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| **AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH**  Faculty of Business Administration  Department of Operation Management  **Program**: Engineering | |
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| Course Code | MGT 3202 |
| Name of Course/Title | Engineering Management |
| **Course Type** | Engineering Core Course |
| **Level** | 3 |
| **Academic Session** | Fall 2024-2025 |
| **Name (s) of Academic staff / Instructor(s)** | Dr. Mossa. Anisa Khatun  Faculty, Department of Operations and Supply Chain Management  AIUB, Room No: 42B04 Email: anisa@aiub.edu |
| **Consultation Hours:** | Sunday: 10:00 am- 12:30 pm & 3:30 to 4:00 pm  Monday: 12:30 pm- 2:00 pm & 3:30 to 4:00 pm  Tuesday: 10:00 am- 12:30 pm & 3:30 to 4:00 pm  Wednesday: 12:30 am- 2:00 pm & 3:00 to 4:00 pm  Thursday: 10:00 am-12:30 pm & 2:00 pm to 4:00 pm |
| **Rationale for the inclusion of the course / module in the programme** | The course introduces the student to the various aspects of dealing with a project as the study of project management is significant because of its importance in corporate world and every sector of businesses. This course lets the students analyze various practical case studies covering topics of operations, supply chain, project and quality management. It also develops students’ skills to solve management related problems in such areas as productivity, forecasting, inventory management, transportation model, location planning, capacity planning and decision models. Specifically, it will inculcate in the students the essential learning domains and competencies with the help of the following contents: |
| **Pre-requisite (if any)** | Engineering Ethics |
| **Status** | Core Course |
| **Credit Value** *(hours)* | 3 |
| **Total Marks** | 100 |

**Course Summary:** This course provides an opportunity to study and practice the forms of management that students will need for a successful professional career and to receive the fundamental concept of engineering management. Therefore, this course prepares the students in three categorical areas: (a) fundamental knowledge of engineering management, (b) psychomotor skills for application of that knowledge and (c) affective skills for developing appropriate management strategies. The course therefore meets the students’ needs for all types of conceptual, analytical and organization skills for current professional domains. This course lets the students analyze various practical case studies covering topics of operations, supply chain, project and quality management. It also develops students’ skills to solve management related problems in such areas as productivity, forecasting, inventory management, transportation model, location planning, capacity planning and decision models. Classroom tasks and assignments are completed both individually and in groups. At the end of the course, students also develop project management competencies, using software, to deal with diverse academic and industry needs.

**Course Objective:**

**Course Leaning Outcome (CLO): at the end of the Course, the Student will be able to-**

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| **CLO1** | Relate the fundamental concept of engineering management in local and global context. |
| **CLO2** | Explain how companies can achieve competitive advantages through value-added planning and strategy |
| **CLO3** | Analyze various practical issues covering topics of operations, supply chain, project and quality management. |
| **CLO4** | Apply their skills to solve management related problems in areas such as productivity, forecasting, inventory management, transportation model, location planning, capacity planning and decision models |
| **CLO5** | Develop project management competencies, using software, to deal with diverse academic and industry needs. |
| **CLO6** | Appreciate the fundamental concept of engineering management in global environment and its application to  academic and industry needs |

**Mapping of Course Outcomes to Program Outcomes:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 | PLO9 | PLO 10 |
| CLO1 |  |  |  |  |  |  |  |  |  |  |
| CLO2 |  |  |  |  |  |  |  |  |  |  |
| CLO3 |  |  |  |  |  |  |  |  |  |  |
| CLO 4 |  |  |  |  |  |  |  |  |  |  |
| CLO 5 |  |  |  |  |  |  |  |  |  |  |
| CLO 6 |  |  |  |  |  |  |  |  |  |  |

