
- Susie Tharu & K. Lalitha, Introduction to *Women Writing in India: 600 BC to the Present, Vol. I: 600 BC to the Early 20<sup>th</sup> Century*, Eds. Tharu and Lalitha, (New Delhi: Oxford, 1997 (rpt)) pp. 1–37.

**Session 2018-19**

**B.P. Chaliha College  
Nagarbera, Assam**

**CRITERIA: I**

**Curricular Aspects**

**Key indicator 1.3 Curriculum Enrichment**

Department of History

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	NON CBCS CODE 408	History of Europe (1453-1789)	2018-19	THE COURSE ON EUROPEAN HISTORY COVERS THE IDEAS AND CONCEPTS OF RENAISSANCE, REFORMATION, HUMANISM, INDIVIDUALISM, ETHICAL LIFE ETC.
2	NON CBCS CODE 511 CODE 617	History of Europe (1789-1870) History of Europe (1871-1945)	2018-2019	THE COURSE ON INDIAN HISTORY AND EUROPEAN HISTORY INCLUDES IDEAS AND CONCEPTS RELATED TO HUMAN VALUES, RENAISSANCE, SOCIAL AND MORAL ETHICS ETC.
3	CBCS HIS-HC-3026 HIS-HC-4016	RISE OF THE MODERN WEST-I RISE OF THE MODERN WEST-II	2019-2020	THE COURSE ON MODERN WEST WILL PROVIDE STUDENTS THE KNOWLEDGE OF HUMANISM, CIVILIZATIONAL ETHICS, MORALITY, FREEDOM ETC.
4	CBCS HIS-HC-5016 HIS-HC-6026	HISTORY OF MODERN EUROPE – 1 (C. 1780-1939) HISTORY OF MODERN EUROPE – II (C. 1780-1939)	2019-2020	THE COURSE WILL PROVIDE KNOWLEDGE ON HUMAN VALUES, FREEDOM, ETHICAL DEMOCRACY, SOCIAL AND POLITICAL LIBERTY ETC.
5	CBCS HIS-HC-3026 HIS-HC-4016	RISE OF THE MODERN WEST-I RISE OF THE MODERN WEST-II	2020-2021	THE COURSE ON MODERN WEST WILL PROVIDE STUDENTS THE KNOWLEDGE OF

				HUMANISM, CIVILIZATIONAL ETHICS, MORALITY, FREEDOM ETC.
6	CBCS HIS-HC-5016 HIS-HC-6026	HISTORY OF MODERN EUROPE – I (C. 1780- 1939) HISTORY OF MODERN EUROPE – II (C. 1780- 1939)	2020-2021	THE COURSE WILL PROVIDE KNOWLEDGE ON HUMAN VALUES, FREEDOM, ETHICAL DEMOCRACY, SOCIAL AND POITICAL LIBERTY ETC.
7	CBCS HIS-HC-3026 HIS-HC-4016	RISE OF THE MODERN WEST-I RISE OF THE MODERN WEST-II	2021-2022	THE COURSE ON MODERN WEST WILL PROVIDE STUDENTS THE KNOWLEDGE OF HUMANISM, CIVILIZATIONAL ETHICS, MORALITY, FREEDOM ETC.
8	CBCS HIS-HC-5016 HIS-HC-6026	HISTORY OF MODERN EUROPE – I (C. 1780- 1939) HISTORY OF MODERN EUROPE – II (C. 1780- 1939)	2021-2022	THE COURSE WILL PROVIDE KNOWLEDGE ON HUMAN VALUES, FREEDOM, ETHICAL DEMOCRACY, SOCIAL AND POITICAL LIBERTY ETC.
9	CBCS HIS-HC-3026 HIS-HC-4016	RISE OF THE MODERN WEST-I RISE OF THE MODERN WEST-II	2022-2023	THE COURSE ON MODERN WEST WILL PROVIDE STUDENTS THE KNOWLEDGE OF HUMANISM, CIVILIZATIONAL ETHICS, MORALITY, FREEDOM ETC.
10	CBCS HIS-HC-5016 HIS-HC-6026	HISTORY OF MODERN EUROPE – I (C. 1780- 1939) HISTORY OF MODERN EUROPE – II (C. 1780- 1939)	2022-23	THE COURSE WILL PROVIDE KNOWLEDGE ON HUMAN VALUES, FREEDOM, ETHICAL DEMOCRACY, SOCIAL AND POITICAL LIBERTY ETC.

**FOURTH SEMESTER**

**PAPER CODE: 408**

**PAPER NAME: HISTORY OF EUROPE (1453-1789)**

Unit I: Transition from Medieval to Modern Age i) Feudalism ii) Beginning of the Modern Age iii) Renaissance and its impact on Europe iv) Reformation and its impact. Martin Luther. Peace of Augsburg , Zwingli and Calvin v) Counter Reformation and its effects.

