SYE3004: PRODUCTION PLANNING AND CONTROL

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Production Planning and Control

Subject Code
SYE - Systems Engineering
Course Number
3004

Academic Unit
Systems Engineering (SYE)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
MA1201 Calculus and Basic Linear Algebra II or MA1301 Enhanced Calculus and Linear Algebra II

Equivalent Courses
ADSE3004 Production Planning and Control

Exclusive Courses
Nil

Part II Course Details

Abstract

In this course, students will learn essential concepts and skills for planning and controlling production and the associated operations. Students will learn the elements of various production management techniques and their practical implementation issues in product realization and logistics.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Develop aggregate production plan, master production schedule, material requirement and logistics plan, and capacity requirement plan for industrial applications.	20	x		
2	Make basic demand forecasting (such as moving averages, Holt's methods, Winters' method, regression analysis) for various types of demand patterns.	20	x		
3	Apply basic techniques of inventory monitoring and control (EOQ model with its various extensions) in production planning and control.	20	x		
4	Schedule operations at a work center under operational constraints, and Optimize facilities layout and location.	20	x		
5	Formulate models in industrial settings for analyzing problems arising from production planning and logistics, operations scheduling, material handling and transportation planning, and find optimal solutions to these problems. Create/use computer software to automate these operations.	20	x		

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students will engage in lectures and discussions to gain knowledge about the principles and industrial applications of different production planning and control techniques.	1, 2, 3, 4, 5	3 hours/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Tests and Assignments	1, 2, 3, 4, 5	50	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

Assessment Rubrics (AR)

Assessment Task

Homework sets and Test

Criterion

Submitted written work

Excellent (A+, A, A-)

For all 5 CILOs, strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

For at least 4 out of 5 CILOs, evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair (C+, C, C-)

For at least 4 out of the 5 CILOs, evidence that student is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material

Marginal (D)

For at least 4 out of the 5 CILOs, sufficient familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited, or irrelevant use of literature.

Assessment Task

Examination

Criterion

Submitted written work

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Part III Other Information

Keyword Syllabus

Aggregate production planning. Master production scheduling. Material requirement and logistics planning. Capacity planning. Basic demand forecasting techniques. Job scheduling. Basic production control and inventory management. Facilities design and location. Material handling. Introduction to enterprise resource planning systems.

Reading List

Compulsory Readings

	Title
1	Lecture notes and slides provided by the instructor

Additional Readings

	Title
1	S. Nahmias, Production and Operations Analysis, 7th ed., Waveland Press, 2015.
2	Chopra and Meindl, Supply Chain Management, 6th ed., Pearson, 2016.
3	D.R. Kiran, Production Planning and Control: A Comprehensive Approach, 1st ed., Butterworth-Heinemann, 2019.