**ACADEMIC LESSON PLAN FOR I SEMESTER 2023-24**

**SUBJECT: APPLIED CHEMISTRY –I**

**SEMESTER: FIRST SUBJECT CODE: BS-103**

TOTAL TEACHING WEEKS: 15 WEEKS L T CREDITS

TOTAL LECTURE CLASSES: 30 2 1 3

TOTAL TUTORIAL CLASSES: 15

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| S. No. | **Topics to be covered** | No. of Lectures | No. of Tutorials |
| **Unit: 1 FUELS (8hrs)** | | | |
| 1  2 | Definition, Classification, calorific value of fuels , (gross and net) Determination of calorific value of fuels, bomb calorimeter, (Related Numericals ) | 1  1 | 1 |
| 3  4 | Boy’s Gas calorimeter, Dulong’s Formula, (Related Numericals) Solid fuels – Proximate and ultimate analysis, Related numericals | 1  1 | 1 |
| 5  6 | High & Low temperature carbonization, Manufacture of coke (Otto Hoffmann oven)  Combustion of Fuels (Related Numericals) | 1  1 | 1 |
| 7  8 | Gaseous and Liquid fuel. Cracking – thermal & catalytic cracking.  Knocking, Octane & Cetane No. and its significance. | 1  1 |  |
| **Unit II - THE PHASE RULE and POLYMERS (6hrs)** | | | |
| 9  10  11 | Definition of different Terms. Gibb’s phase Rule  Application of phase rule to one component system -The water system and Sulphur system  Application of phase rule to two component system-Lead –Silver System (Pattison’s Process), Zn-Mg system | 1  1  1 | 1 |
| 12  13 | Classification, functionality and types of polymers.  Synthesis and Properties of various types of polymers. | 1  2 | 1 |
| **Unit: III WATER (9 hrs)** | | | |
| 14 | Introduction and specifications of water  Hardness and its determination (EDTA) method only), Related Numericals | 1 | 1 |
| 15  16 | Alkalinity and its determination, Related Numericals  Boiler feed water, Boiler Problem: Scale, Sludge, Priming and Foaming, Caustic Embrittlement and Corrosion: Causes and Prevention | 1  1 | 1 |
| 17  18 | Introduction and specifications of water  Hardness and its determination (EDTA) method only), Related Numericals | 1 | 1 |
| 19  20 | Alkalinity and its determination, Related Numericals  Boiler feed water, Boiler Problem: Scale, Sludge, Priming and Foaming , Caustic Embrittlement and Corrosion: Causes and Prevention | 1  1 | 1 |
| 21  22 | Water softening by Internal Treatment; Carbonate & Phosphate Conditioning, Colloidal and Calgon Conditioning,  Water Softening by External Treatment : Lime Soda Process and related numerical | 1  1 | 1+1 |
| 23  24 | Zeolite & Ion –Exchange Process.  Reverse Osmosis, Electrodialysis , Disinfection by break-point chlorination | 1 |  |
| **Unit: IV CORROSION AND ITS CONTROL, GREEN CHEMISTRY AND NANO TECHNOLOGY (7 hrs)** | | | |
| 25 | Causes, effects & consequences; Chemical or Dry corrosion & its mechanism (Pilling – Bedworth Rule)  Electrochemical or Wet Corrosion & its mechanism | 1 | 1 |
| 26 | Rusting of Iron Passivity, Galvanic series Galvanic Corrosion  Soil Corrosion Pitting Corrosion, Concentration Cell or Differential Aeration Corrosion, Stress Corrosion | 1 |  |
| 27 | Factors Influencing Corrosion: Nature of metal and nature of corroding environment  Protective measures: Galvanization, Tinning | 1 | 1 |
| 28 | Cathodic Protection, Sacrificial Anodic protection, Electroplating Electroless plating  Prevention of Corrosion by Material selection & Design | 1 | 1 |
| 29 | Green Technology and Green Chemistry-Introduction and 12 Principles | 1 |  |
| 30 | Green Technology and Green Chemistry-Various applications.  Introduction to Nano-Technology | 1 | 1 |
| 31 | Properties, Synthesis, characterization techniques and applications | 1 |  |

**Note: Unit I & II will be covered before Sessional Exams.**

**In respect of Text and Reference Books, the approved Scheme and Syllabus of 1st Semester of B. Tech Programme may be referred**