Unit II: i) Thirty Years War: Causes and effects. ii) Rise of Nation-States in Western Europe. iii) The Edict of Nantes; Henry IV; Richelieu; Mazarin's contribution iv) France under Louis XIV.

Unit III: i) Rise of Prussia and Austria: Frederick the Great and Maria Theresa; War of Austrian Succession, Seven Years War ii) Enlightened despotism- Joseph II, Maria Theresa iii) Making of Modern Russia: Peter the Great, Catherine II and Warm Water Policy, iv) Partition of Poland

Unit IV: i) Genesis and growth of Capitalism, Imperialism, Mercantilism and World Conflict ii) Evolution World Politics, The Maritime ascendancy of Holland and its collapse iii) The Anglo- French struggle; triumph of British imperialism.

Reading list:

1. Meenaxi Phukan : Rise of the Modern West
2. C.J.H.Hayes, : History of Europe (Relevant Chapters)
3. M.W.Baldwin and
4. C.W.Cole
5. H.A.L.Fisher : History of Europe Book II and Book III (Relevant Chapters)
6. Euan Cameron (ed) : Early Modern Europe: An Oxford History
7. T.C.W.Blanning (ed) : The Short Oxford History of Europe: The Eighteenth Century

## **FIFTH SEMESTER**

**PAPER CODE: 511**

**PAPER NAME: History of Europe (1789-1870)**

Unit I: **The French Revolution i) Crisis of the Ancient Regime ii) Intellectual Currents, iii) Participation of the Social Classes.**

Unit II: i) Rise and Fall of Napoleon: Internal Reforms, Napoleonic Wars and Continental System, Fall of Napoleon, The Congress of Vienna ii) The European State System after Napoleon, Concert of Europe, Revolutions of 1830 and 1848 and their repercussions

Unit III: i) Eastern Question ii) Napoleon III : Foreign Policy

Unit IV: The Unification of Italy and Germany

READINGS:

1. C.D.Hazan : Europe Since 1815 Lipson
2. C.J.H.Hayes, : Europe in the 19th Century
3. M.W.Baldwin & : History of Europe (Relevant Chapters)
4. C.W.Cole Carlton J.H.Hayes : Contemporary Europe since 1870
5. D. Thompson : Europe since Napoleon
6. H .A.L.Fisher : History of Europe, Book III
7. C.D .M.Ketelbey : A History of Modern Times from 1789
8. J.A.R.Marriott : A History of Europe from 1815 to 1939
9. T.C.W.Blanning (ed): The Short Oxford History of Europe: the Nineteenth Century

## SIXTH SEMESTER

PAPER CODE: 617

PAPER NAME: HISTORY OF EUROPE (1871-1945)

Unit I: i) Internal developments in France: The Republican Constitution of 1875, Relations between the State and the Church ii) Internal Developments in Germany and Italy: Kulturkampf, Economic Developments in Germany, Socialism and the German Reich, Internal Developments in Italy

Unit II: Internal problems of Russia up to 1917: i) Revolution of 1905 iv) Revolutions of 1917

Unit III: World War I and aftermath i) Factors responsible for the World War I ii) Peace settlement iii) The League of Nations: Achievements and Failures

Unit IV: World War II: Origin, Entry of U S A, Defeat of the Axis Power

### READINGS:

1. C.D.Hazen : Europe Since 1815 E. Lipson : Europe in the 19th and 20th Centuries
2. M.W.Baldwin & : History of Europe (Relevant Chapters)
3. C.W.Cole
4. C. J.H.Hayes : Contemporary Europe since 1870
5. C.D .M.Ketelbey : A History of Modern Times from 1789
6. J.A.R.Marriott : A History of Europe from 1815 to 1939
7. T.C.W.Blanning (ed) : The short Oxford History of Europe: the Nineteenth Century
8. J. Evans : The Foundation of a Modern State in 19th Century Europe
9. James Joll : Origin of the First World War
10. Anthony Wood : History of Europe 1815-1960

**THIRD SEMESTER**  
**PAPER CODE: HIS-HC-3026**  
**PAPER NAME: RISE OF THE MODERN WEST – I**  
**Lectures: 5; Tutorial: 1 (per week)**

Unit I. Transition from feudalism (to capitalism):

[a] concepts of feudalism; regional variations

[b] The Crisis of Feudalism

[c] Economic Crisis : commercial decline, decay of towns and epidemics

[d] The transition debate : Maurice Dobb and Paul Sweezy; Marc Bloch, Georges Duby; the Brenner Debate

Unit II. Geographical explorations and early colonial expansion:

[a] Factors and motives behind voyages and explorations

[b] the conquests of the Americas:

[c] beginning of the era of colonization;

[d] mining and plantation; the African slaves.

