**COURSE CODE : CH1C03**

**COURSE TITLE** : **ENGINEERING CHEMISTRY II**

**UNIVERSITY : DIBRUGARH UNIVERSITY**

**SEMESTER : SECOND SEMESTER**

**CREDIT : 04**

**L:T:P : 3:1:0**

**End sem. Examination for this course will carry 100 marks**

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| Module | Details of module | No. of Lectures |
| 1 | Electrochemistry covering Conductance, cell constant and its determination. Single electrode potentials, electrolytic and galvanic cells. Emf series , nernst equation , cell emf measurement , reversible and irreversible cells | 06 |
| 2 | Corrosion covering Definition and scope of corrosion , direct chemical corrosion , and electrochemical corrosion and its mechanisms. Types of electrochemical corrosion (differential aeration, galvanic, concentration cell). Typical electrochemical corrosion like pitting, inter – granular, soil, waterline. Factors affecting corrosion, protection of corrosion. Applications with few practical problems of corrosion. | 08 |
| 3 | Energy sciences covering fuels (conventional) – types of fuels. Calorific value, determination of calorific value. Refining of petroleum , liquid fuel s , fuels for ic engines , knocking and antiknock agents , octane and cetane values , cracking of oils , alternative sources of energy , limitations of fossil fuels. Non - conventional sources of energy – advantages and disadvantages. Nuclear energy production from nuclear reactions, brief idea of nuclear reactor. Battery technology -- fundamental of primary cells , rechargeable batteries , ni – cd , ni - metal hydride . Fuel cells -- principles, applications, advantages and disadvantages. | 10 |
| 4 | Nanomaterials covering introduction , fullerenes , carbon nano tubes , nanowires : electronic and mechanical properties . Application of nanomaterials -- catalysis , electronics and telecommunications , medicines , composites , energy sciences . Fundamentals of nanomaterials. | 06 |
| 5 | Environmental chemistry covering air pollution, noise pollution, optimum decibel levels, water pollution. Determination and significance of cod, bod ,toc . Numerical problems. Solid waste treatment and collection of nkp. Green house effect and global warming. E – Waste and radioactive pollution. Role of electromagnetic radiation in global warming. | 10 |
| 6 | Metals and alloys covering Gibb’s phase rule , phase rule application to water , two component system s – pb – ag / fe – c phase equilibrium diagram. Types of alloys – ferrous and non- ferrous alloys. Carbon steel, alloy steel. Alloys of cu, al ,pb . | 05 |