NANYANG TECHNOLOGICAL UNIVERSITY
NANYANG BUSINESS SCHOOL
BE1401/BE1402
BUSINESS OPERATIONS & PROCESSES

Academic Year	:	2023/2024	**Semester**	:	2
Course Coordinator	:	Assoc Prof Wang Qinan			
Pre-requisites	:	-			
No. of AUs	:	3			
Contact Hours	:	39 hours			

Course Aims

This course seeks to provide business and accountancy undergraduates with a rigorous appreciation of the issues and methodologies necessary for ensuring the competitiveness of the operations function in a firm. The course takes an analytics-based "process management' viewpoint while addressing a range of strategic and tactical issues. After completing this course, you will be able to understand the key tradeoffs required for designing, managing, and improving operations and processes in both manufacturing and service industries. This will give you a sound analytical background for further courses in Business Analytics Specialization, which in turn will prepare you for a future business career where you will be responsible for either managing operations or its interface with other business functions such as marketing, finance, accounting, human resources, and information technology.

Intended Learning Outcomes (ILO)
By the end of this course, you should be able to:

1. *Describe* fundamental issues in operations such as process analysis and improvement, project management, forecasting, quality management, inventory management and supply chain management (*ILO1*)

2. *Explain* the key tradeoffs necessary for designing, managing, and improving operations (*ILO2*)

3. *Compute* key performance measures related to the tradeoffs (*ILO3*)

4. Relate key performance measures with analysis and comparison of alternate systems *to strategic goals of companies* (*ILO4*)

Course Content

The course content will have as its backdrop the fundamental concepts and techniques necessary for designing, managing, and improving operations and processes in both manufacturing and service industries. The main topics covered include:

1. Introduction to Operations and the Strategic Importance of Operations
2. Introduction to Process Analysis – Little's Law and Applications

3. Capacity Management and Bottlenecks in Processes
4. Impact of Setups and Interruptions on Processes
5. Queues and Service Systems
6. Project Management
7. Applications of Linear Programming in Operations and LP Practicum
8. Forecasting
9. Quality Management
10. Inventory Management
11. Supply Chain Management

Assessment (includes both continuous and summative assessment)

Component	ILO Tested	NBS Learning Goal (Refer to Annex E for list)	Weighting	Team/Individual	Assessment Rubrics (Please insert rubrics as Appendix)
1. Final Examination	ILO1, ILO2, ILO4	Acquisition of knowledge	25%	Individual	N.A.
2. Quiz	ILO1, ILO2, ILO4	Acquisition of knowledge	30%	Individual	N.A.
3. Exercises/ Assignments	ILO1, ILO2, ILO3	Acquisition of knowledge	10%	Individual	N.A.
4. Group Project (written report and in- class presentation)	ILO3, ILO4	Problem Solving & Decision Making Oral communication Teamwork and Interpersonal Skills	20%	Group/Individual Every member is required to present	Problem Solving and Decision-Making Rubric Oral Communication Mandatory Peer Evaluation #
5. Class Participation	ILO1, ILO3	Oral Communication	15%	Individual	Oral Communication Rubric
Total			100%		

\# A mandatory peer evaluation will be done for the Group Project at the end of the course. The peer evaluation forms are given in the Appendix/Outline. The project work marks will be adjusted for unequal contributions among members.

Formative feedback

1. You will get feedback on quiz performance immediately on the conclusion of the quiz.

2. Feedback is central to the group project. You will be provided feedback on your project proposal to help you identify the strengths and weaknesses of your proposal. During the term, you will be provided verbal feedback on your analysis. Finally, you will be provided feedback on your project based on the rubric used for assessment.

