

## Eighth Semester

S.No.	Course Code	Course Title	Hrs./ Week			Credits
			L	T	P	
1	PCC – CE801	Digital Professional Skills	-	-	6	3
2	PEC – CE803	Departmental Elective-III	3	-	-	3
3	OEC – CE801	Open Elective-IV	3	-	-	3
4	PROJ – II	Project Phase -II	-	-	12	6
5	PROJ – CE801	Seminar-II	-	-	2	1
<b>Total Credits</b>						<b>16</b>

S.No.	Departmental Elective-III (PEC – CE803)	Open Elective-IV (OEC – CE801)
1	Construction Planning and Management	Disaster Management, Forecasting and Mitigation
2	Design of Advanced Steel Structures	Disaster Mgt, Laws, Policies and Regulations
3	Structural Dynamics	Occupation Health & First aid
4	Design of Prestressed Structures	Intellectual Property Rights
5	Ground Improvement Techniques	-

<b>PCC-CE801</b>	<b>Digital Professional Skills</b>	<b>0L:0T:4P (4 Hours)</b>	<b>2 Credits</b>
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**Objectives:**

To provide detailed knowledge of various modern tools used in the field of civil engineering.

Each student shall develop a good grasp on the modern tools (e.g. AutoCAD, MX Road, STAAD Pro, Primavera, etc.) used in field of civil engineering and shall submit a detailed report of their work done using one or more of these modern tools.

**Course Outcomes:**

**CO1:** To understand different tools and their applications.

**CO2:** To understand the importance of these tools in this era of modernization.

**CO3:** To comprehend the different methodologies involved with different tools.

**CO4:** To be able to correlate the design and planning procedures with their respective tools.

**CO5:** To master one or more tools extensively used for design, planning & analysis in the field of civil engineering.

<b>PEC – CE803</b>	<b>Construction Planning &amp; Management</b>	<b>3L:0T:0P (Hrs)</b>	<b>3 Credits</b>
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**Objectives:**The study of methods, tools and techniques for the planning, analysis and monitoring of the project site. Understand the various elements of the contracting and bidding process for construction. Various dispute resolution methodologies.

### **Module 1**

Preliminary and detailed investigation methods of construction, form work and centering. Schedule of construction, job layout CPM, principles of construction management, modern management techniques like CPMPERT with network analysis.

### **Module 2**

Construction equipments Factors affecting selection, investment and operating cost, output of various equipments, brief study of equipments required for various jobs such as earth work,dredging, conveyance, concreting, hoisting, pile driving, compaction and grouting.

### **Module 3**

Tenders & Contracts Different types of Tenders & Contracts, notice inviting tenders, contract document, departmental method of construction, rate list, security deposit and earnest money, conditions of contract, arbitration, administrative approval, technical sanction.

### **Module 4**

Specifications & Public Works Accounts Importance, types of specifications, specifications for various trades of engineering works. Various forms used in construction works, measurement book, cash book, materials at site account, imprest account, tools and plants, various types of running bills, secured advance, final bill.

### **Module 5**

Site Organization & Systems Approach to Planning Accommodation of site staff, contractor's staff, various organization charts and manuals, personnel in construction, welfare facilities, labour laws and human relations, safety engineering.

Problem of equipment management, assignment model, transportation model and waiting line models with their applications, shovel truck performance with waiting line method.

**Course Outcomes:**

Students will be able to

CO1. Understand investigation methods and principles of construction management.

CO2. Understand the selection of Construction equipment's.

CO3. Understand various elements of tenders & Contracts.

CO4. Know the different types of specifications and bills used in construction works.

CO5. Know about the site Organization & labour laws and safety engineering.

