**TEMPLATE FOR COURSE SPECIFICATION**

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Lecturer Dr. Hussein Jabar Khadim

**COURSE SPECIFICATION**

This course introduces the description of the environmental ecology. Topic covered: Principles of general ecology, Biochemical pathways**,** Kinetics ecosystem structure and function**,** Nutrient cycling**,** Development and application of mass balance for Lake Eutrophication, Preliminary design of waste ponds and constructed wetlands**,** Transfer of toxic chemicals in food webs

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| 1. Teaching Institution | University of Baghdad/ College of Engineering |
| 2. University Department/Centre | Environmental Engineering Department |
| 3. Course title/code | Ecology |
| 4. Modes of Attendance offered | 2 days per week electronic |
| 5. Semester/Year | Semester |
| 6. Number of hours tuition (total) | 30 h |
| 7. Date of production/revision of thisspecification |  |
| 8. Aims of the Course |
| The main aim of this course are |
| * Introduce to student the basic concept of Ecology
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| * Describe the general principal involve of Environmental ecology
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9· Learning Outcomes, Teaching ,Learning and Assessment Method

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| A- Cognitive goals.

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| A1. After completion of the course students should be able to characterization of ecology |
| A2. analysis of ecology constituents including QA/QC issues. |

 A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes. |
| B. The skills goals special to the course.

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| B1.Understand Principles of general ecology |
| B2. Development and application of mass balance for lake eutrophication and resource recovery/recycling, transport. |

 B3.Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches |
| Teaching and Learning Methods |
| More description of case studies and applications |
| Assessment methods |
| Homework related to problem solving  |
| C. Affective and value goals

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| C1. Describe the general principal involve of Environmental ecology |
| C2. Economics of the onsite vs. offsite waste management optionsC3.Prepare students for successful careers in environmental engineering |

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| Teaching and Learning Methods |
| Intensive studies of regulations |
| Assessment methods |
|  Case studies  |

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

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| D1. Become more effective, independent and confident self-directed learners |
| D2. Improve their general skills for study and career managementD3. Articulate personal goals and evaluate progress towards their achievementD4.An ability to identify, formulate, and solve engineering problems |

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| 10. Course Structure |
| Week | Hours | ILOs | Unit/Module orTopic Title | TeachingMethod | AssessmentMethod |
| 1 | 2 | Definition of ecology | Principles of general ecology | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 2 | 2 | Definition of ecology | Principles of general ecology | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 3 | 2 | Energy flow | Biochemical pathways | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 4 | 2 | Energy flow | Biochemical pathways | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 5 | 2 | Mass flow | Kinetics ecosystem structure and function | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 6 | 2 | Nutrient cycling | Kinetics ecosystem structure and | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 7 | 2 |  | Nutrient cycling | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 8 | 2 | Nutrient cycling | Nutrient cycling | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 9 | 2 | Nutrient cycling | Development and application of mass balance for lake eutrophication | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 10 | 2 | mass balance | Development and application of mass balance for lake | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 11 | 2 | mass balance | Preliminary design of waste ponds and constructed wetlands | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 12 | 2 | mass balance | Preliminary design of waste ponds and constructed wetlands | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 13 | 2 | Methods of treatment | Transfer of toxic chemicals in food webs | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 14 | 2 |  | Review | Electronic | Questions during the lectures ,quiz, exam, present in the class |
| 15 | 2 |  | Mid exam | Electronic |  |

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| 11. Infrastructure |
| 1. Books Required reading: | * Introduction to Environmental Engineering and Science by G. Masters and W. Ela
* Environmental Engineering by G. Kiely
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| 2. Main references (sources) | * Fundamental of Ecology by P. Odum and W. Barrett
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| A- Recommended books and references (scientific journals, reports…). | Journals 1. International Journal of Ecology 2. Ecology |
| B-Electronic references, Internet sites… | <https://www.epa.gov><https://youtube.com> |

12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling through taking 2 courses instead of one