**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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| College of Engineering/ University of Baghdad | 1. Teaching Institution |
| Chemical Engineering | 2. University Department/Centre |
| Petroleum Refining Industry | 3. Course title/code |
| Chemical Engineering Program | 4. Programme(s) to which it contributes |
| Full time | 5. Modes of Attendance offered |
| Academic Year 2017-2018 | 6. Semester/Year |
| 120 hrs.( 4 hrs. per week) | 7. Number of hours tuition (total) |
| 1-10-2017 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| 1. Introduction of the principles of chemical engineering to the petroleum refining industry 2. Understand the theory of modern refinery operations 3. Understanding the order in which the crude oil flows through the refinery processes to show the purposes and interrelationships of the units 4. Use a computation methods for design the unite. 5. Explore the modern petroleum refinery application such as catalytic cracking, catalytic reforming, and hydrocracking processes 6. Covering the practical application of scientific knowledge and empirical relationships. | |

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| 10· Learning Outcomes, Teaching ,Learning and Assessment Method |
| 1. Knowledge and Understanding   A1.Calculate the Physical properties of crude oil and petroleum refinery products at any given temperature.  A2. Define the reaction rates and the rate equation.  A3. Use two procedure methods for analyzing kinetic data, the integral and differential.  A4. Unit design for all types of reactors in the petroleum refinery processes |
| B. Subject-specific skills  B1. Help student to develop a range of graduate attributes.  B2. Develop subject-specific skills for student through taking part in lectures, seminars, field-trips, completing assignments, projects, dissertations and outreach work.  B3. Student may take the opportunity to become involved in Department events and research seminar (or another college). |
| Teaching and Learning Methods |
| 1.Facilitating the integration of knowledge, skills and attitudes o teaching and learning in groups 2. Facilitating learning and setting ground rules 3.Explaining  4. Group dynamics 5.Managing the group 6.Lectures 7. Small group teaching methods and discussion techniques  8. Seminars and tutorials 9. Computer based teaching and learning – information technology and the World Wide Web 10. Introducing problem based learning 11. Case based learning and clinical scenarios  References, further reading and useful links |
| Assessment methods |
| 1. Exams. This includes mid-term exams, final exams, and tests at the end of course units. The best tests include several types of questions – short answer, multiple-choice, true-false, and short essay – to allow students to fully demonstrate what they know. 2. Papers, projects, and presentations. These give students the chance to go deeper with the material to put the knowledge they’ve acquired to use or create something new from it. This level of application is an extremely important and often overlooked part of the learning process. These types of projects also give students who do not test well a chance to shine. 3. Portfolios. Submitting a portfolio at the end of a course can be a powerful way for students to see the progress they’ve made.  More than just a collection of students' work from the semester, good portfolios also include reflections on their learning. Asking students to spell out the concepts or techniques used with each piece, the themes addressed, and hurdles faced also brings a sense of completion to the learning process |
| C. Thinking Skills  C1.Thinking Skills are the mental processes we use to do things like: solve problems, make decisions, ask questions, make plans, pass judgements, organise information and create new ideas.  C2. Starting lessons with a puzzle or game can be a useful warm-up, but another possibility is to try some brain gym, a series of exercises and massage routines designed to increase the supply of oxygen to the brain and improve mental alertness  C3. Learn the students to use Mind-maps method which can be a useful tool for note-taking or revision, for thinking through a complex problem or for presenting information to others. |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1. Setting appropriate achievement levels can ensure that all students attain the adequate level of transferable skills for a qualification that will allow them to work in their chosen occupation. Achievement levels need to be set based on industry participation and should be reviewed regularly.  D2. **Making learning environments as “real’ as possible**  D3. To create a well-functioning, credible assessment system, students’ assessment records will have to be stored and made accessible to relevant stakeholders. Having students retake tests to assess their transferable skills when, for instance, changing schools, can create frustration and cynicism about the system |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| 1 – 3 | 1-12 of | Crude Oils | A1,D3 | 4  2 the.  2 tut. | 1 |
| 1 – 3 | 1-12 of | Crude Oils | A1, D2 | 4  2 the.  2 tut. | 2 |
| 1 – 3 | 1-12 of | Chemical composition | B1 | 4  2 the.  2 tut. | 3 |
| 1 – 3 | 1-12 of | Physical and chemical characteristic | A2,B1 | 4  2 the.  2 tut. | 4 |
| 1 – 3 | 1-12 of | Physical and chemical characteristic | A2,B1 | 4  2 the.  2 tut. | 5 |
| 1 – 3 | 1-12 of | Thermal processes | A2,B1 | 4  2 the.  2 tut. | 6 |
| 1 – 3 | 1-12 of | Thermal processes | A2,A3,B1 | 4  2 the.  2 tut. | 7 |
| 1 – 3 | 1-12 of | Catalytic processes | A2,A3,B1 | 4  2 the.  2 tut. | 8 |
| 1 – 3 | 1-12 of | Catalytic processes | A2,A3,B1 | 4  2 the.  2 tut. | 9 |
| 1 – 3 | 1-12 of | Catalytic processes | A2,A3,B1 | 4  2 the.  2 tut. | 10 |
| 1 – 3 | 1-12 of | Conventional chemical treatment of refinery products | A2,A3,A4,B1 | 4  2 the.  2 tut. | 11 |
| 1 – 3 | 1-12 of | Conventional chemical treatment of refinery products | A2,A3,A4,B1 | 4  2 the.  2 tut. | 12 |
| 1 – 3 | 1-12 of | Lubricating Oils | A2,A3,A4,B1 | 4  2 the.  2 tut. | 13 |
| 1 – 3 | 1-12 of | Production of Gasoil | A2,A3,A4,B1 | 4  2 the.  2 tut. | 14 |
| 1 – 3 | 1-12 of | Production of solvent | A2,A3,A4,B1 | 4  2 the.  2 tut. | 15 |
| 1 – 3 | 1-12 of | Production of Car and aero plane gasoline | A2,A3,A4,B1 | 4  2 the.  2 tut. | 16 |
| 1 – 3 | 1-12 of | Production of Jet fuel | B2 | 4  2 the.  2 tut. | 17 |
| 1 – 3 | 1-12 of | Production of Kerosen | B2 | 4  2 the.  2 tut. | 18 |
| 1 – 3 | 1-12 of | Production of diesel | B2 | 4  2 the.  2 tut. | 19 |
| 1 – 3 | 1-12 of | Production of Asphalt | A5 | 4  2 the.  2 tut. | 20 |
| 1 – 3 | 1-12 of | Production of Wax | A5 | 4  2 the.  2 tut. | 21 |

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| 12. Infrastructure | |
| ***Textbook***  Petroleum refinery Engineering By W.L. Nelson  ***References***   1. Petroleum Refining Technology and Economics by H. Gary   ***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 |
|  | Special requirements (include for example workshops, periodicals, IT software, websites) |
| Available websites related to the subject, Video, Seminars, field trips | 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 |

***Instructor:***

**Ass.Prof.Dr. HUSSEIN KASSIM HUSSEIN**

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