Republic of Iraq

Ministry of Higher Education & Scientific Research Supervision and

Scientific Evaluation Directorate Quality Assurance and Academic Accreditation

International Accreditation Dept.

Academic Program Specification Form For The

Academic

University of Baghdad

College of Engineering

Number Of Departments In The College: 13

Date of Form Completion: 1/10/2020

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| Head ’s Department Name  Prof. Dr. Fathi Abdulsahib Alshmaa  Date : 1/10/2020  Signature | Dean’s Assit. For Scientific Affairs  Prof. Dr. Wadood Taher  Date : 1/10/2020  Signature |

Quality Assurance and

University Performance Manager

Asst. Prof. Dr. Meervat Altaie

Date: 2/ 2/ 2020

Signature

Dean Approval

**TEMPLATE FOR PROGRAMME SPECIFICATION**

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**PROGRAMME SPECIFICATION**

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

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| 1. Teaching Institution | University of Baghdad |
| 2. University Department/Centre | College of Engineering |
| 3. Programme Title | Mechanical Engineering Department (MED) |
| 4. Title of Final Award | B.Sc. of Science in Mechanical Engineering |
| 5. Modes of Attendance offered | Annual |
| 6. Accreditation | ABET |
| 7. Other external influences | / |
| 8. Date of production/revision of  this specification | 2/2/2020 |
| 9. Aims of the Program | |
| * The ability to improve operations by solving complex engineering problems. And the concepts and principles of Quality, Total Quality Management (TQM), ISO and Reliability. | |
| * Demonstrate professional leadership. | |
| * Motivation and the ability to achieve lifelong learning career. | |
| * Performance of tasks advanced in the industry, and the ability to successfully planning, control, and implementation of large-scale projects. | |
| * Understand and apply the principles of science, technology, engineering and mathematics, which include industry-related problems. | |
| * Contribute to the profitable growth of the industrial sectors using analytical tools, effective computational approach, methodology and systems thinking. | |
| * Maintaining high standards of professional and ethical responsibility. | |
| * Work effectively, diverse and multicultural emphasis on the application of skills, teamwork and communication. | |
| * Practice and lifelong learning to maintain the technical operation and excellence in various fields. | |
| * Promotion of the profession and its benefits to the community | |
| * The ability to improve operations by solving complex engineering problems. And the concepts and principles of Quality, Total Quality Management (TQM), ISO and Reliability. | |
| * Demonstrate professional leadership. | |

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| 10. Learning Outcomes, Teaching, Learning and Assessment Methods |
| A. Cognitive goals  A1. An ability to apply knowledge of mathematics, science, and engineering  A2. An ability to design and conduct experiments, as well as to analyze and interpret data.  A3. An ability to design a system, component, or process to meet desired needs. |
| B. The skills goals special to the program.  B1. An ability to function on multidisciplinary teams.  B2. An ability to identify, formulates, and solves engineering problems.  B3. An ability to understand professional and ethical responsibility.  B4. An ability to communicate effectively.  B5. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental |
| Teaching and Learning Methods |
| * Lectures. * Tutorials. * Homework and Assignments. * Tests and Exams. * In-Class Questions and Discussions. * Connection between Theory and Application. * Field Trips. * Extracurricular Activities. * Seminars. * In- and Out-Class oral conservations. * Reports, Presentations, and Posters |
| Assessment methods |
| 1. Examinations, Tests, and Quizzes.  2. Extracurricular Activities.  3. Student Engagement during Lectures.   1. Responses Obtained from Students, Questionnaire about Curriculum and Faculty Member (Instructor). |
| C- Affective and value goals  C1-- Enabling the student to acquire the skill of thinking in dealing with various engineering problems  C2-- Enabling the student to acquire the skill of thinking in analysis  C3--Enabling the student to acquire the skill of design thinking  C4-- Enabling the student to acquire the skill of thinking in analyzing the results of the tests for mechanical work |
| Teaching and Learning Methods |
| 1. The use of modern technologies in giving the scientific lecture in the classroom  2. Solving exercises through the participation of all students in performing the exercise solving stages  3. Conducting seminars to review and solve site problems for engineering projects |
| Assessment methods |
| 1. Granting a degree on the student’s participation in solving the exercise 2. Granting a degree on the student’s contribution to the seminar 3. Granting a grade for homework that needs time for reflection and analysis |