**Mapping of Course Outcomes (PO/CLO) to Level of Domain**

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| **CO/CLOs** | **Level of Domain** | | | | | **PO Assessed** | **Assessment Tools** |
| **C** | **P** | **A** | **S** | **AO** |
| **CO1** | √ |  |  |  |  | 3 | Survey, Poster Presentation etc. |
| **CO2** | √ |  |  |  |  | 4 | Group discussion, Study Tour etc. |
| **CO3** |  | √ |  |  |  | 5 | Quiz, Mid, Final exam, Case study etc. |
| **CO4** |  | √ |  |  |  | 6 | Quiz, Mid, Final exam, Case study, etc. |
| **CO5** |  |  | |  |  | | --- | --- | |  | √ | | |  | 5 | Assignment, Term Paper, Presentation etc. |
| **CO6** |  |  | |  |  | | --- | --- | |  | √ | | |  | 4 | Study tour, Poster presentation etc. |
| C: Cognitive; P: Psychomotor ; A: Affective ; S: Soft-skills (CT: Critical Thinking, TS: Teamwork, Leadership etc.); Any other: AO | | | | | | | |

**Topics to be covered/Content of the course**

| **Topics** | **Specific objective(s)** | **Suggested Activities** | **Time Frame** | **Teaching Strategy(s)** | **CLO Mapped** |
| --- | --- | --- | --- | --- | --- |
| **a. AIUB Vision & Mission**  **b. Introduction to Management:**   * Course Introduction * Engineering Management | * To understand the AIUB Vision & Mission * To develop an overall idea of fundamental of management and to generate knowledge on Engineering Management. * Case Study 1: Why Manufacturing Matters | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Board work | Week  1 | * Lecture session * Presentation * Interactive discussion | CLO 1, 2  and 6 |
| **c. Productivity:**   * Introduction to productivity * Productivity measures * Productivity growth | * Understand the application of forecasting in engineering environment * Define the term related to topics of productivity * Productivity exercise | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Board work | Week  2 | * Lecture session * Interactive discussion * Class works * Problem solving * Quiz | CLO 4 |
| **d. Forecasting**   * Fundamentals of forecasting * Forecasting Models: *(Moving Average, Weighted Moving Average, Exponential Smoothing)* * Forecasting Accuracy:   *(MAD, MSE, MAPE)* | * Understand the application of forecasting in management * Define the term related to topics of forecasting * Solve problems using forecasting models * Recommend decision based on forecast accuracy * Case Study 2: Blue water Bridge forecasting | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Case study analysis * Group seat work * Board work | Week  3-4 | * Lecture session * Presentation * Interactive discussion * Class works * Problem solving * Case studies * Group work * Quiz | CLO 4 |
| **e. Decision Making Tools**   * Decision Tree Model * Formulation of decision problem * Graphical presentation * Linear Programming (LP) | * Understand the application of decision-making tools in management * Define the term related to topics of decision making * Solve problems using decision tree model, such as graphical presentation * Decision Tools Exercises | * Interactive lecture discussion * Class Note Taking * Student Reporting * Problem Solving * Group Seat Work | Week  5-6 | * Lecture session * Presentation * Interactive discussion * Class works * Problem solving * Group work | CLO 4 |
| **f. Inventory Management**   * Fundamentals of inventory management * Inventory models *(ABC, EOQ, ROP)* * Case study | * Understand the application of inventory in business * Define the term related to topics of inventory management * Solve problems using initial solution models   Case Study-3: ABC Classification and EOQ | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Case study analysis * Group seat work   Board work | Week  7 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Case studies * Group work * Quiz | CLO 4 |
| **Mid Term Exam.** |  |  | Week  8 |  |  |
| **g. Capacity Planning**   * Fundamentals of capacity planning * BEP analysis * Problem solving | * Understand the application of capacity planning in management * Define the term related to topics of capacity * Solve problems using BEP | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Board work | Week  9 | * Lecture session * Interactive discussion * Class works * Assignments * Problem solving | CLO 4 |
| **h. Supply Chain Management**   * Fundamentals of supply chain * Drivers of SCM | * Understand the application of supply chain management in an organization * Define the term related to topics of SCM | * Interactive lecture discussion * Class note taking * Student reporting * Video clip analysis | Week  10 | * Lecture session * Presentation * Interactive discussion * Class works * Quiz | CLO 3 |
| **j. Transportation Model**   * Transportation problem: scenario, requirements, assumptions, formulation of LP problem and network presentation * Transportation Models *(North west , Least cost)* | * Understand the transportation problem in business * Define the term related to topics of transportation modeling * Solve problems using initial solution models | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Board work | Week  11 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Quiz | CLO 4 |
| **k. Quality Management**   * Basics of Quality * Quality Control Tools *(Histogram, Control Chart, Pareto and check Sheet)* | * Understand the application of quality in business * Define the term related to topics of quality management * Solve problems using quality control tools * Case Study 4: Control Chart | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Case study analysis * Group seat work * Board work | Week  12-13 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Case studies * Group work | CLO 3 |
| **l. Project Management**   * Fundamentals of project management * Project Management Tools: *(WBS, PERT/CPM, Gantt chart)* * Case study | * Understand the application of project management * Define the term related to topics of project * Solve problems using project management tools * Case Study 5: Preparing WBS | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Case study analysis * Group seat work * Board work * Project Work * Project Reporting | Week  13-14 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Case studies * Group project work | CLO 3 |
| **m. Project Cost Management**   * Fundamentals of Project Cost Management * Cost Monitoring: *(Planned value, earned value, actual cost)* * Case study | * Understand the application of cost management in project * Define the term related to topics of project cost management * Solve problems using cost analysis * Case Study 6: Cost estimating and budgeting for a construction project | * Interactive lecture discussion * Class note taking * Student reporting * Problem solving * Case study analysis * Group seat work * Board work * Project Work * Project Reporting | Week  15 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Case studies * Group project work | CLO 3 |
| **n. Project Software Presentation**   * MSP interface * Project management tools: *(WBS, Gantt Chart / CPM / Slack time, Assign the resources, Total project cost)* | * Understand the application of project management software * Case Study 7: Project work | * Interactive lecture discussion * Class note taking * Student reporting * Case study analysis * Group seat work * Computer lab work * Project Work * Project Reporting | Week  16 | * Lecture session * Presentation * Interactive discussion * Class works * Assignments * Problem solving * Case studies * Group project work | CLO 5 |
| **Final Exam.** |  |  | Week 17 |  |  |

