

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE484	APPLIED EARTH SYSTEMS	3-0-0-3	2016

**Prerequisites:** Nil

**Course objectives:**

- Appreciation of earth as a system of interrelated components
- Understanding mechanisms that give rise to oceanographic and atmospheric phenomena
- Comprehension of processes that result in characteristic land features in different climatic regimes

**Syllabus :**

Fundamental concepts of equilibrium - Geomorphic agents and processes -Earth systems -climate change - Weathering- Fluvial processes- Stages of stream development- Drainage patterns - Soil- Deserts- Wagner's ideas of continental drift, Plate Tectonics- Basics of oceanography-. Basic ideas about plankton and primary productivity -Basics of atmosphere and atmospheric processes - Heat budget- Fundamental concepts of precipitation, global wind patterns.

**Expected Outcomes:**

- The students would understand the roles of surface and sub surface phenomena in shaping surface features of earth
- The course would appreciate the ramifications of any atmospheric, oceanographic or land process on other component subsystems including biosphere.

**Text Books / References:**

1. Critchfield H J ,*General Climatology* Prentice Hall, New Delhi, 1983
2. Fetter C W, *Applied Hydrogeology* CBS New Delhi, 1990
3. Carlson, D H, Plummer, CC and McGreary, D, *Physical geology: Earth Revealed* McGraw Hill, New York, 2006
4. Pinet P R, *Oceanography – An Introduction to the Planet Oceanus*, West Publishing Co., 1992
5. Valdiya K S, *Environmental Geology: Ecology, Resource and Hazard Management* McGraw-Hill Education (India) Private Limited, New Delhi, 2013

COURSE PLAN			
Module	Contents	Hours	End Sem. Exam Marks %
I	Fundamental concepts of equilibrium. Geomorphic agents and processes. Basic concept of Earth as a system and its component sub systems. Climate Change vis-a-vis the interrelationships of the subsystems- Green House Effect and Global warming, basic ideas about their causes and effects.	7	15
II	Weathering- relevance, influence of and on earth systems, types and controlling factors Fluvial processes-hydrological cycle, fluvial erosion, transportation and deposition, fluvial landforms. Stages of stream development; Drainage patterns.	7	15
<b>FIRST INTERNAL EXAMINATION</b>			
III	Soil- formation and controls, soil profile, soil erosion and conservation methods. Deserts-distribution and controls.	7	15
IV	Wagner's ideas of continental drift, Plate Tectonics- seafloor spreading. Plate boundaries and their features, mechanisms of plate movements.	7	15
<b>SECOND INTERNAL EXAMINATION</b>			
V	Basics of oceanography: coastal upwelling and downwelling. Outlines of ocean floor topography, Brief account of marine sediments, turbidity currents, basic outlines of origin and circulation of deep sea surface currents (Atlantic and Pacific Oceans), coral reefs- types and concepts about their formation. Basic ideas about plankton and primary productivity.	7	20
VI	Basics of atmosphere and atmospheric processes: Structure and composition of the atmosphere. Heat budget, factors affecting solar radiation. Fundamental concepts of precipitation, global wind patterns.	7	20
<b>END SEMESTER EXAMINATION</b>			

### QUESTION PAPER PATTERN (End Semester Exam)

**Maximum Marks : 100**

**Exam Duration: 3 Hrs**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a,b,c,d)