

Course Description: Operations Management

1- Basic Information:

Course Name	Operations Management
Course ID	BQM501
Contact Hours (Registered Sessions)	24
Contact Hours (Synchronized Sessions)	24
Mid Term Exam	-
Exam	75 min
Registered Sessions Work Load	48
Synchronized Session Work Load	18
Credit Hours	5
Course Level	5

2- Pre-Requisites:

Course	ID
Fundamentals of Management	BMN401
Economic and Administrative Mathematics	GMA403

3- Course General Objectives:

Operations management refers to the process by which an organization converts inputs (e.g. labor, material, knowledge, equipment) into outputs (goods and services) for both its internal and external markets. In this course, students will understand the functions of operations management and apply techniques to ensure efficient and effective production of goods and services.

This course introduces methods and concepts used to support the production and operations management function. The major economic problems of production management discussed in this course, include: inventory model analysis, inventory control, production planning, production scheduling and control, forecasting, aggregate planning, project management, scheduling, MRP & JIT, and recent advances in operations planning and control. We shall focus on the decision problems that confront operations managers. We will discuss commonly occurring application problems such as the development of a manufacturing and service strategy, capacity planning, quality management, and location analysis. For all problems, solution techniques will be presented.

4- Intended Learning Outcomes (ILO):

The student should demonstrate the necessary capabilities to carry out the following activities:

Code	Intended Learning Outcomes
ILO1	The student learns and concludes the role of production and operations in business and in economics in general.
ILO2	The student learns about the problems and issues facing operations managers, and concludes the main strategic options that companies face when choosing and implementing operations.
ILO3	Students develop terminology, concepts, ideas, and tools to deal with production problems and issues in order to obtain a competitive advantage through operations.
ILO4	The students identify the inefficiency and ineffectiveness in production and operations process, and propose the adequate changes or major redesigns to improve the process.
ILO5	Students analyze processes using appropriate performance measures, such as flow time, productivity, and throughput in different situations in the process.
ILO6	The course builds a holistic foundation for students to understand decision-making that includes products and services, quality, processes, ability to choose the facility, and supply chain decisions that are essential to the success of the operations of any business organization.
ILO7	The student studies and discusses issues inherent in operations management, and understands manufacturing functions in the supply chain.
ILO8	The course introduces students to a variety of tools and techniques that assist process managers in exploring alternative decision-making methods.
ILO9	Students understand the specific methods of planning production operations, the importance of process control, planning and inventory management
ILO10	The course provides students with concepts of quality management practice and quality management tools in the organization through a wide range of analytical techniques used in production and operations management.
ILO11	The student applies the inventory and basic materials management methods applied in the processes including independent ordering methods (EOQ), dependent ordering methods (MPR), (MRP II), and (ERP);
ILO12	The student is acquainted with the agile production method, concepts, tools and techniques, including the concepts of JIT in Toyota production system.

5- Course Syllabus (24 hours of total Recorded Sessions, 24 hours of total synchronized sessions)

- **RS:** Recorded Sessions; **SS:** Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1 ILO2	<p><u>Unit1: Introduction to Production and Operations Management</u></p> <p>1.1.Historical development of Production and Operations Management (POM). 1.2.Meaning, definition and objectives, scope and significance 1.3.Operations functions and its environment- accounting, finance, marketing, R&D, etc. 1.4.Functions and Responsibilities of Operations Management 1.5.Life cycle approach to Operations Management 1.6.Operations Strategy 1.7.The problems of Production Management 1.8.Whither Operations Manager in Syria</p>	2	2	<input type="checkbox"/> Exercises <input type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	Read additional articles
ILO1 ILO2	<p><u>Unit 2: Productions Systems & Operations management functions and strategies</u></p> <p>2.1. The Role of Production Management 2.2. Role of Production System 2.3. Production/Operations Management a System View Point 2.4. Production System Design: 2.4.1. Intermittent 2.4.2. continuous 2.5. Productivity Improvement and Productive Use of Resources: concepts, factors affecting productivity; Productivity measurement, concept on Green Productivity 2.6. Upcoming Issues of Production Systems 2.7. Production Systems and Information Technology</p>	2	2	<input type="checkbox"/> Exercises <input type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	Read additional articles