**Unit III. Renaissance:**

**[a] Origins and impact**

**[b] Humanism in Renaissance**

**[c] Re-discovery of Classics**

[d] Italian influence on Art, Architecture, Culture, Education and Polity; Northern Humanism

**Unit IV. Reformation in the 16th century: Origin and impact**

**[a] Martin Luther, John Calvin, Zwingli**

**[b] The Radical Reformation: Anabaptists, Huguenots**

[c] English Reformation and the state

[d] Counter Revolution

Unit V. Economic developments of the sixteenth century: Shift of economic balance from the Mediterranean to the Atlantic; agricultural revolution , Enclosure movement; Commercial Revolution; Influx of American silver and the Price Revolution.

**READINGS:**

1. Maurice Dobb, Studies in the Development of Capitalism.
2. J. R. Hale, Renaissance Europe.
3. R. Hall, From Galileo to Newton.
4. Christopher Hill, A Century of Revolutions.
5. Rodney Hilton, Transition from Feudalism to Capitalism.
6. M. S. Anderson, Europe in the Eighteenth Century.
7. Perry Anderson, The Lineages of the Absolutist State.
8. G. R. Elton, Reformation Europe, 1517 û 1559.
9. T.S. Aston and C. H. E. Philpin (eds.), The Brenner Debate: Agrarian Class structure and Economic Development in Pre-industrial Europe, Cambridge University Press. 2005
10. H. Butterfield, The Origins of Modern Science.



## FOURTH SEMESTER

PAPER CODE: HIS-HC-4016

PAPER NAME: RISE OF THE MODERN WEST-II

Lectures: 5; Tutorial: 1 (per week)

Unit I. Europe in the 17th Century:

- (a) Formation of nation-states : Spain; France; England; Russia
- (b) The 17th century crisis: economic, social and political dimensions.

Unit II. The English Revolution:

- (a) Major issues.
- (b) Political and intellectual currents.

**Unit III. European Economy:**

- (a) Development of science: Renaissance to the 17th century.**
- (b) Concepts of Mercantilism and Imperialism.
- (c) Mercantilism in the 17th and 18th centuries.

Unit IV. Politics in the 18th century:

- (a) Parliamentary monarchy; patterns of Absolutism in Europe.
- (b) American Revolution : Political and economic issues.**

Unit V. Prelude to the Industrial Revolution.

- (a) Money economy
- (b) The Putting Out system

READINGS:

1. Maurice Dobb, Studies in the Development of Capitalism.
2. J. R. Hale, Renaissance Europe.
3. R. Hall, From Galileo to Newton.
4. Christopher Hill, A Century of Revolutions.
5. Rodney Hilton, Transition from Feudalism to Capitalism.
6. M. S. Anderson, Europe in the Eighteenth Century.
7. Perry Anderson, The Lineages of the Absolutist State.
8. G. R. Elton, Reformation Europe, 1517 û 1559.
9. T.S. Aston and C. H. E. Philpin (eds.), The Brenner Debate: Agrarian Class structure and Economic Development in Pre-industrial Europe, Cambridge University Press. 2005
10. H. Butterfield, The Origins of Modern Science.

## FIFTH SEMESTER

PAPER CODE: HIS-HC-5016

PAPER NAME: History of Modern Europe- I (c. 1780-1939)

Lectures: 5; Tutorial: 1 (per week)

Unit I. The French Revolution and its European repercussions:

[a] Crisis of ancien regime

[b] Intellectual currents.

[c] Social classes and emerging gender relations.

[d] Phases of the French Revolution 1789 - 99.

[e] Art and Culture of French Revolution.

[f] Napoleonic consolidation - reform and empire.

Unit II. Restoration and Revolution: c. 1815 - 1848:

[a] Forces of conservatism & restoration of old hierarchies.

[b] Social, Political and intellectual currents.

[c] Revolutionary and Radical movements, 1830 - 1848.

Unit III Capitalist Industrialization

[a] Process of capitalist development in industry and agriculture: case Studies of Britain, France, the German States and Russia.

Unit IV. Social and Economic Transformation (Late 18th century to c. 1914)

[a] Evolution and Differentiation of social classes: Bourgeoisie, Proletariat, land owning classes and peasantry.

[b] Changing trends in demography and urban patterns.

[c] Family, gender and process of industrialization.

Unit V. Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.

[a] Intellectual currents, popular movements and the formation of National identities in Germany, Italy, Ireland and the Balkans.

[b] Specificities of economic development, political and administrative Reorganization - Italy; Germany.

#### READINGS:

1. E.J. Hobsbawm: The Age of Revolution.
2. Lynn Hunt: Politics, Culture and Class in the French Revolution.
3. James Joll, Europe Since 1870.
4. David Landes: Prometheus Unbound.
5. George Lefebvre, Coming of the French Revolution.
6. George Lichtheim : A Short History of Socialism.
7. Fernand Braudel, History and the Social Science in M. Aymard an
8. H. Mukhia Ed. French Studies in History, Vol. I (1989).
9. Maurice Dobb: Soviet Economic Development Since 1917.
10. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.
11. H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914.
12. E.J. Hobsbawm, Nations and Nationalism.
13. Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).
14. Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.
15. E.P. Thompson: Making of the English Working Class.