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Seminars	Please watch the seminar recordings prior to the class. The seminar sessions will have considerable opportunities for interaction and discussion on the conceptual questions raised in the class. This will allow you to think critically and share your ideas with the class. Deep thinking, reviewing materials and clarifying your doubts/questions will provide you a sound platform to do well in the course assessments.
Exercises/ Assignments	You will be given exercises/assignments that will test how well you have absorbed the concepts after watching the seminar videos. These exercises will comprise short, simple questions (MCQ/True-False) and will have to be completed by the due date which will be prior to the class. You will be graded for these exercises.
In-Class activities	More detailed/complex exercises/case studies will be discussed in class and after allowing you some time for group discussion, I will call upon individuals to share their analysis. Practicing these exercises prior to the class will give you sound preparation for the course assessment. We will also discuss the real-life implications of this analysis. These exercises will not be graded.

The teaching approaches described above are strongly aligned to all learning outcomes
(please see ILO1, ILO2, ILO3 and ILO4 outlined above).

Reading and References

Most of the assigned reading materials and class notes will be provided online on NTULearn (http://ntulearn.ntu.edu.sg). The main textbook which will be used for the course is:

Required textbook/materials.

1. Operations Management, 2nd Edition by Gerard Cachon and Christian Terwiesch, 2020, McGraw-Hill, ISBN: 978-1-260-54761-0

2. Introduction to Management Science, 6th Edition by Frederick Hillier and Mark Hillier, 2019 (available as a digital version with the main text).

Other Reference Materials

1. The course will use components of *Technology Enabled Learning* from McGraw-Hill Connect's Learn Smart modules associated with the text Operations Management by Cachon and Terwiesch. This e-tool facilitates students' learning at their own pace, both prior to and after the seminar. Prior to the seminar, the students are introduced to the concepts covered in the seminar. After the seminar, the students assimilate concepts at a deeper level and sharpen their analytical toolkit by doing quantitative exercises.

2. Operations Management, 11th Edition, Lee J Krajewski, Manoj K Malhotra, Larry P Ritzman, 2016, Pearson.

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and take all scheduled assignments and tests by due dates. You are expected to take responsibility to follow up with course recordings and notes, assignments, and course related announcements for seminar sessions you have missed. You are expected to participate in all seminar discussions and activities.

(2) Absenteeism
Absence from class without a valid reason will affect your participation and overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. If you miss a seminar, you must inform the course instructor via email prior to the start of the class.

Academic Integrity

Good academic work depends on honesty and ethical behavior. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honor Code, a set of values shared by the whole university community. Truth, Trust, and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion, and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Course Instructor

Instructor	Office Location	Phone	Email
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Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	Course Introduction / Introduction to Operations and Process Analysis 1 (Little's Law and Applications)	ILO1, ILO2, ILO3	Chapters 1 & 2, CT; Lecture Notes
2	Process Analysis 2 (Capacity and Bottlenecks)	ILO2, ILO3, ILO4	Chapters 3, 4, CT; Lecture Notes

3	Process Analysis 3 (Set-up and Interruptions)	ILO2, ILO3, ILO4	Chapter 7, CT; Lecture Notes
4	Queues and Service Systems	ILO2, ILO3, ILO4	Chapter 16, CT; Lecture Notes
5	Project Management	ILO2, ILO3, ILO4	Chapter 7, KMR, Lecture Notes
6	Quiz #1/Applications of Linear Programming in Operations	ILO2, ILO3, ILO4	Chapters 2 HH; Lecture notes
7	LP Applications (contd.)/Linear Programming-Practicum	ILO2, ILO3, ILO4	Chapters 2, 3 HH; Lecture notes
8	Forecasting	ILO2, ILO3, ILO4	Chapter 15 (Optional 15.5); Lecture Notes
9	Introduction to Inventory Management	ILO2, ILO3, ILO4	Chapters 10, 12 CT; Lecture Notes
10	Quality Management (e-Learning)	ILO2, ILO3, ILO4	Lecture Notes, Readings
11	Quiz #2/ Inventory Management 2: Newsvendor Model	ILO2, ILO3, ILO4	Chapter 13 (Omit 13.5); Lecture Notes
12	Supply Chain Management	ILO2, ILO3, ILO4	Lecture Notes
13	Group Presentations	ILO1, ILO2, ILO3, ILO4	