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| D. General and Transferable Skills (other skills relevant to employability and  personal development)  D1 - developing students' abilities to acquire the required skills in mechanical  engineering  D2 - Developing and refining the professional personality required of the  student required in different work places  D3- Enabling the student to obtain higher academic degrees through acquiring  the basic information required in the major |
| Teaching and Learning Methods |
| 1. Implementing a training program for a specific period in various work sites  2. Holding specialized seminars and conferences in the department in cooperation with experts from the college and outside it |
| Assessment Methods |
| 1. Conducting site visits to various work sites to assess the student’s skills at the site through preparing reports for these visits  2. Holding special seminars for project managers, resident engineers and students to discuss engineering problems, methods of treatment, and how to manage engineering projects. |

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| 11. Programme Structure | | | | | |
| Level/Year | Course or  Module  Code | Course or Module  Title | Credit rating | Awards and Credits | |
| Theo. | Exp. |
| MEC 101 | Mathematics / I | 6 | 3 | / |
| MEC 102 | Static & Dynamic | 8 | 4 | / |
| MEC 103 | Engineering Drawing and Descriptive Geometry | 7 | 2 | 3 |
| MEC 104 | Production Engineering | 6 | 2 | 2 |
| MEC 105 | Electrical Eng. / I | 5 | 2 | 1 |
| MEC 106 | Programming / I | 5 | 2 | 1 |
| MEC 107 | Human Rights | 2 | 1 | / |
| MEC 108 | Arabic | 2 | 1 | / |
| MEC 109 | English/ I | 2 | 1 | / |
| Second Year | ME201 | Mathematics / II | 6 | 3 | / |
| ME202 | Fluid Mechanics / I | 6 | 3 | / |
| ME203 | Thermodynamics | 4 | 2 | / |
| ME204 | Mechanics of Materials and Machines | 6 | 3 | / |
| ME205 | Eng. of Metallurgy | 4 | 2 | / |
| ME206 | Mechanical Drawing | 4 | 1 | 2 |
| ME207 | Programming / II | 8 | 3 | 2 |
| ME208 | Mechanical Eng. Laboratories / II | 3 | / | 3 |
| Third Year | ME301 | Eng. and Numerical Analysis | 7 | 3 | 1 |
| ME302 | Fluid Mechanics / II | 6 | 3 | / |
| ME303 | Heat Transfer | 4 | 2 | / |
| ME304 | Strength of Materials | 4 | 2 | / |
| ME305 | Mechanics of Machines and Vibrations | 4 | 2 | / |
| ME306 | Principles of Manufacturing Processes | 7 | 3 | 1 |
| ME307 | Electrical Engineering / II | 5 | 2 | 1 |
| ME308 | Mechanical Eng. Laboratories / III | 3 | 3 | 3 |
| Forth Year | ME401 | Design of Machine Elements | 9 | 4 | 1 |
| ME402 | Control and Measurements | 4 | 2 | / |
| ME403 | Air-Conditioning and Refrigeration | 6 | 3 | / |
| ME404 | Power Eng. | 6 | 3 | / |
| ME405 | Industrial Eng. | 4 | 2 | / |
| ME406 | Engineering Materials | 4 | 2 | / |
| ME407 | Engineering Project | 5 | 1 | 3 |
| ME408 | Mechanical Eng. Laboratories / IV | 3 | / | 3 |

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| 12. Personal Development Planning |
| Developing students' skills in student planning and asking them for reports and seminars throughout the stages and various topics to develop personal skills |
| 13. Admission criteria. |
| Central acceptance from the Ministry of Higher Education and Higher Education. |
| 14. Key sources of information about the programme |
| * Department email [mech-engr@baghdad-eng.org](mailto:mech-engr@baghdad-eng.org) * Department page on the College of Engineering website * Mechanical Engineering Department Guide * Reviewed of Self-Assessment Report |

