**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. |

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| University of Baghdad - College of Engineering | 1. Teaching Institution |
| Chemical Engineering Department | 2. University Department/Centre |
| Basic principles of chemical engineering 2 – Chem. E.244 | 3. Course title/code |
| Chemical Engineering Programs | 4. Programme(s) to which it contributes |
| Yearly system with full study | 5. Modes of Attendance offered |
| 1st & 2nd / Academic Year 2017 – 2018 | 6. Semester/Year |
| 120 hour / 4 hour per weak | 7. Number of hours tuition (total) |
| 10/10/2017 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| 1. Study Real gas relationships and gas mixture 2. Study Forms of energy and Latent heat of vaporization 3. Knowing the First law of thermodynamic 4. Define Standard heat of reaction ,Types of systems ,Heat capacity 5. Material balances with chemical reaction review 6. Study material balances with recycle , by pass and purge. 7. Energy balance without and with chemical reaction 8. Humidity charts and their uses 9. Heat of solution, Enthalpy-concentration charts and their uses. 10. Material and energy balance for complete projects. 11. Unsteady state material balance , 12. Unsteady State energy balance. | |

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| 10· Learning Outcomes, Teaching ,Learning and Assessment Methode |
| 1. Knowledge and Understanding   A1. Calculation Real gas relationships and gas mixture.  A2. Define Forms of energy and the First law of thermodynamic  A3. Using Energy balance without and with chemical reaction  A4. Using Humidity charts  A5. Enthalpy-concentration charts and their uses  A6. Knowing how to balance unsteady material and energy systems |
| B. Subject-specific skills  B1. Solve problems for real gas and their mixture  B2. Using diagrams and chart for calculation Humidity and heat of solution  B3. Used unsteady state balances for solving systems |
| C. Thinking Skills  C1. Learning the basic calculation and principles in chemical engineering  C2. Using mathematical methods for solving material and energy balances  C3. Solving unsteady state models |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1. Activity with society  D2. The work with a team  D3. How engineering is benefit for society and environment |
| Teaching and Learning Methods |
| 1. Lectures 2. Class work 3. Home work 4. Daily and monthly exams 5. Problem answers 6. Meeting |
| Assessment methods |
| 1. Daily and monthly exams 2. Outside lecture teaching 3. Students problem answers 4. Students notes |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| 1-4 of article (10) | 1-9 of article (1) | Real gas relationships and gas mixture | A1 | 4 Hours  2 Theoretical  2 Tutorial | 1 |
| 1-4 of article (10) | 1-9 of article (1) | Real gas relationships and gas mixture | A1 | 4 Hours  2 Theoretical  2 Tutorial | 2 |
| 1-4 of article (10) | 1-9 of article (1) | Forms of energy | B1 | 4 Hours  2 Theoretical  2 Tutorial | 3 |
| 1-4 of article (10) | 1-9 of article (1) | Latent heat of vaporization | A2,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 4 |
| 1-4 of article (10) | 1-9 of article (1) | First law of thermodynamic | A2,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 5 |
| 1-4 of article (10) | 1-9 of article (1) | Standard heat of reaction | A2,A3,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 6 |
| 1-4 of article (10) | 1-9 of article (1) | Types of systems | A2,A3,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 7 |
| 1-4 of article (10) | 1-9 of article (1) | Heat capacity | A2,A3,  B2 | 4 Hours  2 Theoretical  2 Tutorial | 8 |
| 1-4 of article (10) | 1-9 of article (1) | Energy balance without chemical reaction | A2,A3,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 9 |
| 1-4 of article (10) | 1-9 of article (1) | Energy balance with chemical reaction | A2,A3,  B1 | 4 Hours  2 Theoretical  2 Tutorial | 10 |
| 1-4 of article (10) | 1-9 of article (1) | Material balances with chemical reaction review | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 11 |
| 1-4 of article (10) | 1-9 of article (1) | Study material balances with recycle , by pass and purge | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 12 |
| 1-4 of article (10) | 1-9 of article (1) | Material and energy balances | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 13 |
| 1-4 of article (10) | 1-9 of article (1) | Material and energy balances | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 14 |
| 1-4 of article (10) | 1-9 of article (1) | Heat of solution | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 15 |
| 1-4 of article (10) | 1-9 of article (1) | Enthalpy-concentration charts and their uses | A2,A3,A4  B1 | 4 Hours  2 Theoretical  2 Tutorial | 16 |
| 1-4 of article (10) | 1-9 of article (1) | Definitions of different kinds of humidity | B2 | 4 Hours  2 Theoretical  2 Tutorial | 17 |
| 1-4 of article (10) | 1-9 of article (1) | Humidity charts and their uses | B2 | 4 Hours  2 Theoretical  2 Tutorial | 18 |
| 1-4 of article (10) | 1-9 of article (1) | Material and energy balance for complete projects. | B2 | 4 Hours  2 Theoretical  2 Tutorial | 19 |
| 1-4 of article (10) | 1-9 of article (1) | Unsteady state material balance | A5 | 4 Hours  2 Theoretical  2 Tutorial | 20 |
| 1-4 of article (10) | 1-9 of article (1) | Unsteady State energy balance | A5 | 4 Hours  2 Theoretical  2 Tutorial | 21 |

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| 12. Infrastructure | |
|  | Required reading:  Basic principles and calculations in chemical engineering 7th edition,by David M.Himmeblau the University of Texas.  1. Supplementry problems for basic principles and calculations in chemical engineering 6th edition,by David M.Himmeblau the University of Texas(1996).  2.Elementary principles of chemical processes 3ed edition(2005)  3.Richard M.Felder ,Ronald W.Rousseau.  Others  Lecture notes  Students answers for problems |
| Internet knowledge for chemical engineering | Special requirements (include for example workshops, periodicals, IT software, websites) |
| internship, field studies | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
|  | Pre-requisites |
|  | Minimum number of students |
| 75 | Maximum number of students |