**ASSESSMENT PATTERN**

**Quizzes:** A total of two quizzes will be taken before the midterm and similarly two quizzes will be taken during the final term. Best one quiz from each term will be considered when tabulating grade or total marks for the course

**Assignment:** Students will be asked to work in groups consisting of maximum of five members and submit one assignment and case study before the midterm exam and another before the final term exam. Each assignment module will consist of several small tasks which will be provided to the students after the conclusion of topics pertaining to the assignment topics.

**Exam:** Theory exams with a special emphasis on testing quantitative and conceptual skills of the students. At least 60% of the questions will be quantitative in nature and the rest will test the conceptual knowledge of the students

**Classroom Participation:** Students will get full marks in attendance and class participation provided they do not miss more than 2 lectures before the midterm and 2 lectures before the final term. Extra incentive will be provided to students who have attended all the lecturers

**CIE- Continuous Internal Evaluation-Midterm (Marks)**

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| **Bloom’s Taxonomy Domain:** | | **Case Study** | **/Assignments** | **Quizzes** | **Presentation** |
| **Cognitive Domain** | **C1** Remembering |  | 3 | **3** |  |
| **C2** Understanding |  | 2 | **3** |  |
| **C3** Applying |  | 2 | **3** |  |
| **C4** Analyzing |  | 3 | **3** |  |
| **C5** Evaluating |  | 3 | **3** |  |
| **C6** Creating |  |  |  |  |
| **Affective Domain** | **A1** Receive |  |  |  |  |
| **A2** Respond |  | 2 |  |  |
| **A3** Value |  |  |  |  |
| **A4** Organize |  |  |  |  |
| **A5** Internalize |  |  |  |  |
| **Psychomotor Domain** | **P1** Perception |  |  |  |  |
| **P2** Set |  |  |  |  |
| **P3** Guided Response |  | 2 | **3** |  |
| **P4** Mechanism |  | 3 | **2** |  |
| **P5** Complex Overt Response |  |  |  |  |
| **P6** Adaption |  | 2 |  |  |
| **P7** Origination |  |  |  |  |