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| **Curriculum Skills Map** | | | | | | | | | | | | | | | | | | | | | | | |
| **please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed** | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | **Programme Learning Outcomes** | | | | | | | | | | | | | | | | | | | |
| Year / Level | Course  Code | Course  Title | Core (C) Title or Option (O**)** | Knowledge and Understanding | | | | Subject- Specific Skills | | | | | Thinking Skills | | | | | | General and Transferable Skills (or) Other skills relevant to employability and personal development | | | | |
| **A1** | **A2** | **A3** | **A4** | | **B1** | **B2** | **B3** | **B4** | | **B5** | **C1** | **C2** | **C3** | **C4** | | **D1** | **D2** | **D3** | **D4** |
| **First year** | MEC 101 | Mathematics / I | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 102 | Static & Dynamic | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 103 | Engineering Drawing and Descriptive Geometry | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 104 | Production Engineering | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 105 | Electrical Eng. / I | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 106 | Programming / I | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 107 | Human Rights | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 108 | Arabic | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| MEC 109 | English/ I | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| **Second year** | ME201 | Mathematics / II | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME202 | Fluid Mechanics / I | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME203 | Thermodynamics | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME204 | Mechanics of Materials and Machines | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME205 | Eng. of Metallurgy | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME206 | Mechanical Drawing | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME207 | Programming / II | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME208 | Mechanical Eng. Laboratories / II | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| **Third year** | ME301 | Eng. and Numerical Analysis | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME302 | Fluid Mechanics / II | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME303 | Heat Transfer | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME304 | Strength of Materials | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME305 | Mechanics of Machines and Vibrations | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME306 | Principles of Manufacturing Processes | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME307 | Electrical Engineering / II | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME308 | Mechanical Eng. Laboratories / III | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| **Fourth year** | ME401 | Design of Machine Elements | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME402 | Control and Measurements | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME403 | Air-Conditioning and Refrigeration | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME404 | Power Eng. | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME405 | Industrial Eng. | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME406 | Engineering Materials | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME407 | Engineering Project | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |
| ME408 | Mechanical Eng. Laboratories / IV | **C** |  |  |  |  | |  |  |  |  | |  |  |  |  |  | |  |  |  |  |

**TEMPLATE FOR COURSE SPECIFICATION**

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**COURSE SPECIFICATION**

This Course Specification provides a concise summary of the main features of the

course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with program specification.

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| 1. Teaching Institution | University of Baghdad |
| 2. University Department/Centre | College of Engineering |
| 3. Course title/code | Mechanical Engineering Department  (MED) |
| 4. Modes of Attendance offered | Industrial Engineering – ME405 |
| 5. Semester/Year | Year |
| 6. Number of hours tuition (total) | 2 hr./ week × 30 Weeks (60 hrs.) |
| 7. Date of production/revision of this  specification | 2/2/2020 |
| 8. Aims of the Course | |
| The ability to improve operations by solving complex engineering problems. And the concepts and principles of Quality, Total Quality Management (TQM), ISO and Reliability. | |
| Demonstrate professional leadership. | |
| Motivation and the ability to achieve lifelong learning career. | |
| Performance of tasks advanced in the industry, and the ability to successfully planning, control, and implementation of large-scale projects. | |
| Understand and apply the principles of science, technology, engineering and mathematics, which include industry-related problems. | |
| Contribute to the profitable growth of the industrial sectors using analytical tools, effective computational approach, methodology and systems thinking. | |
| Maintaining high standards of professional and ethical responsibility. | |
| Work effectively, diverse and multicultural emphasis on the application of skills, teamwork and communication. | |