	<p>2.8. Strategic operations management functions</p> <p>2.9. Tactical operations management functions</p> <p>2.10. Service and manufacturing organisations</p> <p>2.11. Formulating organisational strategy</p> <p>2.12. Operational strategies in manufacturing</p> <p>2.13. Operations strategies in service organisations</p> <p>2.14. The transformation model</p>			
ILO3 ILO4	<p><u>Unit 3: Designing Products, Services and Processes, and New Product Development</u></p> <p>3.1. Sources of New Product Ideas</p> <p>3.2. Product Development</p> <p>3.3. Role of Research and Development</p> <p>3.4. Evaluation of Product Design</p> <p>3.5. Design Specifications</p> <p>3.6. Product and Service design</p> <p>3.7. Design of Services and Service Process</p> <p>3.8. Manufacturing Process Technology</p> <p>3.9. Process Analysis Aids</p> <p>3.10. Assembly Drawing</p> <p>3.11. Assembly Chart</p> <p>3.12. Flow Process Chart</p> <p>3.13. Calculating product reliabilities,</p> <p>3.14. Determining value of backup systems</p>	2	2	<p><input type="checkbox"/> Exercises</p> <p><input type="checkbox"/> Assignments</p> <p><input checked="" type="checkbox"/> Seminars</p> <p><input checked="" type="checkbox"/> Projects</p> <p><input type="checkbox"/> Practices</p> <p><input type="checkbox"/> Others</p> <p>Read additional articles</p>
ILO6 ILO8	<p><u>Unit 4: Location decision</u></p> <p>4.1. Reasons and Importance of location decisions</p> <p>4.2. Factors affecting location decision of service, and manufacturing organizations</p> <p>4.3. Basic facilities layout concept</p> <p>4.4. Center of gravity method,</p> <p>4.5. Load-distance method</p>	2	2	<p><input checked="" type="checkbox"/> Exercises</p> <p><input type="checkbox"/> Assignments</p> <p><input checked="" type="checkbox"/> Seminars</p> <p><input checked="" type="checkbox"/> Projects</p> <p><input type="checkbox"/> Practices</p> <p><input checked="" type="checkbox"/> Others</p> <p>Read additional articles Solve additional exercises</p>

	<p>4.6. Waiting Line Theory (Single channel only)</p> <p>4.7. Product layout, process layout, cellular layout, fixed position layout</p> <p>4.8. Facility location</p> <p>4.9. Factors in facility location,</p> <p>4.10. Techniques of location analysis-BEP, Point Rating, central gravity, and Transportation methods</p>			
<p>ILO5</p> <p>ILO6</p>	<p><u>Unit 5: Capacity Planning and Facility Location</u></p> <p>5.1. Aspects of Capacity Planning</p> <p>5.2. Determination and measuring of Capacity Requirements</p> <p>5.2.1. Design capacity</p> <p>5.2.2. Effective capacity</p> <p>5.2.3. Actual output</p> <p>5.3. Evaluation of Alternative Plant Sizes</p> <p>5.4. Determination of Equipment Requirements</p> <p>5.5. What is Facility Planning?</p> <p>5.6. Need for Facility Planning</p> <p>5.7. Facility Planning-Objectives</p> <p>5.8. Types of Layouts</p> <p>5.9. Seven major layout strategies,</p> <p>5.10. Product versus Process Layout</p> <p>5.11. Developing the Process Layout</p> <p>5.12. Conventional Approach for Developing Process Layout</p> <p>5.13. Conventional Approach for Developing Product Layout</p> <p>5.14. Process flow structure</p> <p>5.15. Process Flow Technologies</p>	2	2	<p><input checked="" type="checkbox"/> Exercises</p> <p><input type="checkbox"/> Assignments</p> <p><input checked="" type="checkbox"/> Seminars</p> <p><input checked="" type="checkbox"/> Projects</p> <p><input type="checkbox"/> Practices</p> <p><input type="checkbox"/> Others</p> <p>Read additional articles</p> <p>Solve additional exercises</p>
<p>ILO6</p> <p>ILO8</p> <p>ILO9</p>	<p><u>Unit 6: Production Planning, Scheduling, Controlling</u></p> <p>6.1. Production Planning Concepts and control for Services</p> <p>6.2. Aggregate planning and Disaggregation planning</p> <p>6.3. Linking Long Term and Short Term Planning</p>	2	2	<p><input checked="" type="checkbox"/> Exercises</p> <p><input type="checkbox"/> Assignments</p> <p><input checked="" type="checkbox"/> Seminars</p> <p><input checked="" type="checkbox"/> Projects</p> <p><input type="checkbox"/> Practices</p> <p><input checked="" type="checkbox"/> Others</p> <p>Read additional articles</p> <p>Solve additional exercises</p>