**Reference Books -**

1. Construction Equipment by Peurify
2. CPM by L.S. Srinath
3. Construction Management by S. Seetharaman
4. CPM & PERT by Weist & Levy
5. Construction, Management & Accounts by Harpal Singh
6. Tendering & Contracts by T.A. Talpasai

<b>PEC – CE803</b>	<b>Design of Advanced Steel Structures</b>	<b>3L:0T:0P (Hrs)</b>	<b>3 Credits</b>
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### **Objectives**

To analyze and design the special Steel structures using standard codal provisions and procedures.

### **Module 1**

Plate girder bridges (Riveted and welded)

### **Module 2**

Trussed girder bridges for railways and highways (IRC & IRS holding). Bearings for bridges.

### **Module 3**

Water Tanks: Pressed steel tanks, tanks with ordinary plates, square, rectangular, circular with hemispherical bottom and conical bottom.

### **Module 4**

Chimneys: Guyed and self supporting steel stacks.

### **Module 5**

Bunkers, Silos & Towers

**Course Outcomes:**

- CO1. Ability to analyze the forces existing in riveted or bolted plate girder bridges, design them using relevant code of practice and its detailing.
- CO2. To design truss girder bridges for railways and highways using standard codes of practice, to visualize the significance of various clauses for design and its detailing.
- CO3. To understand the design steps for different shapes of steel water tanks and its detailing.
- CO4. To visualize the design steps for different types of chimneys using relevant codes of practice and the detailing thereof.
- CO5. To understand the step by step procedure for the design of bunkers, silos and towers and its detailing using relevant code of practice.

**SUGGESTED TEXT BOOKS AND REFERENCES:**

1. Design of Steel Structures – S. Ramamrutham
2. Design of Steel Structures – B.C.Punmia
3. Steel Str. by Ramchandra Vol II
4. Steel Str. by Arya & Ajwani
5. Design of steel structures – L.S. Negi

PEC – CE803(C)	Structural Dynamics	3L:0T:0P (Hrs)	3 Credits
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**Objectives:** The objective of this course is to make students to learn principles of Structural Dynamics. To implement these principles through different methods and to apply the same for free and forced vibration of structures. To evaluate the dynamic characteristics of the structures

**Module 1** **(10 Hrs)**

**Introduction:** Introduction to Dynamic problems in Civil Engineering, Concept of degrees of freedom, D'Alembert's principle, principle of virtual displacement and energy principles Dynamics of Single degree-of-freedom systems: Mathematical models of Single-degree-of-freedom systems system, Free vibration response of damped and undamped systems. Methods of evaluation of damping.

**Module 2** **(10 Hrs)**

**Single-degree-of-freedom systems:** Response of Single-degree-of-freedom systems to harmonic loading (rotation unbalance, reciprocating unbalance) including support motion, vibration isolation, transmissibility, Numerical methods applied to Single-degree-of-freedom systems – Duhamel integral, principle of vibration-measuring instruments– seismometer and accelerometer.

**Module 3** **(10 Hrs)**

**Dynamics of Multi-degree freedom systems:** Mathematical models of multi-degree-of-freedom systems,

Shear building concept, free vibration of undamped multi-degree-of-freedom systems, Natural frequencies and mode shapes, orthogonality property of modes.

#### **Module 4**

**(10 Hrs)**

**Response of Shear buildings:** Response of Shear buildings for harmonic loading without damping using normal mode approach. Response of Shear buildings for forced vibration for harmonic loading with damping using normal mode approach, condition of damping uncoupling.

#### **Module 5**

**(10 Hrs)**

Approximate methods: Rayleigh's method **Dynamics of Continuous systems:** Dunkarley's method, Stodola's method. Dynamics of Continuous systems: Free longitudinal vibration of bars, flexural vibration of beams with different end conditions, Stiffness matrix, mass matrix (lumped and consistent); equations of motion for the discretised beam in matrix form.

#### **Course Outcomes:**

Students will be able to

CO1. Achieve Knowledge of design and development of problem solving skills.

CO2. Understand the principles of Structural Dynamics.