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| 1. Cognitive goals.   A1. An ability to apply knowledge of mathematics, science, and engineering  A2. An ability to design and conduct experiments, as well as to analyze and interpret data.  A3. An ability to design a system, component, or process to meet desired needs. |
| B. The skills goals special to the course.  B1. An ability to function on multidisciplinary teams.  B2. An ability to identify, formulates, and solves engineering problems.  B3. An ability to understand professional and ethical responsibility.  B4. An ability to communicate effectively.  B5. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental |
| Teaching and Learning Methods |
| Lectures, Tutorials, Homework and Assignments, Tests and Exams, In-Class Questions and Discussions, Connection between Theory and Application, Field Trips, Extracurricular Activities, Seminars, In- and Out-Class oral conservations, Reports, Presentations, and Posters. |
| Assessment methods |
| 1. Examinations, Tests, and Quizzes.  2. Extracurricular Activities.  3. Student Engagement during Lectures.  4. Responses Obtained from Students, Questionnaire about  Curriculum and Faculty Member (Instructor). |
| C. Affective and value goals  C1-- Enabling the student to acquire the skill of thinking in dealing with various engineering problems  C2-- Enabling the student to acquire the skill of thinking in analysis  C3--Enabling the student to acquire the skill of design thinking  C4-- Enabling the student to acquire the skill of thinking in analyzing the results of the tests for mechanical work |
| Teaching and Learning Methods |
| 1. Implementing a training program for a specific period in various work sites  2. Holding specialized seminars and conferences in the department in cooperation with experts from the college and outside it |
| Assessment methods |
| 1. Conducting site visits to various work sites to assess the student’s skills at the site through preparing reports for these visits  2. Holding special seminars for project managers, resident engineers and students to discuss engineering problems, methods of treatment, and how to manage engineering projects. |

9· Learning Outcomes, Teaching, Learning and Assessment Method

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1 - developing students' abilities to acquire the required skills in mechanical

engineering

D2 - Developing and refining the professional personality required of the

student required in different work places

D3- Enabling the student to obtain higher academic degrees through acquiring the basic information required in the major.

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| ***10. Program Structure*** | | | | | |
| **Assessment**  **Method** | **Teaching**  **Method** | **ILOs** | **Unit/Module or**  **Topic Title** | **Hours** | **Week** |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | General concepts in industrial engineering | Industrial EngineeringME405 | 2 | 1 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | General concepts in industrial engineering  +  Quality Concept | Industrial EngineeringME405 | 2 | 2 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Site and arrange industrial unit  +  Quality Concept | Industrial EngineeringME405 | 2 | 3 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Site and arrange industrial unit  +  Quality Concept | Industrial EngineeringME405 | 2 | 4 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Study the economic and technical feasibility +  Quality Concept | Industrial EngineeringME405 | 2 | 5 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Study the economic and technical feasibility  +  Quality Concept | Industrial EngineeringME405 | 2 | 6 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Study the economic and technical feasibility  +  Quality Concept | Industrial EngineeringME405 | 2 | 7 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Depreciation  +  Quality Concept | Industrial EngineeringME405 | 2 | 8 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Forecasting  +  Quality Concept | Industrial EngineeringME405 | 2 | 9 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Breakeven Point  +  Quality Concept | Industrial EngineeringME405 | 2 | 10 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Breakeven Point  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 11 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Breakeven Point  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 12 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Add a new Design  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 13 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Networks Analysis  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 14 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Networks Analysis  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 15 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Networks Analysis  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 16 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Linear Programming  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 17 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Linear Programming  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 18 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Linear Programming  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 19 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Transport Problems  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 20 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Transport Problems  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 21 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Transport Problems  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 22 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Assignment Problems +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 23 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Maintenance and Replacement  +  Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 24 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Maintenance and Replacement  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 25 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Maintenance and Replacement  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 26 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Time Study  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 27 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Time Study  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 28 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Work Study  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 29 |
| Examinations, Tests, and Quizzes | Lectures + Tutorials + H.W + Assignments | Inventory  +  Non – Statistical Methods for Q C | Industrial EngineeringME405 | 2 | 30 |

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| 11. Infrastructure | |
| 1. Books Required reading: | "Fundamental of Industrial Engineering", Mr. Tawfok Al-Medlal Baghdad University 1980 |
| 2. Main references (sources) | 1. Operation Research, H. Taha Macmillan Pub. Comp., 1990  2. Automation Production Systems and Oim, M. P. Groover, Penentice Hall, 2001.  3. Production and Operation Analysis, S. Nahmias, Irwin, 1997.  Manufacturing systems Eng., R. Hitom, Taylor and Francis, 1996 |
| A- Recommended books and references (scientific journals, reports…). | Collection of sheets of solved and  unsolved problems and Exams  questions |
| B-Electronic references, Internet  Sites… | • Available websites related to the subject.  • Extracurricular activities. |

12. The development of the curriculum plan

• Field and scientific visits.

• Extra lectures by foreign guest lecturers.