AMEL19 ADVANCE POWER SYSTEM & DESIGN

UNIT-1 INTRODUCTION

1.1 A Perspective, Structure of power systems, Conventional Sources of Electric Energy,
1.2 Renewable Energy Sources, Energy Storage, Growth of Power Systems in India.

UNIT-2 REPRESENTATION OF POWER SYSTEM

2.1 Single-phase Solution of Balan Three-phase Networks,
2.2 One Line Diagram and Impeded Reactance Diagram, Per unit (PU) System,
2.3 Complex Power, Synchronous Machine.

UNIT-3 REPRESENTATION OF LOADS, LOAD FLOW STUDIES:

3.1 Y'bus by singular Transformation, Load flow problem, Gauss-seidel Method,
3.2 Optical system Operation, Automatic Generality voltage Control, Symmetrical F2 Analysis.

UNIT-4 SYMMETRICAL COMPONENTS

4.1 Symmetrical Component Transformation, Phase Shift in star Delta Transformers,
4.2 Sequence Impedances of transmission Lines,
4.3 Sequence Impedances and Sequence Network of power System,
4.4 Sequence Impedances and Networks of Synchronous Machine,
4.5 Sequence Impedances of Transmission Lines, Sequence Impedances of Transmission Lines,
4.6 Sequence Impedances and Networks of Transformers,
4.7 Construction of sequence Networks of a power System.

UNIT-5 UNSYMMETRICAL FAULT ANALYSIS

5.1 Symmetrical Component analysis of Unsymmetrical Faults,
5.2 Single Line-To-Ground (LG) Fault, Line-To-Line (LL) Fault,
5.3 Double Line-To-Ground (LLG) Fault, Open Conductor Faults,
5.4 Bus Impedance Matrix Method for Analysis of Unsymmetrical Shunt Faults.

UNIT-6 POWER SYSTEM STABILITY

6.1 Dynamics of a Synchronous Machine, Power Angle Equation,
6.2 Node Elimination Technique, Simple Systems, Numerical Solution of swing Equation,
6.3 Multimachine Stability, Some Factors Affecting Transient Stability.

UNIT-7 POWER SYSTEM SECURITY

7.1 System State Classification, Security Analysis,
7.2 Contingency Analysis, Sensitivity Factors,
7.3 Power System Voltage Stability.

Reference Book:

1. Sub Station Engineering Design, Publisher Katsons, Writer R S Dahiya