### SIXTH SEMESTER

**PAPER CODE: HIS-HC-6026**

**PAPER NAME: HISTORY OF MODERN EUROPE II (c. 1780 -1939)**

**Lectures :5; Tutorial : 1 (per week)**

Unit I. Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries

[a] The struggle for parliamentary democracy and civil liberties in Britain.

[b] Forms of protest during early capitalism: food riots in France and England: Luddites and Chartism.

[c] Early socialist thought; Marxian Socialism and the First and the Second International.

[d] German Social Democracy, Politics and Culture.

[e] Christian Democracy as a political and ideological force in western and central Europe

Unit II. The Crisis of Feudalism in Russia and Experiments in Socialism:

[a] Emancipation of serfs.

[b] Russian Populism and Social Democracy.

[c] Revolutions of 1905; the Bolshevik Revolution of 1917.

[d] Programme of Socialist Construction.

Unit III. Imperialism, War, and Crisis: c. 1880 -1919:

[a] Theories and mechanisms of imperialism;

[b] growth of Militarism; Power blocks and alliances: expansion of European empires - War of 1914 - 1918

Unit IV. The post 1919 World Order

[a] Economic crises, the Great Depression and Recovery.

[b] Rise of Fascism and Nazism.

[c] The Spanish Civil War.

[d] Origins of the Second World War.

**Unit V. Cultural and Intellectual Developments since circa 1850:**

**[a] Changing contexts: [i] Notions of Culture [ii] Creation of a New public sphere and mass media [iii] Mass education and extension of literacy.**

[b] Creation of new cultural forms: from Romanticism to Abstract Art.

[c] Major intellectual trends: [i] Institutionalization of disciplines history, Sociology and Anthropology. [ii] Darwin and Freud.

[d] Culture and the making of ideologies: Constructions of Race, Class and Gender, ideologies of Empire.

READINGS:

1. E.J. Hobsbawm: The Age of Revolution.
2. Lynn Hunt: Politics, Culture and Class in the French Revolution.
3. James Joll, Europe Since 1870.
4. David Landes: Prometheus Unbound.
5. George Lefebvre, Coming of the French Revolution.

6. George Lichtheim : A Short History of Socialism.
7. Fernand Braudel, History and the Social Science in M. Aymard an
8. H. Mukhia Ed. French Studies in History, Vol. I (1989).
9. Maurice Dobb: Soviet Economic Development Since 1917.
10. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.
11. H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914.
12. E.J. Hobsbawm, Nations and Nationalism.
13. Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).
14. Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.
15. E.P. Thompson: Making of the English Working Class.

<b>B.P. Chaliha College</b> <b>Nagarbera, Assam</b> <b>CRITERIA: I</b> <b>Curricular Aspects</b> <b>Key indicator 1.3 Curriculum Enrichment</b> <b>Department of Botany</b>				
1.3.1 Institution integrates cross-cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability into curriculum				
Sl. No.	Course Code	Course Name	Year	Course Description
1	M301	Plant Ecology, plant geography, and evolution	2018-19	The course offers a basic knowledge on ecosystem structure, population ecology, environmental population and their management, phytogeographical regions of India, theories and mechanisms of evolution.
2	BOT-HC-4026	Plant Ecology and Phytogeography	2019-20	The course offers a basic concept on inter-relationships between the living world and

				environment, population ecology, functional aspects of ecosystem, phytogeographical division of India, Vegetation types of NE India with special reference to Assam.
3	BOT-HC-4026	Plant Ecology and Phytogeography	2020-21	The course offers a basic concept on inter-relationships between the living world and environment, population ecology, functional aspects of ecosystem, phytogeographical division of India, Vegetation types of NE India with special reference to Assam.
4	BOT-HC-4026	Plant Ecology and Phytogeography	2021-22	The course offers a basic concept on inter-relationships between the living world and environment, population ecology, functional aspects of ecosystem, phytogeographical division of India, Vegetation types of NE India with special reference to Assam.
5	BOT-HC-4026	Plant Ecology and Phytogeography	2022-23	The course offers a basic concept on inter-relationships between the living world and environment, population ecology, functional aspects of ecosystem, phytogeographical division of India, Vegetation types of NE India with special reference to Assam.

