Republic of Iraq

Ministry of Higher Education & Scientific Research Supervision and Scientific Evaluation Directorate Quality Assurance and Academic Accreditation

International Accreditation Dept.

Academic Program Specification Form For The

Academic

University of Baghdad

College : Engineering

Number Of Departments In The College :

Date Of Form Completion : 28-1-2021

Dean ’s Name

Date : / /

Signature

Dean ’s Assistant For

Scientific Affairs

Date : / / Signature

The College Quality Assurance

And University Performance

Manager Date : / / Signature

Quality Assurance And University Performance Manager

Date : / / Signature

**TEMPLATE FOR PROGRAMME SPECIFICATION**

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Prof. Dr. Ahmed Abed Mohammed

**PROGRAMME SPECIFICATION**

**Give basic concepts for students about the details of mass transfer**

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| 1. Teaching Institution | Collage of Engineering |
| 2. University Department/Centre | Department of Environmental Engineering |
| 3. Course title/code | Mass transfer |
| 4. Modes of Attendance offered | 2 days per week electronic |
| 5. Semester/Year | Year |
| 6. Number of hours tuition (total) | 90 |
| 7. Date of production/revision of this specification | 2019 |
| **8. Aims of the Course** | |
| 1. Understanding the fundamental concepts of mass transfer principles and to apply those concepts to real engineering problems. | |
| 2- This course will provide an overview of mass transfer operations at basic to an intermediate level. Coverage will be relatively broad | |

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| **9. Learning Outcomes, Teaching, Learning and Assessment Methods** |
| A. Cognitive goals  A1.The goal is to provide students with the theoretical/analytical background to understand mass transfer operations and to tackle the sort of complex problems. |
| B. The skills goals special to the Course  B1. Students will learn about the diffusional mass transfer  B2. Operation of cooling tower will be clearly understood  B3. Operation of Dryer will be understood  B4.Student will understand the mechanism of crystallization and absorption |
| **Teaching and Learning Methods** |
| Classroom teaching will involve black board, power point presentations, and case study analysis. |
| **Assessment methods** |
| Homework related to problem solving |
| C. Affective and value goals  C1. Optimization of solid waste transport , treatment and disposal techniques  C2. Economics of the onsite vs. offsite waste management options  C3. Prepare students for successful careers in environmental engineering |
| **Teaching and Learning Methods** |
| Intensive studies of regulations |
| **Assessment methods** |
| Case study |

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| **D. General and Transferable Skills (other skills relevant to employability and personal development)** D1. Become more effective, independent and confident self-directed learnersD2. Improve their general skills for study and career management D3. Articulate personal goals and evaluate progress towards their achievement  D4. An ability to identify, formulate, and solve engineering problems |

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| **10. Course Structure** | | | | | |
| **Week** | **Hours** | **ILOs** | **Unit/Module or**  **Topic Title** | **Teaching**  **Method** | **Assessment**  **Method** |
| **1** | **3** | **General introduction** | **General introduction** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **2** | **3** | **Diffusional mass transfer** | **Diffusional mass transfer** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **3** | **3** | **Diffusional mass transfer** | **Diffusional mass transfer** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **4** | **3** | **Ficks law of diffusion** | **Ficks law of diffusion** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **5** | **3** | **Ficks law of diffusion** | **Ficks law of diffusion** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **6** | **3** | **Application to environmental problems** | **Application to environmental problems** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **7** | **3** | **Application to environmental problems** | **Application to environmental problems** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **8** | **3** | **Diffusion in concentrated solutions** | **Diffusion in concentrated solutions** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **9** | **3** | **Diffusion in concentrated solutions** | **Diffusion in concentrated solutions** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **10** | **3** | **Diffusion through semi-infinte mediums** | **Diffusion through semi-infinte mediums** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **11** | **3** | **Diffusion through semi-infinte mediums** | **Diffusion through semi-infinte mediums** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **12** | **3** | **Diffusion coupled with chemical reaction** | **Diffusion coupled with chemical reaction** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **13** | **3** | **Diffusion coupled with chemical reaction** | **Diffusion coupled with chemical reaction** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **14** | **3** | **Concept of mass transfer coefficients** | **Concept of mass transfer coefficients** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **15** | **3** | **Concept of mass transfer coefficients** | **Concept of mass transfer coefficients** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **16** | **3** | **Mass transfer correlations** | **Mass transfer correlations** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **17** | **3** | **Mass transfer correlations** | **Mass transfer correlations** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **18** | **3** | **Application to engineering problems** | **Application to engineering problems** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **19** | **3** | **Application to engineering problems** | **Application to engineering problems** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **20** | **3** | **Mass transfer across interface** | **Mass transfer across interface** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **21** | **3** | **Mass transfer across interface** | **Mass transfer across interface** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **22** | **3** | **Overall mass transfer coefficient** | **Overall mass transfer coefficient** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **23** | **3** | **Overall mass transfer coefficient** | **Overall mass transfer coefficient** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **24** | **3** | **Absorption and Stripping** | **Absorption and Stripping** |  | **Questions during the lectures ,quiz, exam, present in the class** |
| **25** | **3** | **Absorption and Stripping** | **Absorption and Stripping** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **26** | **3** | **Design of absorption tower** | **Design of absorption tower** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **27** | **3** | **Design of absorption tower** | **Design of absorption tower** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **28** | **3** | **Adsorption** | **Adsorption** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **29** | **3** | **adsorption** | **adsorption** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |
| **30** | **3** | **Leaching** | **Leaching** | **Electronic** | **Questions during the lectures ,quiz, exam, present in the class** |

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| 11. **Infrastructure** | |
| **1. Books Required reading:** | 1. **Transport process and separation process principles by geankoplis.** 2. **Mass transfer operation by treybal.** 3. **Chemical engineering volume 1&2 coulson & Richardson.** |
| **2. Main references (sources)** | * **Principles of unit operation by foust.** * **Separation process principles by seader.** |
| **A- Recommended books and references (scientific journals, reports…).** | **Heat and mass transfer journal** |
| **B-Electronic references, Internet**  **sites…** | https://www.routledge.com/Diffusion-and-Mass-Transfer/Vrentas-Vrentas/p/book/9781466515680 |