	<p>6.4. The Purpose of Aggregate Plans 6.5. Steps in Aggregate Planning 6.6. Dimensions of Production Capacity 6.7. Managerial Importance of Aggregate Plans 6.8. Scheduling & Sequencing 6.9. Situation Requiring Scheduling 6.9.1. Classifying Production Systems 6.9.2. Scheduling Mass Production System 6.9.3. Scheduling Batch Production Systems 6.9.4. Scheduling Job Production Systems 6.9.5. General Principles and rules of Scheduling 6.10. Master Production Scheduling: Loading, Sequencing, Detailed Scheduling, Expediting, Input output control, Flow time and lateness calculations, 6.11. Moore's algorithm to minimize number of late jobs, 6.12. Johnson's rule for scheduling on two machines</p>				
<p>ILO7 ILO6</p>	<p><u>Unit 7: Optimizing operations using demand forecasting and capacity management</u> 7.1. Concept of forecast 7.2. Trends in customer demand 7.3. Demand forecasting variables 7.4. General Steps in the Forecasting Process 7.5. Importance and Applications of Forecasts in production/Operations Management. 7.6. Managing capacity by keeping production level 7.7. Managing capacity by chasing demand 7.8. Managing capacity by managing demand 7.9. Forecast demand and manage capacity 7.10. Demand forecasting models and methods</p>	<p>2</p>	<p>2</p>	<p><input checked="" type="checkbox"/> Exercises <input type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others</p>	<p>Read additional articles Solve additional exercises</p>

	<p>7.11. Qualitative Methods 7.11.1. Judgmental Forecasting 7.11.2. Opinion-Capture Techniques 7.11.3. Forecasting Based on Cross-Impact Analysis 7.12. Quantitative Methods Of Forecasting 7.12.1. Main Classes of Quantitative Models 7.12.2. Least Square Method 7.12.3. Time Series Analysis 7.12.4. Moving Average 7.12.5. Weighted Moving Average 7.12.6. Exponential Smoothing 7.12.7. Regression and Correlation 7.12.8. Coefficient of Determination 7.13. Application to Different Functional Areas 7.14. Selecting a Suitable Forecasting Method 7.15. Measures of Forecast Error 7.16. How computers assist in forecasting</p>				
<p>ILO5 ILO1 0 ILO1 2</p>	<p>Unit 8: Just-in-Time and Lean Systems 8.1. Characteristics of Just-In-Time System 8.2. Elements of Manufacturing, and The Just-In-Time Manufacturing Philosophy 8.3. Reconciling EOQ and JIT, 8.4. JIT Implementation in Industries 8.5. Supplier issues, 8.6. JIT Purchasing 8.7. JIT disadvantages 8.8. Using lean to improve flow and pull 8.9. Using lean to perfect organisational processes 8.10. The 5 step process for workplace organisation 8.11. • Hoshin Kanri and the PDCA cycle 8.12. Hoshin Kanri strategies and project stages 8.13. Using Jidoka to solve problems</p>	<p>2</p>	<p>2</p>	<p><input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices <input checked="" type="checkbox"/> Others</p>	<p>Read additional articles Solve additional exercises</p>