6	BOT-HE-5016	Natural resource management	2021-22	This course offers basic concept on sustainable utilization and its approach towards economic, ecological and socio-cultural aspects
7	BOT-HE-5016	Natural resource management	2022-23	This course offers basic concept on sustainable utilization and its approach towards economic, ecological and socio-cultural aspects
8	BOT-HE-5016	Natural resource management	2023-24	This course offers basic concept on sustainable utilization and its approach towards economic, ecological and socio-cultural aspects

### Course Content

**Paper: M 301 (Theory)**

**(Ecology, Plant Geography, Evolution)**

**Total Marks: 60**

**Time:3 hour**

**Ecology:**

**UNIT I:** Introduction, ecosystem structure (abiotic and biotic components), plant adaptations, responses to water, temperature, and light.

**UNIT II:** Population ecology: population characteristics, ecotypes, ecads, community ecology, community characteristics, frequency, density, cover: IVI, life forms, biological spectrum, and its significance.

**UNIT III:** Ecosystem ecology: Food chain, food web, ecological pyramids, ecosystem function (Energy flow, biochemical cycles), ecosystem services, ecosystem resilience, ecological succession, types and pattern.

**UNIT IV:** Environmental pollution: water pollution, sources and kinds, impact of pollution on aquatic ecosystem, eutrophication of water bodies. Air pollution: sources and kinds, impact on plants and ecosystems.

**Plant Geography:**

**UNIT V:** phytogeographical regions of India: factors regulating distribution of plant endemism, isolation and speciation, vegetation, of India with special reference to North Eastern regions, Major biomes of the world.

**Evolution:**

**UNIT VI:** Evidences, theories, and mechanisms of evolution: origin of new species, gene pool, genetic drift: changes in gene frequencies in population.

**BOT-HC-4026**

**Plant Ecology and Phytogeography**

**Total Lectures: 60 Credits: 6 (Theory - 4, Practical - 2)**

**Time: 3 hour**

**Total Marks: 60**

9.1 THEORY

**Unit 1: *Introduction* (4 lectures)**

Basic concepts; Levels of organization. Inter-relationships between the living world and the environment, the components and dynamism, homeostasis.

**Unit 2: *Soil* (8 lectures)**

Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development.

**Unit 3: *Water* (4 lectures)**



Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table.

**Unit 4: *Adaptation of plants to various environmental factors***

**(6 lectures)**

Light, temperature, wind and fire

**Unit 5: *Biotic interactions***

**(2 lectures)**

Trophic organization, basic source of energy, autotrophy, heterotrophy; symbiosis, commensalism, parasitism; food chains and webs; ecological pyramids; biomass, standing crop.

**Unit 6: *Population ecology* (4 lectures)**

Population characteristics, Growth curve, population regulation, r and k selection. Ecological speciation: Allopatric/ Sympatric and Parapatric speciation.

**Unit 7: *Plant communities* (8 lectures)**

Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic;

Ecotone and edge effect; Dynamics: succession – processes, types; climax concepts.

**Unit 8: *Ecosystems* (4 lectures)**

Structure; Processes; Trophic organisation; Food chains and Food webs; Ecological pyramids.

**Unit 9: *Functional aspects of ecosystem* (8 lectures)**

Principles and models of energy flow; Production and productivity; Ecological efficiencies;

Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.

**Unit 10: *Phytogeography* (12 lectures)**

Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial

biomes (one each from tropical, temperate & tundra); Phytogeographical division of India;

Vegetation types of NE India with special reference to Assam.

**9.2 PRACTICAL**

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.

2. Determination of pH of various soil and water samples using pH meter.
3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.
5. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
6. (a). Study of morphological adaptations of hydrophytes and xerophytes (four each).  
(b). Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobanche*) Epiphytes, Predation (Insectivorous plants).
7. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
8. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.
9. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.
10. Field visit to familiarise students with ecology of different sites.

### **Suggested Readings**

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
4. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
5. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.
6. Smith and Smith (2012): Elements of Ecology. Pearson Publisher (Sixth edition).
7. Bhattacharya, K., Ghosh, A.K. and Hait, G. (2017). A text Book of Botany (Ecology, Environmental Biology, Economic Botany and Pharmacognosy). New Central Book Agency (P) Ltd.
8. Ambasht and Ambasht (2002): A text book of Plant Ecology. CBS publisher and Distributors.

9. Agarwal, A.K. and Deo, P.P. (2006). Plant Ecology. Agrobios (India)
10. William D Bowman, Sally D Hacker and Michael L. Cain (2018) Ecology, Oxford University Press
11. Verma, P.S. and Agarwal V. K. (2003) Environmental Biology-Principles of Ecology. S Chand & Company Ltd, Ramnagar, New Delhi-110055.

## **BOT-HE-5016**

### **Natural Resource Management**

**Total Lectures: 60 Credits: 6 (Theory - 4, Practical - 2)**

#### **1.1 THEORY**

**Unit 1 : Natural resources** **(2 lectures)**

Definition and types.

**Unit 2: Sustainable utilization** **(8 lectures)**

Concept, approaches (economic, ecological and socio-cultural).

**Unit 3: Land** **(8 lectures)**

Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management.