CT: Operations Management, Cachon and Terwiesch
HH: Management Science, Hillier, and Hillier
KMR: Operations Management, Krajewski, Malhotra, and Ritzman

ASSESSMENT PLAN (As per AACSB Assurance of Learning (AOL) Requirement)

Assessment Rubric for Group Assignment

Traits	Performance Levels		
	Above Expectations (A+,A,A-)	**Met Expectations (B+, B, B-)**	**Below Expectation (C-F)**
Group Written Report – 50%			
Demonstrates logic (30%)	Presents and discusses solution(s) in coherent and logical way; flow is effective	Presents and discusses solutions(s) that are mostly correct and demonstrate logical thinking; may miss few steps, or omit a minor point in explanation of rationale for step taken in problem-solving	Steps taken in problem-solving lack logic, and unable to explain rationale for steps taken in problem-solving
Identifies alternative options. (30%)	Identifies a set of feasible options that demonstrates creativity and ability to integrate knowledge	Identifies and discusses a set of feasible alternatives	Does not identify alternatives or discuss
Selects an option that is consistent with the evaluation (30%)	Strong link between analysis and the option selected	Relatively adequate link between analysis and the option selected	No link or tenuous link between evaluation and option selected
Integrates the issues in the project to other business situations, stated or unstated. (10%)	Appreciates the possible interrelatedness between this situation and others, including those not stated in the scenario	Appreciates the possible interrelatedness between this situation and others stated in the scenario.	Does not seem able to appreciate how this situation might be related to others
Individual Oral Presentation – 50%			
Communication Outcome - has a clear message for the audience.	Central message is precisely stated; main points are clearly identified	While the central message is stated and the main points are identified, there is some ambiguity about its preciseness	Central message is not explicitly stated in the presentation. Main points are not clearly identified, audience unsure of the direction of the message.
Content – Presents relevant information.	Content is accurate, thorough, and directly on point; strong support and references are provided. Exhibits depth	While the content is accurate, there are some gaps in providing support and references. Exhibits some insights in	Content is erroneous or irrelevant; references and supporting materials are absent. Lack of depth in content

Supports main points with strong evidence.	and insight in content. Effective use of time and stays within time parameters.	content and there is reasonable use of time.	and little insights. Presentation falls outside set time parameters.
Structure - Organizes content coherently. Signals transitions between points	Organizational pattern is clearly and consistently observable and makes the content of the presentation cohesive.	Organizational pattern is somewhat clear with some gaps in consistency. The content of the presentation is largely cohesive.	Organizational pattern (specific introduction and conclusion, sequenced materials within the body, and transitions) is not observable.
Verbal - Speaks at appropriate speed and volume. Uses correct grammar and pronunciation.	Free of errors in grammar and pronunciation; good choices of word enhance clarity of expression. Vocal delivery is varied and dynamic. Speech rate, volume, and tone facilitate audience comprehension. Minimal gap fillers.	Largely free of errors in grammar and pronunciation with reasonable clarity of expression. Vocal delivery is okay and speech rate, volume, and tone facilitate audience comprehension.	Grammar, pronunciation, and word choice are deficient. Vocal delivery is too soft or too fast to understand; gap-fillers interfere with expression
Non-Verbal - Establishes eye contact. Uses gestures and movement to convey energy and confidence	Eye contact, posture, gestures, movement, and facial expressions make the presentation compelling, and speaker appears polished and confident.	Eye contact, posture, gestures, movement, and facial expressions make the presentation good; speaker appears reasonably confident.	Eye contact, posture, gestures, movement, and facial expressions are inappropriate and significantly distracting.