CO3. Summarize the Solution techniques for dynamics of Multi-degree freedom systems.

CO4. Understand the concepts of damping in structures.

CO5. Understand various methods involved in dynamics of continuous systems.

#### **Text/Reference Books:**

1. Anil K. Chopra, "Dynamics of Structures-Theory and Applications to Earthquake Engineering", Pearson, 3rd Edition, 2011.
2. Gary Hart and Kevin Wong, "Structural Dynamics for Structural Engineers", John Wiley And Sons, 2000.
3. J. W. Smith, "Vibration of Structures. Application in Civil Engineering Design", Chapman and Hall, 1988.
4. Jagmohan L.Humar, "Dynamics of Structures", Prentice Hall, 1990.



5. Mario Paz and William Leigh, “Structural Dynamics - Theory and Computation”, Updated With Sap 2000, 5th Edition, Kluwer Academic Publishers.
6. R. W. Clough and J. Penzien, “Dynamics of Structures”, Tata Mc Graw Hill, 2<sup>nd</sup> Edition, 2003.

<b>PEC – CE803</b>	<b>Design Of Prestressed Structures</b>	<b>3L:1T: 0P (Hrs)</b>	<b>3 Credits</b>
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**Objectives:** The objective of this course is to make students able to analyse sections using the basic aspects of prestressed concrete, determine losses in prestressed concrete and design of prestressed concrete structural elements.

**Module 1** **(12 Hrs)**

**Introduction – Theory and Behavior:** Basic concepts, Advantages, Applications, Types of prestressing, prestressing systems and methods, materials, losses in prestress, Introduction to IS 1343

**Module 2** **(10 Hrs)**

**Analysis of Flexural Members:** Analysis of sections: Stress concept – Strength concept – Load balancing concept, Basic assumptions for calculating flexural stresses & permissible stresses in steel and concrete as per I.S.1343 Code. Calculation of deflections – Short term and long term deflections, factors influencing deflections

**Module 3** **(10 Hrs)**

**Design of Statically determinate PSC members:** Design for ultimate and serviceability limit states for flexure, analysis and design for shear and torsion, code provisions

**Module 4****(10 Hrs)**

**Design of Statically indeterminate PSC members:** Analysis and design of two span continuous beams, choice of cable profile, concordant cable and linear transformation. Methods of achieving continuity in continuous beams & slabs. Analysis for secondary moments, calculation of stresses, principles of design & code provisions.

**Module 5****(10 Hrs)**

**End Block design & Miscellaneous Structures:** Transmission of prestress in pre-tensioned members, Magnel's method, Guyon's method and IS 1343 code. Determination of anchorage zone stresses for post-tensioned members – design of anchorage zone reinforcement. Design of tension and compression members, tanks, pipes, sleepers and poles.

**Course Outcomes:**

- CO1. Understand the basic concepts of prestressing.
- CO2. Analyse sections for obtaining stresses and deflection.
- CO3. Design statically determinate PSC members
- CO4. Design statically indeterminate PSC members.
- CO5. Design end block & miscellaneous structures.

**Text/Reference Books:**

1. Krishna Raju N., Prestressd Concrete, Tata Mc Graw Hill Book Co.Ltd. New Delhi.
2. Pandit.G.S. and Gupta.S.P., Prestressed Concrete, CBS Publishers and Distributers Pvt. Ltd.
3. Lin T. Y. and Ned H Burns., Design of Prestressed Concrete Structures, Wiley India Pvt. Ltd.
4. Dayaratran P., Prestressed Concrete Structures, Oxford & IBH Co., Delhi.
5. Rajagopalan.N, "Prestressed Concrete", Narosa Publishing House.
6. IS: 1343, Indian Standard code of Practice for Prestressed Concrete, Bureau of Indian Standards, New Delhi.
7. IS: 784, Indian Standard Specification for Prestressed Concrete Pipes, Bureau of Indian Standards, New Delhi.
8. IS: 3935 - Code of Practice for Composite Construction, Bureau of Indian Standards, New Delhi.