**Unit 4: Water** **(8 lectures)**

Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies.

**Unit 5: Biological Resources** **(10 lectures)**

Biodiversity-definition and types; Significance; Threats; Management strategies; Bio- prospecting; IPR; CBD; National Biodiversity Action Plan).

**Unit 6: Forests** **(6 lectures)**

Definition, Cover and its significance (with special reference to India); Major and minor forestproducts; Depletion; Management.

**Unit 7: Energy** **(6 lectures)**

Renewable and non-renewable sources of energy.

**Unit 8: Contemporary practices in resource management (8 lectures)**

EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management.

**Unit 9: National and international efforts in resource management and conservation**

(4 lectures)

**1.2 PRACTICAL**

1. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Uses of GPS and GIS (Mapping of an area).

**Suggested Readings**

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

Session 2021-22

**B.P. Chaliha College  
Nagarbera, Assam**

**CRITERIA: I**

**Curricular Aspects**

**Key indicator 1.3 Curriculum Enrichment**

Department of Chemistry

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	CHE-SE-5014	Chemical Technology and Society	2021-22	The objective of the course is to enable students to have a firsthand understanding of different types of equipments needed in chemical technology and offer them concepts regarding some important parameters. The syllabus also emphasizes the dynamic nature of the relations between society on one hand and technological achievement from chemical industries on the other hand. In other words, it tries to explore societal and technological issues from a chemical perspective.
2	CHE-HE-6036	<b>Inorganic Materials of Industrial Importance</b>	2021-22	This course will establish the basic foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future. Experiments will help the

			<p>students to gather the experience of qualitative and quantitative chemical analysis. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.</p>
	CHE-HE-6026	<b>Industrial Chemicals and Environment</b>	<p>2021-22</p> <p>After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly “green chemistry” in chemical industry.</p>

(EXAMPLE: THE PORTION WHICH INCLUDES IS HIGHLIGHTED with yellow colour)

## **CHE-SE-3044: CHEMICAL TECHNOLOGY & SOCIETY**

**(Credits: 04)**

**Theory: 60 Lectures**

Chemical Technology

Different types of equipments needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry.

Introduction to clean technology.

Concept of relative humidity, molal humidity, dew point, partial saturation.

Material Balance: Recycle, bypass in batch, stage wise and continuous operations in systems with and without chemical reactions.

**Energy balance: Energy balance of systems with and without chemical reactions.**

Society

Social issues related to soil, air and water pollution

Energy crisis of modern society and search for alternatives such as energy from natural sources (i.e. solar and renewable forms), and from nuclear fission, biofuel, etc.

Pros and cons of use of materials like plastics and polymers and their natural analogues, Genetic engineering and the manufacture of drugs (proteins and nucleic acids, and molecular reactivity and interconversions)

## **CHE-HE-6036: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**

**(Credits: Theory-04, Lab-02)**

**Theory: 60 Lectures**

**Course Objectives:** To learn the synthetic process, properties and the utility of the industrially important inorganic materials (such as silicates, ceramics, cements, fertilizers, paints, batteries, alloys and explosives).

To provide opportunity to learn some of the industrial process such as surface coating and catalysis in relevant to industry where heterogeneous catalysis dominates.

Experiments are aimed at helping learners acquire hands on experience in qualitative and quantitative analysis of the inorganic materials which are basically manufactured in chemical industries.

**Learning Outcome:** This course will establish the basic foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future. Experiments will help the students to gather the experience of qualitative and quantitative chemical analysis. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.

### **Silicate Industries**

*Glass:* Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

*Ceramics:* Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

*Cements:* Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

(16 Lectures)

### **Fertilizers:**

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

(8 Lectures)

### **Surface Coatings:**

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.



(10 Lectures)

**Batteries:**

Primary and secondary batteries, battery components and their role, Characteristics of battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

(6 Lectures)

**Alloys:**

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

(10 Lectures)

**Catalysis:**

General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts.

Phase transfer catalysts, application of zeolites as catalysts.

(6 Lectures)

**Chemical explosives:**

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

(4 Lectures)

## CHE-HE-6026: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits: Theory-04, Lab-02)

Theory: 60 Lectures

**Course Objectives:** This course provides an introduction to the various industrial gases and inorganic chemicals, their manufacturing processes, applications, storage and the hazards of handling them. Contribution of these industrial chemicals towards air and water pollution and their effects on living organisms and the environment has also been covered. Students are also expected to learn about metallurgy, energy generation industry and the pollution threat they pose. This course also discusses about management of the different kinds of wastes, **their** safe disposal and the importance of practicing green chemistry in chemical industry.

**Learning Outcomes:** After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly "green chemistry" in chemical industry.

### Industrial Gases and Inorganic Chemicals

**Industrial Gases:** Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, sulphur dioxide and phosgene.

**Inorganic Chemicals:** Manufacture, application, analysis and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, commonsalt, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassiumpermanganate.

