

Indian Oil Corporation Limited

Registered Office: IndianOil Bhavan, G-9, Ali Yavar Jung Marg, Bandra (East), Mumbai -
400 051

Syllabus for Diploma Electrical (Grade E0)

1. Introduction to Electric Generation Systems
2. Electrical Circuit Theory
3. Electrical Machines
4. Electronic Devices and Circuits
5. Power Electronics
6. Electrical and Electronic Measurements
7. Digital Electronics
8. Transducers and Signal Conditioners
9. Electric Power Transmission and Distribution
10. Microcontroller, Programmable Logic Controller and Microprocessor
11. Electrical estimation, Energy Auditing and Energy Conservation
12. Electrical Properties of Materials
13. Electrical Machine Controller
14. Control Systems – Analysis and modelling
15. Signals and Systems
16. Illumination practices
17. Building Electrification
18. Renewable Energy Power Plant

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Syllabus for Diploma Instrumentation (Grade E0)

1. Electronic Devices and Circuits
2. Electrical Circuits and Machines
3. Basics of Instrumentation
4. Analog and Digital Electronics
5. Measurements and Instruments
6. Measurement of Process Variables
7. Industrial Instrumentation
8. Process Control Instrumentation
9. Control Engineering
10. Instrumentation System Design
11. Programmable Logic Controllers

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Syllabus for Diploma Mechanical (Grade E0)

1. Basic Mechanical Engineering
2. Computer Aided Machine Drawing
3. Material Science and Engineering
4. Fluid Mechanics and Hydraulic Machinery
5. Manufacturing Engineering
6. Thermal Engineering
7. Measurements & Metrology
8. Strength of Materials
9. Advanced Manufacturing Processes
10. Theory of Machines & Mechanisms
11. Industrial Engineering & Management
12. Design of Machine Elements
13. Production and Operations Management
14. Pneumatic Tools and system

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Syllabus for Diploma Chemical (Grade E0)

1. Chemical Engineering Fundamentals

- Basic Principles (Stoichiometry) of Chemical Engineering
- Chemical Thermodynamics
- Fluid Mechanics and Mechanical Operations
- Heat Transfer
- Mass Transfer
- Chemical Reaction Engineering
- Process Control and Instrumentation

2. Petroleum Refining Processes

- Crude Oil properties and refining objectives
- Distillation Processes (atmospheric and vacuum distillation)
- Catalytic reforming and Isomerization
- Fluid catalytic cracking (FCC)
- Hydrocracking and hydrotreating
- Alkylation, Isomerization
- Refinery utilities (cooling water systems, steam systems etc.)

3. Petrochemical Processes

- Basics of Petrochemicals
- Steam cracking and ethylene production
- Polymerization processes (Polypropylene, polyethylene)
- Aromatics production (Benzene, Toluene, Xylene)
- Olefins and derivatives (propylene, butadiene etc.)
- Production of various petrochemical intermediates

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4. Process Equipment and Operations

- Operation and control of Pump Houses
- Fired Heaters: Types and operations
- Compressors: Types and operations
- Distillation Columns: Tray and packed columns, operations
- Reactors: Types and operations
- Heat Exchangers: types, operations and maintenance

5. Safety and Environment

- Process Safety Management
- Job Safety Analysis (JSA), HAZOP
- Hazard Identification and Risk Assessment
- Safety in handling hazardous materials
- Environmental regulations and considerations in a refinery/petrochemical plant