<b>PEC-CE803</b>	<b>Ground Improvement Techniques</b>	<b>3L:0T:0P (5hrs)</b>	<b>3 Credits</b>
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**Objectives:** After this course, the student is expected to identify basic deficiencies of various soil deposits and he/she be in a position to decide various ways and means of improving the soil and implementing techniques of improvement.

**Module 1 (10 Hrs)**

Introduction to Ground improvement techniques: – Purpose - Field compaction and deep compaction methods. Drainage and dewatering: - well point system, shallow & deep well system, vacuum method, electro osmosis method. Comparison between methods

**Module 2 (12 Hrs)**

Methods of stabilizations: – Mechanical – Cement - Lime - Bituminous - Chemical. Grouting:- basic functions- permeation-compaction-hydro fracture, classification of grouts- groutability ratio- properties of grouts - viscosity, stability, fluidity, rigidity, thixotropy, permanence Grouting applications : - seepage control in soil and rock under dams- seepage control in soil for cut off walls – stabilization grouting for underpinning.

**Module 3 (10 Hrs)**

Reinforced earth: - mechanism- types of reinforcing elements- reinforcement-soil interaction – applications-

reinforced soil structures with vertical faces Geosynthetics – types of geosynthetics – functions of geosynthetics – properties of geosynthetics.

#### **Module 4**

**(12 Hrs)**

Consolidation: - definition- Spring analogy of consolidation -classification- laboratory consolidation test- log p curve - coefficient of consolidation. Preloading techniques - comparison of compaction and consolidation.

Shear strength:- definition – theoretical considerations: Mohr’s stress circle, principal plane, principal stresses – Mohr-coulomb failure theory – the effective stress principle - measurement of shear strength - Direct shear test – advantages and disadvantages. Calculation of parameters from direct shear test data.

#### **Course Outcomes:**

Students will be able to

- CO1. To Understand the different ground improvement techniques .methods of stabilisation
- CO2. To Understand soil stabilization and methods of stabilisation
- CO3. To Understand the concept of reinforced soil and the basic concepts of geosynthetics
- CO4. To Understand the basic concept of consolidation and the basic concepts of shear strength of the soil.

#### **Text/Reference Books:**

- 1.Moseley M.P., Ground Improvement Blockie Academic and Professional, Chapman and Hall, Glasgow, 1993.
- 2.Jones J.E.P., Earth Reinforcement and Soil Structure, Butterworths, 1995.
- 3.Koerner, R.M., “Design with Geosynthetics”, (3rd Edition) Prentice Hall, New Jersey, 2002
- 4.Jewell, R.A., “Soil Reinforcement with Geotextiles”, CIRIA special publication, London, 1996
- 5.Das, B.M., “Principles of Foundation Engineering”, Thomson Books / Cole, 2003.

<b>OEC – CE801</b>	<b>Disaster Management, Forecasting and Mitigation</b>	<b>3L:0T:0P (3Hrs)</b>	<b>3 Credits</b>
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**Objectives:** To familiarize the Students with the concepts and developments in the field of Disaster Management and to learn about the nature and characteristics of major natural disasters and how to mitigate the risk involved with such disasters

**Module 1 (08 Hrs)**

**Introduction** Definition; Types of disasters; History of disasters; Components of disaster; Dimension of disasters; Phases of disaster. The necessity of studying Disaster Management (DM); the scope for a Disaster Manager

**Module 2 (08 Hrs)**

**Hazards & Vulnerability:** Hazard: Definition; types of hazards; characteristic features, occurrence and impact of Different types of hazards viz. natural hazards (including geo hazards), human Induced hazards, environmental hazards, bio hazards; Hazard map of India. Vulnerability: Definition; Types of vulnerability – physical vulnerability, socioeconomic vulnerability, vulnerability related to gender and age, rural & urban vulnerability; Vulnerability analysis with special reference to India.