(10 Lectures)

### Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology.

(4 Lectures)

### Environment and its segments

Eco systems. Biogeochemical cycles of carbon, nitrogen and sulphur.

Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone, Major sources of air pollution.

Pollution by SO<sub>2</sub>, CO<sub>2</sub>, CO, NO<sub>x</sub>, H<sub>2</sub>S and other foul smelling gases. Methods of estimation of CO, NO<sub>x</sub>, SO<sub>x</sub> and control procedures.

Effects of air pollution on living organisms and vegetation. Greenhouse effect and Global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and Halogens, removal of sulphur from coal. Control of particulates.

*Water Pollution*: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems.

Water purification methods. Effluent treatment plants (primary, secondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum, and petrochemicals, agro, fertilizer, etc. Sludge disposal.

Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, electro dialysis, ion exchange). Water quality parameters for waste water, industrial water and domestic water.

(30 Lectures)

## **Energy & Environment**

Sources of energy: Coal, petrol and natural gas. Nuclear Fusion / Fission, Solar energy, Hydrogen, geothermal, Tidal and Hydel, etc.

Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management.

(10 Lectures)

## **Biocatalysis**

Introduction to biocatalysis: Importance in "Green Chemistry" and Chemical Industry.

(6 Lectures)

Session 2020-21

**B.P. Chaliha College**  
**Nagarbera, Assam**  
**CRITERIA: I**  
**Curricular Aspects**  
**Key indicator 1.3 Curriculum Enrichment**

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## **CHE-SE-3044: CHEMICAL TECHNOLOGY & SOCIETY**

**(Credits: 04)**

**Theory: 60 Lectures**

Chemical Technology

Different types of equipments needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry.

Introduction to clean technology.

Concept of relative humidity, molal humidity, dew point, partial saturation.

Material Balance: Recycle, bypass in batch, stage wise and continuous operations in systems with and without chemical reactions.

**Energy balance: Energy balance of systems with and without chemical reactions.**

Society

Social issues related to soil, air and water pollution

Energy crisis of modern society and search for alternatives such as energy from natural sources (i.e. solar and renewable forms), and from nuclear fission, biofuel etc.

Pros and cons of use of materials like plastics and polymers and their natural analogues, Genetic engineering and the manufacture of drugs (proteins and nucleic acids, and molecular reactivity and interconversions)

## **CHE-HE-6036: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**

**(Credits: Theory-04, Lab-02)**

**Theory: 60 Lectures**

**Course Objectives:** To learn the synthetic process, properties and the utility of the industrially important inorganic materials (such as silicates, ceramics, cements, fertilizers, paints, batteries, alloys and explosives).

To provide opportunity to learn some of the industrial process such as surface coating and catalysis in relevant to industry where heterogeneous catalysis dominates.

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*Cements:* Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

(16 Lectures)

### **Fertilizers:**

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

(8 Lectures)

### **Surface Coatings:**

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

(10 Lectures)

**Batteries:**

Primary and secondary batteries, battery components and their role, Characteristics of battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

(6 Lectures)

**Alloys:**

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

(10 Lectures)

**Catalysis:**

General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts.

Phase transfer catalysts, application of zeolites as catalysts.

(6 Lectures)

**Chemical explosives:**

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

(4 Lectures)



## CHE-HE-6026: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits: Theory-04, Lab-02)

Theory: 60 Lectures

**Course Objectives:** This course provides an introduction to the various industrial gases and inorganic chemicals, their manufacturing processes, applications, storage and the hazards of handling them. Contribution of these industrial chemicals towards air and water pollution and their effects on living organisms and the environment has also been covered. Students are also expected to learn about metallurgy, energy generation industry and the pollution threat they pose. This course also discusses about management of the different kinds of wastes, **their** safe disposal and the importance of practicing green chemistry in chemical industry.

**Learning Outcomes:** After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly "green chemistry" in chemical industry.

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**Industrial Gases:** Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, sulphur dioxide and phosgene.

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(10 Lectures)

### Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology.

(4 Lectures)

### Environment and its segments

Eco systems. Biogeochemical cycles of carbon, nitrogen and sulphur.

Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone, Major sources of air pollution.

Pollution by SO<sub>2</sub>, CO<sub>2</sub>, CO, NO<sub>x</sub>, H<sub>2</sub>S and other foul smelling gases. Methods of estimation of CO, NO<sub>x</sub>, SO<sub>x</sub> and control procedures.

Effects of air pollution on living organisms and vegetation. Greenhouse effect and Global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and Halogens, removal of sulphur from coal. Control of particulates.

*Water Pollution:* Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems.

Water purification methods. Effluent treatment plants (primary, secondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, agro, fertilizer, etc. Sludge disposal.

Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, electro dialysis, ion exchange). Water quality parameters for waste water, industrial water and domestic water.

