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 Year 2017-2018

University: Baghdad

College : Engineering

Number Of Departments In The College : 12 Twelve

Date Of Form Completion : April – 3 / 2018

Dean ’s Name

Date : / 4 / 2018

Signature

Dean ’s Assistant For Scientific Affairs

Date : / / 2018

Signature

The College Quality Assurance And University Performance Manager

Date : / / 2018

Signature

Quality Assurance And University Performance Manager

Date : / / 2018

Signature

**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| 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 the program specification. |

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| College of Engineering  University of Baghdad | ***1. Teaching Institution*** |
| Mechanical  Engineering Department (MED) | ***2. University Department/Centre*** |
| **Jet Engines / ME410**  Jet propulsion theory, The fundamental laws, Thrust equation, Fundamentals of jet engines, History of Propulsion Devices and Turbo-machines, Thermodynamic Cycles, Classification of engines types, Ramjet, Turbojet, Turbofan, Engines performance, Propulsion Measures, Power Generation Measures, Various parts of jet engines, Engine cycle analysis (Ramjet, Turbojet, Turbofan), Axial single and multi-stage compressors, Centrifugal compressors, Axial Turbines. | ***3. Course title/code& Description*** |
| B.Sc in Mechanical Engineering | ***4. Programme(s) to which itContributes*** |
| Annual system. There is only one mode of delivery, which is a day program. The students are full time students and on campus. They attend a fill day program on face to face mode. The academic year is composed of 30 weeks regular subjects. | ***5. Modes of Attendance offered*** |
| 2017-2018 | ***6. Semester/Year*** |
| 150 hours / 3 hours per week | ***7. Number of hours tuition (total)*** |
| April 20- 2018 | ***8. Date of production/revision of this specification*** |
| ***9. Aims of the Course*** | |
| Study principles of jet propulsion theory and the types of jet engines based on their thermodynamic characteristics and the main parts of these engines. Understand the main design criteria that have to be taken under consideration for such type of engines. | |

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| ***10·Learning Outcomes*** |
| 1. Understand the main fundamental laws that are used in propulsion theory. 2. Study the physical phenomena of the of the main jet engine items. 3. Understand the main principles that are used for jet engines classification and main characteristics of each type. 4. Study the factors that are used for evaluation engines performance, efficiency and the factor affecting them. 5. Use the mathematical models for calculation the thermodynamic parameters along the jet engines and understand the interaction between these items to ensure their proper performance. 6. Study the main characteristics of the axial compressors and their elementary theory based on thermodynamic properties of the fluid and the interaction of these properties with their dynamic features along its passage through the rotor and stator stages. 7. Study the main characteristics of the centrifugal compressors and their elementary theory based on thermodynamic properties of the fluid and the interaction of these properties with their dynamic features along its passage through the rotor and stator stages. 8. Study the main characteristics of the axial turbines and their elementary theory based on thermodynamic properties of the fluid and the interaction of these properties with their dynamic features along its passage through the rotor and stator stages. |
| ***11.Teaching and Learning Methods*** |
| 1. Lectures 2. Tutorials. 3. Home works. 4. Lab experiments 5. Tests and Exams 6. Seminars. 7. Reports. |
| ***12. Assessment Methods***  1. Examinations, tests and quizzes.  2. Student engagement during lectures.  3. Responses obtained from students according to lecturer questionnaires. |
| ***13. Grading Policy***  1. Quizzes:  - There will be eight quizzes during the academic year. The quizzes will counts 20 degrees of the total course grade.  2. Exams:  - There will be two closed books and notes exam during the academic year. This exam is executed on the mid-term. It counts 20% of the total course grade.  3. Final Exam:  - The final exam will be comprehensive, closed books and notes. It counts 46% of the total course grade.  **GRADING UNITS:**   |  |  | | --- | --- | | **Comprehensive Course Exam** | 20% | | **Quizzes** | 10% | | **Final Course Exam** | 70% | | **Total** | 100% | |