**Module 3 (08 Hrs)**

**Forecasting:** Pre-disaster, during disaster and post-disaster measures in some events in general, early warning: Risk analysis, Monitoring Response capability. Communication and information technology in disaster management. Do's and don'ts in case of disasters and effective implementation of relief aids.

#### **Module 4**

**(08 Hrs)**

**Disaster Risk:** Assessing Disaster Risk: Disaster Risk and Damage potential of disasters; Case studies on some major disasters and Lessons learnt there from (identification of the gaps causing the disasters); Assessment of Disaster Risk. Ways of minimizing disaster risk: Preparedness, Mitigation and Prevention – definition, specific interventions required for each, procedure to be followed and role of various stakeholders in each.

#### **Module 5**

**(08 Hrs)**

**Disaster Risk Mitigation:** Earthquake Risk Mitigation; Earthquake, its Causes and Characteristic features, Magnitude and Intensity of earthquake, Major earthquakes, Seismic zoning, Earthquake vulnerability of India, Earthquake risk mitigation. Flood Risk Mitigation: Causes of Flood, Major floods, Flood vulnerability of India, Flood preparedness and mitigation. Cyclone Risk Mitigation: Causes of Cyclone, its characteristics, Cyclone vulnerability of India, Cyclone preparedness, Forecast and early warning dissemination. Drought Risk Mitigation: Causes and characteristics of Drought, drought vulnerability of India, Drought preparedness and Mitigation. Landslide Risk Mitigation: Causes and Characteristics of Landslides, Landslide vulnerability of India, Mitigation measures, Prevention measures.

#### **Course Outcomes:**

CO1. To understand basic Concept and Phases of Disaster Management

CO2. To know about hazards and vulnerability concepts.

CO3. To understand the different methods of Disaster Forecasting

CO4. To know about the assessing of Disaster Risk

CO5. To understand the mitigation of different Risk of Disaster

#### **Text/Reference Books:**

1. Bryant Edwards; “Natural Hazards” Cambridge University Press, U.K. (2005)
2. Carter, W. Nick; “Disaster Management” Asian Development Bank, Manila (1991).

3. Central Water Commission; “Flood Atlas of India” CWC, New Delhi. (1987)
4. Central Water Commission; “Manual of Flood Forecasting” New Delhi. (1989)
5. Government of India; “Vulnerability Atlas of India” New Delhi. (1997)
6. Sahni, Pardeep et.al.; (eds.), “Disaster Mitigation Experiences and Reflections” Prentice Hall of India, New Delhi (2002)

<b>OEC – CE801</b>	<b>Disaster Mgt, Laws, Policies and Regulations</b>	<b>3L:0T:0P (3Hrs)</b>	<b>3 Credits</b>
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**Objectives:** To familiarize the Students with the concepts and developments in the field of Disaster Management and to learn about Laws, Policies and Regulations of Disaster.

**Module 1 (08 Hrs)**

**Introduction:** Definition; Types of disasters; History of disasters; Components of disaster; Dimension of disasters; Phases of disaster. The necessity of studying Disaster Management (DM); the scope for a Disaster Manager Hazard & Vulnerability.

**Module 2 (08 Hrs)**

**Types of Disaster:** Natural Disaster and Manmade disasters: Natural Disasters: nature of natural disaster, drought, cloud burst, Earthquake, Landslides, Cyclone, Storm Surge, climate change, global warming, sea level rise, Manmade Disasters: Chemical, Industrial, Nuclear and Fire Hazards. Study of Disasters related to Construction Industry: Fire, Flood, Airport, Dam, and Bridges.

**Module 3 (08 Hrs)**

**Disaster Management Policy Environment and local Action:** Disaster Management Act 2005; Disaster Management Authority at National, State and District levels; Roles and responsibilities of Govt. Authorities

including Local Self Govt. at various Levels.

