**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 onemode of delivery, which is a “DayProgram”. 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 skillsB1. 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.
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|  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 | TeachingMethod | Unit/Module or Topic Title | ILOs | Hours | Week |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | 1st order response | A1 | 32the.1 tut. | 1 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Time delay | A1 | 32the.1 tut. | 2 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Steady state coefficient | B1 | 32the.1 tut. | 3 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Final value theorem | A2,B1 | 32the.1 tut. | 4 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | 2nd order system | A2,B1 | 32the.1 tut. | 5 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Closed loop systems | A2,B1 | 32the.1 tut. | 6 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Transfer function and flowdiagram | A2,A3,B1 | 32the.1 tut. | 7 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Air control valve | A2,A3,B1 | 32the.1 tut. | 8 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Control system | A2,A3,B1 | 32the.1 tut. | 9 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | discontinuous | A2,A3,B1 | 32the.1 tut. | 10 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | proportional | A2,A3,A4,B1 | 32the.1 tut. | 11 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | integral | A2,A3,A4,B1 | 32the.1 tut. | 12 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | differential | A2,A3,A4,B1 | 32the.1 tut. | 13 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Optimum control by zegler nickes method | A2,A3,A4,B1 | 32the.1 tut. | 14 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | stability | A2,A3,A4,B1 | 32the.1 tut. | 15 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Routh method | A2,A3,A4,B1 | 32the.1 tut. | 16 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Frequency response bode and niquist diagram. | B2 | 32the.1 tut. | 17 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Measuring devices of temperature. | B2 | 32the.1 tut. | 18 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Measuring devices of pressure. | B2 | 32the.1 tut. | 19 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Measuring devices of Concentration. | A5 | 32the.1 tut. | 20 |
| 1 – 4 of article (10) | 1-9 ofarticle (10) | Measuring devices of Fluid flow. | A5 | 42 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, guestLectures , internship , field studies) |

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

***Instructor:***

**Asst. Prof. Dr. Najwa Saber Majeed**

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