**TEMPLATE FOR COURSE SPECIFICATION**

**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 programme specification. These are review of thermodynamics properties of humid air, conservation laws of mass and energy, air conditioning processes and psychometry, thermal comfort, heating and cooling load calculations, Design of air and water distribution systems, air conditioning systems. |

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| University of Baghdad | **1. Teaching Institution** |
| Engineering college - Surveying Dept. | **2. University Department/Centre** |
| Cartography  | **3. Course title/code& Description** |
| 4 stage  | **4. Programme(s) to which it Contributes** |
| Annual  | **5. Modes of Attendance offered** |
| First & Second /2017-2018 | **6. Semester/Year** |
| 120 hours | **7. Number of hours tuition (total)** |
| 12-10-2017 | **8. Date of production/revision of this specification** |
| **9. Aims of the Course** |
| Studying the students the fundamentals and applications of air conditioning & refrigeration. Also providing him the ability for doing research and development, design and consultation. The student will be capable of understanding the air conditioning processes that represent different air conditioning systems practically, and applying the conservation laws for these processes. Also the student will be capable of calculation the heating and cooling loads of building for the specified factors that affecting thermal comfort in air conditioning zones and ambient climate data, and finally the student will be capable of designing the air and water distribution systems. The student will be able of conducting the laboratory experiments on psychrometric air conditioning processes and analyze the functional test of them. **10·Learning Outcomes,** **Teaching ,Learning and Assessment Method** |

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| 1. Knowledge and Understanding

A1. an ability to use the properties tables of moist air, saturated water and refrigerants.A2.an ability to use psychrometric chart, and to analyze the simple airconditioning processes and basic cycles.A3. an ability to use pressure-enthalpy chart, and to analyze the vapour compression and absorption refrigeration cycles. A4. an ability to apply the conservation laws for air-conditioning processes and vapour compression and absorption refrigeration cycles.A5. an ability to calculate heating and cooling loads due to internal loads for a building using the ASHRAE method.A6. an ability to design air ducting systems and water piping network and selecting of air fans and water pumps.A7. an ability to analyze and test central air conditioning systems and to analyze and select air conditioning & refrigeration equipments.A8. an ability to conduct experiments, as well as to analyze and interpret data.A9. an ability to identify, formulate, and solve engineering problems.A10. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. |
|   B. Subject-specific skillsB1**. apply a rule** & reflective practiceB2. **construct the model** B3. solve problemsC. Thinking Skills C1.d**efine the cases**  C2.classify **the** materials C3.create a new ideasD. General and Transferable Skills (other skills relevant to employability and personal development)  D1.communication D2 decision D3.intiative |
| **11.Teaching and Learning Methods**Discussion ,explain and examples |
| **12. Assessment Methods**  Exam, homework , class work |
| **13. Grading Policy** |

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| **14.** **Course Structure** |
| Assessment Method | TeachingMethod | Unit/Module or Topic Title | ILOs | Hours | Week |
| Exam, home work , and class work | Discussion ,explain and examples | Introduction to air conditioning(AC) | A,B,C, D | 4 | 1 |
| // | // | The main properties of moist air | // | 4 | 2 |
| // | // | Introduction to refrigeration | // | 4 | 3 |
| // | // | Conservation laws for AC processes | // | 4 | 4 |
| // | // | Vapor refrigeration system | // | 4 | 5 |
| // | // | The psychometry of AC processes | // | 4 | 6 |
| // | // | The psychometry of AC processes | // | 4 | 7 |
| // | // | Human and comfort | // | 4 | 8 |
| // | // | Vapor refrigeration system | // | 4 | 9 |
| // | // | Air conditioning equipment | // | 4 | 10 |
| // | // | Vapor refrigeration system | // | 4 | 11 |
| // | // | Thermal resistance of materials | // | 4 | 12 |
| // | // | Refrigerants | // | 4 | 13 |
| // | // | Heating load calculation | // | 4 | 14 |
| // | // | Authors Refrigeration Systems | // | 4 | 15 |
| // | // | Heat gain through building envelope | // | 4 | 16 |
| // | // | Authors refrigeration systems | // | 4 | 17 |
| // | // | Cooling load calculation | // | 4 | 18 |
| // | // | Cooling load calculation | // | 4 | 19 |
| // | // | Cooling load calculation | // | 4 | 20 |
| // | // | Design of air ducting systems | // | 4 | 21 |
| // | // | Design of air ducting systems |  | 4 | 22 |
| // | // | Authors refrigeration systems |  | 4 | 23 |
| // | // | Design of water piping systems |  | 4 | 24 |
| // | // | Cold and freeze stores |  | 4 | 25 |
| // | // | Design of water piping systems |  | 4 | 26 |
| // | // | Air conditioning systems |  | 4 | 27 |
| // | // | Refrigeration equipment |  | 4 | 28 |
| // | // | Air conditioning controls |  | 4 | 29 |
| // | // | Calculation using software packages |  | 4 | 30 |

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| **15. Infrastructure** |
| - Heating, Ventilating and Air Conditioning, Mc Quiston- Refrigeration Systems and Applications, Ibrahim- Air Conditioning Engineering*,* Jones | Required reading:· CORE TEXTS· COURSE MATERIALS· OTHER |
| - workshops- software- websites | Special requirements (include for example workshops, periodicals, IT software, websites) |
| - guest lectures- internship- field studies | Community-based facilities(include for example, guestLectures , internship , field studies) |

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| **16. Admissions** |
| Pass third stage | Pre-requisites |
| 35 student | Minimum number of students |
| 45 student | Maximum number of students |
| Asst. Prof. Dr. Najim Abid Jasim | **17. Course Instructors** |