1. Electrical Machine.
   1.1 Transformers and Instrument Transformers
   1.2 DC Machine: generators and motors
   1.3 Synchronous Generators.
   1.4 Synchronous Motor.
   1.5 Induction Motor
   1.6 Induction generator.

   2.1 High voltage Transmission System
   2.2 Load flow study.
   2.3 Power system stability.
   2.4 Steady-state stability implications, series and shunt compensation.
   2.5 Performance of transmission lines- short, medium and long lines.
   2.6 Surge impedance and surge impedance loading of transmission lines.
   2.7 Skin effect, corona.
   2.8 Load dispatching.
   2.9 Demand Side Management.
   2.10 Single-phase and three-phase distribution system.
   2.11 Rural distribution system.
   2.12 Protection coordination in distribution system.
   2.13 Quality of electricity.

3. Control and Protection.
   3.1 Types of fault in power system
   3.2 Fault calculation
   3.3 Principles of power system protection.
   3.4 Isolators and contractors
   3.5 Circuit breakers: Vacuum, air, oil and SF₆
   3.6 Types of relays.
   3.7 Protection of generators, transformers and transmission/distribution lines.
   3.8 Earthing and shielding technique.
   3.9 Lighting protection.

4. Rural Electrification
   4.1 Electricity and rural development
   4.2 Technology and approaches for rural electrification.
   4.3 Role of micro and mini hydropower, solar power.

5. Power Electronics.
   5.1 Power electronics device.
   5.2 Single phase and three-phase ac to dc conversion.
   5.3 Single phase and three phase dc to ac conversion
   5.4 HVDC power transmission.

6. Power Plants.
   6.1 Hydropower potential
   6.2 Hydropower plant.
   6.3 Substation layout.
   6.4 Turbine types and application.
   6.5 Pumped storage plant.
   6.6 Environmental impacts of steam, gas, nuclear, wind and solar power plants.
7. **Instrumentation.**
   7.1 Theory of measurements.
   7.2 Transducers.
   7.3 Electrical signal transmission and processing.
   7.4 Non-electrical signal transmission.
   7.5 Digital instrumentation.
   7.6 Recording instrument.

8. **Safety Engineering.**
   8.1 Effects of non-ionizing magnetic fields on human body.
   8.2 Physical effect of electric shock.
   8.3 Safety rules and regulations.
   8.4 Safety tools and devices.
   8.5 Earthing and shielding technique.
   8.6 Fire hazards.
   8.7 Fire fighting techniques and equipment.
   8.8 Noise hazard.

9. **Engineering Economics**
   9.1 Cash flow analysis.
   9.2 Project evaluation indicator
   9.3 Payback period.
   9.4 Risk analysis.
   9.5 Taxation system in Nepal.
   9.6 Energy Tariff.

10. **Project Management**
   10.1 Project Planning and Scheduling.
   10.2 Capital Planning and Budgeting.
   10.3 Project Monitoring and control.

11. **Organizational Management.**
   11.1 Internal Organization.
   11.2 Management Information System.
   11.3 Motivation and Leadership.
   11.4 Personal Management.
   11.5 Familiarization with procurement guidelines and standard of World Bank, ADB.
   11.6 Preparation of Contract documents, specifications, condition of contract and other contractual procedure.

12. **Electric Energy System Management.**
   12.1 Electric Power Utility Organization.
   12.2 Economic Analysis and Control of Power Utility.
   12.3 Prediction of Electric Load Levels and Changes.
   12.4 Scheduling to Meet Generation Requirements.
   12.5 Real-time Economic assessment of generation and energy dispatch.
   12.6 Concept of Grid Code