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| ***14. Course Structure*** | | | | | |
| Assessment method | Teaching method | Unit/ model of topic title | LO,s article 12 | hours | Week |
| 1-3 of article 12 | 1-7 of article 11 | Jet propulsion theory, The fundamental laws | 10-1 | 4  2 theo  1 tutotial  1 exp. | 1 |
| 1-3 of article 12 | 1-7 of article 11 | Thrust equation, Fundamentals of jet engines | 10-1 | 4  2 theo  1 tutotial  1 exp. | 2 |
| 1-3 of article 12 | 1-7 of article 11 | History of Propulsion Devices and Turbo-machines | 10-2 | 4  2 theo  1 tutotial  1 exp. | 3 |
| 1-3 of article 12 | 1-7 of article 11 | Thermodynamic Cycles | 10-2 | 4  2 theo  1 tutotial  1 exp. | 4 |
| 1-3 of article 12 | 1-7 of article 11 | Classification of engines types, Ramjet, Turbojet, Turbofan | 10-3 | 4  2 theo  1 tutotial  1 exp. | 5 |
| 1-3 of article 12 | 1-7 of article 11 | Classification of engines types, Ramjet, Turbojet, Turbofan | 10-3 | 4  2 theo  1 tutotial  1 exp. | 6 |
| 1-3 of article 12 | 1-7 of article 11 | Propulsion Measures, Power Generation Measures | 10-4 | 4  2 theo  1 tutotial  1 exp. | 7 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Ram Jet | 10-5 | 4  2 theo  1 tutotial  1 exp. | 8 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Ram Jet | 10-5 | 4  2 theo  1 tutotial  1 exp. | 9 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Ram Jet | 10-5 | 4  2 theo  1 tutotial  1 exp. | 10 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Ram Jet | 10-5 | 4  2 theo  1 tutotial  1 exp. | 11 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Jet Engine | 10-5 | 4  2 theo  1 tutotial  1 exp. | 12 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Jet Engine | 10-5 | 4  2 theo  1 tutotial  1 exp. | 13 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Jet Engine | 10-5 | 4  2 theo  1 tutotial  1 exp. | 14 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Jet Engine | 10-5 | 4  2 theo  1 tutotial  1 exp. | 15 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Turbo Fan | 10-5 | 4  2 theo  1 tutotial  1 exp. | 16 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Turbo Fan | 10-5 | 4  2 theo  1 tutotial  1 exp. | 17 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Turbo Fan | 10-5 | 4  2 theo  1 tutotial  1 exp. | 18 |
| 1-3 of article 12 | 1-7 of article 11 | Engine Cycle Analysis: Turbo Fan | 10-5 | 4  2 theo  1 tutotial  1 exp. | 19 |
| 1-3 of article 12 | 1-7 of article 11 | Axial single and multi-stage compressors | 10-6 | 4  2 theo  1 tutotial  1 exp. | 20 |
| 1-3 of article 12 | 1-7 of article 11 | Axial single and multi-stage compressors | 10-6 | 4  2 theo  1 tutotial  1 exp. | 21 |
| 1-3 of article 12 | 1-7 of article 11 | Axial single and multi-stage compressors | 10-6 | 4  2 theo  1 tutotial  1 exp. | 22 |
| 1-3 of article 12 | 1-7 of article 11 | Axial single and multi-stage compressors | 10-6 | 4  2 theo  1 tutotial  1 exp. | 23 |
| 1-3 of article 12 | 1-7 of article 11 | Centrifugal compressors | 10-7 | 4  2 theo  1 tutotial  1 exp. | 24 |
| 1-3 of article 12 | 1-7 of article 11 | Centrifugal compressors | 10-7 | 4  2 theo  1 tutotial  1 exp. | 25 |
| 1-3 of article 12 | 1-7 of article 11 | Centrifugal compressors | 10-7 | 4  2 theo  1 tutotial  1 exp. | 26 |
| 1-3 of article 12 | 1-7 of article 11 | Centrifugal compressors | 10-7 | 4  2 theo  1 tutotial  1 exp. | 27 |
| 1-3 of article 12 | 1-7 of article 11 | Axial Turbines | 10-8 | 4  2 theo  1 tutotial  1 exp. | 28 |
| 1-3 of article 12 | 1-7 of article 11 | Axial Turbines | 10-8 | 4  2 theo  1 tutotial  1 exp. | 29 |
| 1-3 of article 12 | 1-7 of article 11 | Axial Turbines | 10-8 | 4  2 theo  1 tutotial  1 exp. | 30 |

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| ***15. Infrastructure*** | | |
| 1. **Fundamentals of Jet Propulsion and their applications / Roland D. Flack, CAMBRIDGE University press /1st printing/ 2005**   **References:**  **1. Mechanics and thermodynamics of propulsion / Philip G. Hill $ Carl R Peterson/ ADDISON WEISLY publishing company / 3rd printing / 1970** | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER | |
| 1. Experimental tests in Heat and Fluid Labs. 2. Available websites related to subject. | Special requirements (include for example workshops, periodicals ,IT software, websites) | |
| 1. Demonstrations related to practical examples. 2. Scientific visits. | Community-based facilities  (include for example, guest  Lectures , internship, field studies) | |
| ***16. Admissions*** | | |
| ME202 & ME203 | | Pre-requisites |
| / | | Minimum number of students |
| 11 | | Maximum number of students |
| Lecturer Dr. Iman Jabbar | | ***17. Course Instructors*** |

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