	<p>8.14. • Using standard work to optimize processes</p> <p>8.15. Lean strategies and tactics to eliminate waste,</p> <p>8.15.1. The Kanban System</p> <p>8.15.2. Kaizen system</p> <p>8.15.3. Flexible Manufacturing System</p> <p>8.16. Using lean to reduce waste and streamline value flow</p> <p>8.17. Value-add and none-value add activities</p>				
<p>ILO6 ILO8 ILO10</p>	<p>Unit 9: Quality, Planning and Control</p> <p>9.1. Concepts of quality: product quality and service quality</p> <p>9.2. Determinants and Benefits of good quality</p> <p>9.3. Responsibility for quality: management, design, procurement, operations, marketing, customers' service, packaging etc.</p> <p>9.4. Costs of quality</p> <p>9.5. Quality Control Methods: objectives, advantages</p> <p>9.6. Quality tools.</p> <p>9.6.1. Check sheet.</p> <p>9.6.2. Fishbone diagram.</p> <p>9.6.3. Histogram.</p> <p>9.6.4. Scatter plot.</p> <p>9.6.5. Pareto chart.</p> <p>9.6.6. Flowchart.</p> <p>9.6.7. Statistical process control (Control chart).</p> <p>9.7. Statistical process control -Control charts- control charts for variable and control charts for attributes</p> <p>9.8. Techniques of Quality Management</p>	2	2	<p><input checked="" type="checkbox"/> Exercises</p> <p><input checked="" type="checkbox"/> Assignments</p> <p><input checked="" type="checkbox"/> Seminars</p> <p><input checked="" type="checkbox"/> Projects</p> <p><input checked="" type="checkbox"/> Practices</p> <p><input checked="" type="checkbox"/> Others</p>	<p>Read additional articles</p> <p>Solve additional exercises</p>
<p>ILO9 ILO10 ILO11</p>	<p>Unit 10: Inventory and Materials Management</p> <p>10.1. Inventory concepts</p> <p>10.2. Inventory Costs</p> <p>10.3. Inventory Modeling</p> <p>10.4. Classical Inventory Model</p>	2	2		<p>Read additional articles</p> <p>Solve additional exercises</p>

	<p>10.5. Dependent and independent demand</p> <p>10.6. Inventory systems- continuous and periodical</p> <p>10.7. Basic EOQ Model (with and without discount)</p> <p>10.8. ABC classification Inventory Model</p> <p>10.9. Computation of inventory order quantities</p> <p>10.10. Reorder points and optimum number of orders</p> <p>10.11. Aggregate Planning</p> <p>10.12. Master bill of materials</p> <p>10.13. Planning for Materials Needs</p> <p>10.14. Material Requirement Planning just in Time System Scheduling</p>			<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices <input checked="" type="checkbox"/> Others	
ILO2 ILO8	<p><u>Unit 11: Maintenance and Professional Safety Management</u></p> <p>11.1. Basic Approaches to maintenance</p> <p>11.2. Factors determining the efficiency and effectiveness of maintenance</p> <p>11.3. Preventive and Remedial Maintenance</p> <p>11.4. Causes for component and equipment failure</p> <p>11.5. Means and objectives of measuring maintenance</p> <p>11.6. Computation of estimates of reliability</p> <p>11.7. Accident frequency rate, injury frequency rate, and average severity rate</p> <p>11.8. Major considerations in setting-up professional Safety program</p> <p>11.9. Professional Safety Engineering</p> <p>11.10. Objectives and process of professional Safety Inspection</p>	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices <input checked="" type="checkbox"/> Others	Read additional articles
ILO4 ILO1 1	<p><u>Unit 12: Advance Manufacturing System</u></p> <p>12.1. Manufacturing systems: Evolution & Competitiveness</p> <p>12.2. Classification of Process Technology</p>	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices	Read additional articles

12.3.	Computer Manufacturing (CIM)	Integrated	<input checked="" type="checkbox"/> Others
12.4.	Computer-Aided Design (CAD)		
12.5.	Group Technology (GT)		
12.6.	Computer-Aided Planning (CAPP)	Process	
12.7.	Robotics		
12.8.	Computer-Aided Planning (CAPP)	Process	
12.9.	Manufacturing Control System	Planning and	
12.10.	Just-In-Time System (JIT)	Manufacturing	
12.11.	Advanced MRP Type Systems		
12.12.	Optimized Technology (OPT)	Production	

6- Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration	Ex	Exams	Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments	PW	Practice Work		