**SME- Semester Mid Examination (Marks)**

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| **Bloom’s Category**  **(Marks)** | **Test** |
| Remember | 5 |
| Understand | 10 |
| Apply | 10 |
| Analyze | 15 |
| Evaluate | 10 |
| Create |  |

**CIE- Continuous Internal Evaluation-Final Term (Marks)**

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| --- | --- | --- | --- | --- | --- | --- |
| **Bloom’s Taxonomy Domain:** | | **Case Study** | **Assignments** | **Quizzes** | **Presentation** | **Final Paper** |
| **Cognitive Domain** | **C1** Remembering |  | 3 | **3** |  |  |
| **C2** Understanding |  | 2 | **3** |  |  |
| **C3** Applying |  | 2 | **3** |  |  |
| **C4** Analyzing |  | 3 | **3** |  |  |
| **C5** Evaluating |  | 3 | **3** |  |  |
| **C6** Creating |  |  |  |  |  |
| **Affective Domain** | **A1** Receive |  |  |  |  |  |
| **A2** Respond |  | 2 |  |  |  |
| **A3** Value |  |  |  |  |  |
| **A4** Organize |  |  |  |  |  |
| **A5** Internalize |  |  |  |  |  |
| **Psychomotor Domain** | **P1** Perception |  |  |  |  |  |
| **P2** Set |  |  |  |  |  |
| **P3** Guided Response |  | 2 | **3** |  |  |
| **P4** Mechanism |  | 3 | **2** |  |  |
| **P5** Complex Overt Response |  |  |  |  |  |
| **P6** Adaption |  |  |  |  |  |
| **P7** Origination |  |  |  |  |  |

**SFE- Semester Final Examination (Marks)**

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| --- | --- |
| **Bloom’s Category**  **(Marks)** | **Test** |
| Remember | 5 |
| Understand | 10 |
| Apply | 10 |
| Analyze | 15 |
| Evaluate | 10 |
| Create |  |

**Evaluation:**

The final grade for this class will be based on the points achieved on the following areas:

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| **Mid Semester Assessment** | **Proportion** | **Final Semester Assessment** | **Proportion** |
| Quiz | 20% | Quiz | 20% |
| Attendance and Class Performance | 15% | Attendance and Class Performance | 10% |
| Assignment (individual) |  | Project Presentation | 5% |
| Assignment /Case study(Group) | 15% | Assignment/ Case study (Group) | 15% |
| **Midterm Examination** | **50%** | **Final Examination** | **50%** |
| Total | **100%** | Total | **100%** |
| To be converted into  for contribution to Final grade. | **40%** | To be converted into  for contribution to Final grade. | **60%** |

**Textbooks and other resources**

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| **Required Textbooks:**   1. **Stevenson, William J., Operations Management, 12th edition, McGraw-Hill.** | **Reference Book:**  **1. A Guide To The Project Management Body of Knowledge, (PMBOK® Guide), 5 th Ed., Project Management Institute, Inc.**  **2. Kast & Rosenzweig, Organization & Management, 6th edition**  **3. Adam & Ebert, Production and Operations Management, 6th edition, Prentice Hall**  **4.William J. Stevenson, Production Operations Management. McGraw-Hill Irwin**  **5. Lee J. Krajewski, Operations Management Processes & Value, Pearson Education**  **6. Roberta S. Russell, Bernard W. Taylor III, Operations Management, Pearson Education.**  **7.Steve Brown, Operations Management: Policy, Practice and Performance Improvement** |

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**Other Resources:**