#### **Module 4**

**(08 Hrs)**

**Funding for Disaster Management:** State Disaster Mitigation fund, State Disaster response fund (SDRF), National Disaster Response Fund (NDRF), Prime Minister National Relief Fund (PMNRF), Chief Minister Relief Fund and Role.

#### **Module 5**

**(08 Hrs)**

**Capacity Building:** Setting up EOCs at state, district and block levels; Raising National/State Disaster Response Force; Training and Capacity building of all stakeholders – National Institute of Disaster Management (NIDM); Disaster Management Centres (DMC) in every State; Centres of Excellence

#### **Course Outcomes:**

CO1. To understand the basic Concept and Phases of Disaster Management

CO2. To know the various types of Disasters.

CO3. To know various government policies in Disaster management.

CO4. To know various government funding in Disaster management

CO5. To know about the Disaster management Institutions

#### **Text/Reference Books:**

1. Damon P Capolla; “Introduction to International Disaster Management” Butterworth Heinemann Publ. (2007)
2. Paritosh Srivastava; “Disaster Management: Disaster Management and Mitigation approaches in india” (2014)
3. R B Singh; “Natural Hazards and Disaster Management: Vulnerability and Mitigation” 2006.
4. NDMA; “Disaster Management Guidelines” (2007).
5. Ministry of Home Affairs (NPDM); “National Policy on Disaster Management” (2006).



<b>OEC-CE801</b>	<b>Occupation Health &amp; First aid</b>	<b>3L (5hrs)</b>	<b>3Credits</b>
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**Objectives:** Student's will perform various activities related to Safety management like performing Risk Assessment & developing control strategies- implement Safe Systems of Work- develop work method statements thereby gaining professional hands-on experience in their chosen area.

### **Module 1**

**Safety Management** Introduction to safety and safety management - Accident causation – Hazard – Trigger – Risk – Heinrich Triangle – Frank Bird Triangle - Domino Theory – General Instructions for safety – Industrial safety practices – classification of accidents – Terms and definitions- General Safety rules

### **Module 2**

**Risk Management** Risk Analysis & Risk Management – Principles of hazard identification – Hazard analysis & risk control – Quantitative & qualitative assessment - Carrying out a Risk assessment - Preventive and protective measures – Process safety management - Safe Systems of Work – Permit to Work Systems

### **Module 3**

**Maintenance of Fire Protection Systems** Fire extinguishing appliances. Selection- requirements- installation and maintenance of hand appliances. Mechanically driven fire engines and trailer pumps. Hydrant system- pumps- Fuel System- Fixed monitors- Hose pipes and Nozzles- Maintenance of pumps- Hydrant's hose pipes and nozzles.

## **Module 4**

**Structural Hazards** Building design – Location of buildings and service functions – designing building to protect against explosions – building and hazard identification – building evaluation – risk reduction measures for building – building design to protect against toxic release – design for emergency egress – checklist for evaluation

## **Module 5**

**Introduction** – Scaffolding in construction -Terminology – Types of scaffolding – Scaffolding Hazards – Risk Assessment, Parts of Scaffolding – Ground – Sole Board - Base Plate – Screw Jack – Post – Runner – Bearer – Bracing – Guard Rail – couplings – Platform – Castor – Toe Board – Standards and specifications of all the parts - Management & Control of Scaffolding – Lay out & design, Capacity- Load calculation – Access – Fall protection – Falling object protection – Tube & coupler – Frame – System – suspended - outrigger – Mobile Scaffolds

## **Course Outcomes:**

- CO1: To know about the industry related health hazards and diseases and various methods and process implementation to avoid and eliminate health hazards.
- CO2: To understand the fundamentals of Safety Management like the scope and nature of occupational health and safety
- CO3: To understand broad aspects of Safety Management like the PDCA cycle- HSEMS- OHSAS 18001 Management System- Policy- Organising- Planning & Implementing- Evaluation- Action for Improvement- Audit- Safety Culture & Legal aspects of Safety
- CO4: To familiarize the design- installation- working and use of different types of Fire protection systems for low and high residential- commercial and public buildings
- CO5: To apply safety and health related theory and technology- analyze workplaces to identify occupational hazards- formulate solutions to control occupational hazards- collaborate with others in their respective organizations to minimize occupational hazards.