(30 Lectures)

## **Energy & Environment**

Sources of energy: Coal, petrol and natural gas. Nuclear Fusion / Fission, Solar energy, Hydrogen, geothermal, Tidal and Hydel, etc.

Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management.

(10 Lectures)

## **Biocatalysis**

Introduction to biocatalysis: Importance in "Green Chemistry" and Chemical Industry.  
(6 Lectures)

Session 2022-23

**B.P. Chaliha College  
Nagarbera, Assam**

**CRITERIA: I**

**Curricular Aspects**

**Key indicator 1.3 Curriculum Enrichment**

1.3.1 Institution integrates cross cutting issues relevant to Professional ethics, Gender, Human Values, Environment and Sustainability in to curriculum

Sl. No.	Course Code	Course Name	Year	Course Description
1	CHE-SE-5014	Chemical Technology and Society	2022-23	The objective of the course is to enable students to have a firsthand understanding of different types of equipments needed in chemical technology and offer them concepts regarding some important parameters. The syllabus also emphasizes the dynamic nature of the relations between society on one hand and technological achievement from chemical industries on the other hand. In other words, it tries to explore societal and technological issues from a chemical perspective.
2	CHE-HE-6036	<b>InorganiM aterials of Industrial Importanc e</b>	2022-23	This course will establish the basic foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future. Experiments will help the

			<p>Students to gather the experience of qualitative and quantitative chemical analysis. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.</p>
	CHE-HE-6026	<b>Industrial Chemicals and Environment</b>	<p>After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly “green chemistry” in chemical industry.</p>

(EXAMPLE: THE PORTION WHICH INCLUDES IS HIGHLIGHTED with yellow colour)

## **CHE-SE-3044: CHEMICAL TECHNOLOGY & SOCIETY**

**(Credits: 04)**

**Theory: 60 Lectures**

Chemical Technology

Different types of equipments needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology.

Concept of relative humidity, molal humidity, dew point, partial saturation.

Material Balance: Recycle, bypass in batch, stage wise and continuous operations in systems with and without chemical reactions.

**Energy balance: Energy balance of systems with and without chemical reactions.**

Society

Social issues related to soil, air and water pollution

Energy crisis of modern society and search for alternatives such as energy from natural sources (i.e. solar and renewable forms), and from nuclear fission, biofuel etc.

Pros and cons of use of materials like plastics and polymers and their natural analogues, Genetic engineering and the manufacture of drugs (proteins and nucleic acids, and molecular reactivity and interconversions)

## **CHE-HE-6036: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**

**(Credits: Theory-04, Lab-02)**

**Theory: 60 Lectures**

**Course Objectives:** To learn the synthetic process, properties and the utility of the industrially important inorganic materials (such as silicates, ceramics, cements, fertilizers, paints, batteries, alloys and explosives).

To provide opportunity to learn some of the industrial process such as surface coating and catalysis in relevant to industry where heterogeneous catalysis dominates.

Experiments are aimed at helping learners acquire hands on experience in qualitative and quantitative analysis of the inorganic materials which are basically manufactured in chemical industries.

**Learning Outcome:** This course will establish the basic foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future. Experiments will help the Students to gather the experience of qualitative and quantitative chemical analysis. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.

### **Silicate Industries**

*Glass:* Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

*Ceramics:* Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

*Cements:* Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

(16 Lectures)

### **Fertilizers:**

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

(8 Lectures)

### **Surface Coatings:**

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

(10 Lectures)

**Batteries:**

Primary and secondary batteries, battery components and their role, Characteristics of battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

(6 Lectures)

**Alloys:**

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

(10 Lectures)

**Catalysis:**

General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogenous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts.

Phase transfer catalysts, application of zeolites as catalysts.

(6 Lectures)

**Chemical explosives:**

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

(4 Lectures)

## CHE-HE-6026: INDUSTRIAL CHEMICALS AND ENVIRONMENT

**(Credits: Theory-04, Lab-02)**

**Theory: 60 Lectures**

**Course Objectives:** This course provides an introduction to the various industrial gases and inorganic chemicals, their manufacturing processes, applications, storage and the hazards of handling them. Contribution of these industrial chemicals towards air and water pollution and their effects on living organisms and the environment has also been covered. Students are also expected to learn about metallurgy, energy generation industry and the pollution threat they pose. This course also discusses about management of the different kinds of wastes, **their** safe disposal and the importance of practicing green chemistry in chemical industry.

**Learning Outcomes:** After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly "green chemistry" in chemical industry.

### Industrial Gases and Inorganic Chemicals

*Industrial Gases:* Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, sulphur dioxide and phosgene.

*Inorganic Chemicals:* Manufacture, application, analysis and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassium permanganate.

(10 Lectures)

### Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology.

(4 Lectures)

### Environment and its segments



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