ILO Code	ILO	Intended Results	Assessment Type				
			ISC	PW	Ex	PF2F	Rpt
ILO1	The student learns and concludes the role of production and operations in business and in economics in general.	Ability to clarify concepts related to production and process management.	✓				✓
ILO2	The student learns about the problems and issues facing operations managers, and concludes the main strategic options that companies face when choosing and implementing operations.	Enables the student to recognize the problems of operations and the ability to deal with them	✓			✓	✓
ILO3	Students develop terminology, concepts, ideas, and tools to deal with production problems and issues in order to obtain a	The ability to model production problems and the	✓	✓	✓		✓



	competitive advantage through operations.	ability to solve them					
ILO4	The students identify the inefficiency and ineffectiveness in production and operations process, and propose the adequate changes or major redesigns to improve the process.	The ability to use appropriate performance measures	✓	✓	✓	✓	✓
ILO5	Students analyze processes using appropriate performance measures, such as flow time, productivity, and throughput in different situations in the process.	Ability to suggest changes and redesign to improve the process.	✓	✓	✓	✓	✓
ILO6	The course builds a holistic foundation for students to understand decision-making that includes products and services, quality, processes, ability to choose the facility, and supply chain decisions that are essential to the success of the operations of any business organization.	Enables the student to link the concept of quality to production and processes	✓	✓	✓	✓	✓
ILO7	The student studies and discusses issues inherent in operations management, and understands manufacturing functions in the supply chain.	The ability of the student to distinguish the function of production and processes within the supply chain	✓	✓	✓	✓	✓
ILO8	The course introduces students to a variety of tools and techniques that assist process managers in exploring alternative decision-making methods.	Enables the student to use quantitative techniques to solve production problems	✓	✓	✓	✓	✓
ILO9	Students understand the specific methods of planning production operations, the importance of process control, planning and inventory management	The student's ability to develop a productive plan and schedule it through a project or job	✓			✓	✓
ILO10	The course provides students with concepts of quality management practice and quality management	Enables the student to apply quality management tools	✓			✓	✓

	tools in the organization through a wide range of analytical techniques used in production and operations management.	to practical cases of local and international companies					
	The student applies the inventory and basic materials management methods applied in the processes including independent ordering methods (EOQ), dependent ordering methods (MPR), (MRP II), and (ERP);	Enables the student to employ inventory management techniques to serve production processes.	✓			✓	✓
	The student is acquainted with the agile production method, concepts, tools and techniques, including the concepts of JIT in Toyota production system.	Ability to employ JIT and Agile Production in a case study of Syrian reality	✓			✓	✓

7- Practice Tools:

Tool Name	Description
ERP	Enterprise Resource Planning (ERP) Enterprise Resource Planning (ERP) is made of many business management software that share a common database making it easier to streamline workflows throughout the company.

8- Main References

- 1- Walley, P. (2017) 'Introduction to operations management', in The Open University (2017) B207 Readings Block 1: Big ideas in Organisations, Milton Keynes, The Open University.
- 2- Jay Heizer & Barry Render (2016). Operations Management_ Sustainability and Supply Chain Management (12th Edition).
- 3- W. J., & Sum, C. C. (2015). Operations management. Stevenson, New York: McGraw-Hill Education.

9- Additional References

- 1- Heizer, J., Render, B. (2014). Operations Management, Global Edition, 11/E, Prentice Hall.
- 2- Brandon-Jones, A., Slack, N., & Johnson, R. (2013). Operations Management. (7th ed.) Harlow, England: Prentice Hall,
- 3- Pearson.Chase. R.B., F.B. Jacob, and N.J. Aquilano. Operations Management for a Competitive Advantage, Eleventh Edition. New York: Irwin McGraw-Hill, 2006.
- 4- Crandall, R. E. (2014) Principles of Supply Chain Management, 2nd edn, CRC Press.
- 5- Hayes, R. H. and Wheelwright, S. C. (1984) Restoring Our Competitive Edge, New York, John Wiley.
- 6- Slack, N., Chambers, S. and Johnston, R. (2007) Operations Management, 5th edn, Harlow, Pearson Education Limited.
- 7- محمد توفيق ماضي (2011)، كتاب إدارة الإنتاج والعمليات محل اتخاذ القرارات، الدار الجامعية الإسكندرية.
- 8- سليمان خالد عبيدات (2010)، مقدمة في إدارة الإنتاج والعمليات، الجامعة الأردنية، دار المسيرة للنشر والتوزيع والطباعة،
- 9- العلي. عبد الستار (2006)، إدارة الإنتاج والعمليات، دار وائل للنشر، عمان، الأردن.
- 10- محسن عبد الكريم (2005)، إدارة الإنتاج والعمليات، دار الذاكرة للنشر والتوزيع عمان – الأردن.