MODULE TITLE: PROCESS SYSTEMS ENGINEERING

MODULE NUMBER: CHEG 7131
ECTS: 7

COURSE OUTLINE:

1. **INTRODUCTION PROCESS SYSTEMS ENGINEERING**

      1.1. THE CONCEPT OF SYSTEMS ENGINEERING

      1.2. THE PARADIGMS OF PROCESS SYSTEMS ENGINEERING

2. **PROCESS MODELING AND SIMULATION**

      2.1. SYSTEMATIC APPROACH TO MODEL BUILDING

      2.2. DYNAMIC MODELS-LUMPED PARAMETER SYSTEMS

      2.3. DYNAMIC MODELS-DISTRIBUTED PARAMETER SYSTEMS

3. **ADVANCED PROCESS MODELLING AND MODEL ANALYSIS**

      3.1. BASIC TOOLS FOR PROCESS MODEL ANALYSIS

      3.2. DATA ACQUISITION AND ANALYSIS

      3.3. STATISTICAL MODEL CALIBRATION AND VALIDATION

      3.4. ANALYSIS OF DYNAMIC PROCESS MODELS

4. SYNTHESIS OF MASS EXCHANGE NETWORKS

5. SYNTHESIS OF HEAT EXCHANGE NETWORKS

REFERENCES

1. W. D. SEIDER, J. D. SEADER, D. R. LEWIN, AND S. WIDAGDO, PRODUCT AND PROCESS DESIGN PRINCIPLES: SYNTHESIS, ANALYSIS AND DESIGN (WILEY, 2008)

2. ROBIN SMITH, CHEMICAL PROCESS DESIGN AND INTEGRATION (JOHN WILEY & SONS LTD., 2005).

3. KATALINE HANGOS AND IAN CAMERON, PROCESS MODELLING AND MODEL ANALYSIS, ACADEMIC PRESS, UK, 2001.

4. Wymore, W. A., Model-Based Systems Engineering, CRC Press Inc., Boca Raton FL, Chapter 1, 1993