## **Text/Reference Books:**

1. Industrial Safety Management – LM Deshmukh
2. Construction Safety Hand Book – K Muraleedharan Pillai
3. To familiarize students with the design- installation- working and use of different types of Fire protection systems for low and high residential- commercial and public buildings
4. OHSAS 18001: Designing and Implementing an Effective Health and Safety Management System (Paperback) - Joe Kausek

<b>OEC – CE801</b>	<b>Intellectual Property Rights</b>	<b>3L:0T:0P</b>	<b>3 credit</b>
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**Objective:** Acquaint the students with the basic concepts of Intellectual Property Rights; and sensitize the students with the emerging issues in IPR and the rationale for the protection of IPR.

**Module 1** **(10 Hrs)**

**Introduction to IPR:** Introduction and Justifications of IPR, Nature of IP, Major forms of IP- Copyright, Patent, Trade Marks Designs, Geographic indication, layout design of Semi conductors, Plant varieties, Concept & Meaning of Intellectual Property. Major international documents relating to the protection of IP - Berne Convention, Paris Convention, TRIPS. The World Intellectual Property Organization (WIPO).

**Module 2** **(10 Hrs)**

**Copyright infringement:** Copyright Meaning and historical development of copyright , Subject matter , Ownership of copyright, Term of copyright, Rights of owner, Economic Rights, Moral Rights. Assignment and licence of rights, Infringement of copyright, Exceptions of infringement, Remedies, Civil, Criminal, Administrative, Registration Procedure.

**Module 3** **(10 Hrs)**

**Patents and importance:** Patents Meaning and historical development,. Criteria for obtaining patents, Non patentable inventions, Procedure for registration, Term of patent, Rights of patentee, Compulsory licence, Revocation, Infringement of patents, Exceptions to infringement, Remedies, Patent office and Appellate

Board.

#### **Module 4**

**(10 Hrs)**

**Trade Marks:** Trade Marks, Designs & GI Trade Marks: Functions of marks, Procedure for registration, Rights of holder, Assignment and licensing of marks, Infringement, Trade Marks Registry and Appellate Board. **Designs:** Meaning and evolution of design protection, Registration, Term of protection, Rights of holder, unregistered designs. **Geographical Indication:** Meaning and evolution of GI, Difference between GI and Trade Marks, Registration, Rights, Authorised user.

#### **Module 5**

**(10 Hrs)**

**E-commerce and IPR issues:** Contemporary issues & enforcement of IPR , IPR & sustainable development , The impact of internet on IPR. IPR issues in biotechnology, E-commerce and IPR issues, Licensing and enforcing IPR , case studies in IPR.

#### **Course Outcomes:**

CO 1. Students will be able to understand Primary forms of IPR

CO 2. Students will be able to assess and critique some basic theoretical justification for major forms of IP Protection

CO3. Students will be able to compare and contrast the different forms of IPR in terms of key differences and similarities.

CO 4. Students will be able understand the registration procedures related to IPR.

CO 5. Students will be exposed to contemporary issues and enforcement policies in IPR.

#### **Text/Reference Books:**

1. Neeraj Pandey and Khushdeep Dharni, “Intellectual Property Rights”, PHI, 2014
2. N.S Gopalakrishnan and T.G. Agitha, “Principles of Intellectual Property”, Eastern Book Co. Lucknow, 2009.
3. Prabuddha Ganguli, “ Intellectual Property Rights” Mcgraw Hill Education, 2016.