**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 programmer specification. |

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| College of Engineering/ University of Baghdad | 1. Teaching Institution |
| Chemical Engineering | 2. University Department/Centre |
| PROCESS DYNAMICS AND CONTROL | 3. Course title/code |
| Chemical Engineering Program | 4. Programme(s) to which it contributes |
| 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 full day program in face-to-face mode. The academic year is composed of 30-week regular subjects. | 5. Modes of Attendance offered |
| 1st & 2nd / Academic Year 2017-2018 | 6. Semester/Year |
| 90 hrs. /3 hrs. per week | 7. Number of hours tuition (total) |
| 10-10-2017 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| 1-To study the first order systems response, Time delay, Steady state coefficient. | |
| 2- Understand, the final value theorem, 2nd order system. | |
| 3- Learn how to use the Closed loop systems, Transfer function and flow diagram. | |
| 4-To study the Air control valve. | |
| 5- Understand the proportional, integral, differential controlar. | |
| 6- To study the Optimum control by zegler nickes method, stability, Routh method. | |
| 7**-**To learn Frequency response bode and niquist diagram . | |

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| 10· Learning Outcomes, Teaching ,Learning and Assessment Methode |
| 1. Knowledge and Understanding   A1.  A2.  A3.  A4.  A5.  A6 . |

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| B. Subject-specific skills  B1. Solve process control examples .  B2. Learn graphical methods to solve problems.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  C. Thinking Skills  C1. Developing critical and creative thinking skills related process control in chemical engineering.  C2. Using mathematical models.  C3. Analysis assumptions.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  D General and Transferable Skills (other skills relevant to employability and personal development) .  D1. Communitiy effectivity.  D2. Work individually and team members in international and multidicplinary teams.  D3. Understanding impact of engineering solutions in an environmental and social context. |
| Teaching and Learning Methods |
| 1. Lectures. 2. Tutorials. 3. Homework and Assignments. 4. Tests and Exams. 5. In-Class Questions and Discussions. 6. Connection between Theory and Application. 7. Field Trips. 8. Seminars. 9. In- and Out-Class oral conservations. |
| Assessment methods |
| 1. Examinations, Tests, and Quizzes. 2. Extracurricular Activities. 3. Student Engagement during Lectures. 4. Responses Obtained from Students |
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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 (10) | 1st order response | A1 | 3  2the.  1 tut. | 1 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Time delay | A1 | 3  2the.  1 tut. | 2 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Steady state coefficient | B1 | 3  2the.  1 tut. | 3 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Final value theorem | A2,B1 | 3  2the.  1 tut. | 4 |
| 1 – 4 of article (10) | 1-9 of  article (10) | 2nd order system | A2,B1 | 3  2the.  1 tut. | 5 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Closed loop systems | A2,B1 | 3  2the.  1 tut. | 6 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Transfer function and flowdiagram | A2,A3,B1 | 3  2the.  1 tut. | 7 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Air control valve | A2,A3,B1 | 3  2the.  1 tut. | 8 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Control system | A2,A3,B1 | 3  2the.  1 tut. | 9 |
| 1 – 4 of article (10) | 1-9 of  article (10) | discontinuous | A2,A3,B1 | 3  2the.  1 tut. | 10 |
| 1 – 4 of article (10) | 1-9 of  article (10) | proportional | A2,A3,A4,B1 | 3  2the.  1 tut. | 11 |
| 1 – 4 of article (10) | 1-9 of  article (10) | integral | A2,A3,A4,B1 | 3  2the.  1 tut. | 12 |
| 1 – 4 of article (10) | 1-9 of  article (10) | differential | A2,A3,A4,B1 | 3  2the.  1 tut. | 13 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Optimum control by zegler nickes method | A2,A3,A4,B1 | 3  2the.  1 tut. | 14 |
| 1 – 4 of article (10) | 1-9 of  article (10) | stability | A2,A3,A4,B1 | 3  2the.  1 tut. | 15 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Routh method | A2,A3,A4,B1 | 3  2the.  1 tut. | 16 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Frequency response bode and niquist diagram. | B2 | 3  2the.  1 tut. | 17 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Measuring devices of temperature. | B2 | 3  2the.  1 tut. | 18 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Measuring devices of pressure. | B2 | 3  2the.  1 tut. | 19 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Measuring devices of Concentration. | A5 | 3  2the.  1 tut. | 20 |
| 1 – 4 of article (10) | 1-9 of  article (10) | Measuring devices of Fluid flow. | A5 | 4  2 the.  1tut. | 21 |

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| 12. Infrastructure | |
| *Textbook*: Process systems analysis and control by coughanowr&koppel  *References*:1. Essentials of process control by William l luyben.2. Process systems analysis and control by donald r coughanowr.3. Process control by mykeking.  *Others*   1. Notebook prepared by the instructor of the course. 2. Collection of tutorial sheets of solved and unsolved problems and Exams questions. | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| Available websites related to the subject | Special requirements (include for example workshops, periodicals, IT software, websites) |
| Field and scientific visits | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
|  | Pre-requisites |
| 60 | Minimum number of students |
| 75 | Maximum number of students |

***Instructor:***

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