Class Participation

Class participation is assessed in every class. Points for class participation will be based on:

a) Regular and punctual attendance in class. Being an active listener in class.
b) The quality (rather than quantity) of comments offered during discussions as well as other discussions and in-class exercises,
c) The issues and comments that each student offers during a class, and sharing of specific experiences from industry that are related to concepts being taught in the class.

Assessment Rubric for Class Participation

Traits	Performance Levels		
	A+, A & A- (Above Expectations)	B +, B, B- (Met Expectations)	C -F (Below Expectations)
Engagement	Engages fully in class	Occasionally engages in distracting activities (e.g., using mobile phone, unnecessary chatting) in class.	Hardly focuses in class (e.g. using mobile phone, unnecessary chatting)
Contribution frequency	Speaks up/contributes in all classes	Occasionally speaks up/contributes in class	Does not speak up/contribute in class
Contribution quality	Contributions are constructive and insightful	Contributions demonstrate knowledge of subject matter	No contributions/ Contributions lack substance

CONFIDENTIAL PEER EVALUATION FORM FOR TEAM PROJECT

Member's name:

Seminar group and team number:

Please use the attached Peer Evaluation Rubric to evaluate yourself and your team members on each of the 5 stated attributes (on a scale of 1 to 7). State your ratings for yourself and each of your team members in the table below. For your self-assessment, insert "(Self)" after your name in the table below.

Index #	Name of team members	1 - RR	2 - CM	3 - CR	4 - CT	5 - RS	Average Rating
1							
2							
3							
4							
5							
6							

If any of your ratings above is **< 4**, please provide a brief explanation to justify the ratings.

Index #	Brief explanation to justify a rating of **< 4**

You may attach supporting documents (like emails and screen shots), if any, to support your explanations above.

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Teamwork & Interpersonal Skills (Peer Evaluation) Rubric
Learning Objective: The ability to work effectively with others in a group setting

Traits	Performance	
1. Roles and Responsibility (RR) Behaves professionally by upholding responsibility and assuming accountability for self and others in progressing towards the team's goal.	**Scant** Unclear about his/her own role; refuses to take a role in the group; insists to work individually and has limited coordination or communication with others.	**Substantially Developed** Always fulfills responsibilities; performs his/her role within the group with enthusiasm and demonstrates willingness to work collaboratively.
	Evaluation: Scant 1 2 3 4 5 6 7 Substantially Developed	
2. Communication (CM) Identifies appropriate mechanisms to coordinate and correspond with team members.	**Scant** Modes of communication are not appropriate, causing confusion and miscommunication among team members.	**Substantially Developed** Modes of communication are appropriate and maintaining timely communication and correspondence with team members.
	Evaluation: Scant 1 2 3 4 5 6 7 Substantially Developed	
3. Conflict Resolution (CR) Resolves conflicts using a variety of approaches.	**Scant** Does not recognize conflicts or is unwilling to resolve conflicts.	**Substantially Developed** Consistently resolves conflicts through facilitating open discussion and compromise.
	Evaluation: Scant 1 2 3 4 5 6 7 Substantially Developed	
4. Contributions (CT) Contributes positive input for the team; effectively utilizes one's knowledge and expertise.	**Scant** Largely disinterested in working in a group and refuses to participate; observes passively or is unwilling to share information with other team members.	**Substantially Developed** **Actively attends and participates in all activities and provides meaningful contribution in articulating ideas and opinions.**
	Evaluation: Scant 1 2 3 4 5 6 7 Substantially Developed	
5. Relationship (RS) Maintains cooperative interaction with other team members regardless of individual /cultural differences and respects diverse perspectives.	**Scant** Rarely listens to others and does not acknowledge the opinions that differ from his/her own.	**Substantially Developed** Engages in respectful relationships with all other members in the team. Embraces and accepts diverse points of view without prejudice.
	Evaluation: Scant 1 2 3 4 5 6 7 Substantially Developed	