#### Course Title: Aqua-cultural Engineering

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| **University** | **Benha** |
| **Faculty** | **Faculty of Agriculture** |
| **COURSE SPECIFICATIONS:** | |
| Program on which the course is given | Agric. biotechnology |
| Major or Minor element of Program |  |
| Departments offering the Program |  |
| Department offering the course | Agric. And Biosystems engineering |
| Academic year / Level | Level 3/1st semester |
| Date of specification approval |  |

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| **A- BASIC INFORMATION** | |
| Title | Aqua-cultural Engineering |
| Code | AE 1105 |
| Credit Hours | 28 |
| Lecture | 2 Hours / week |
| Practical | 2 Hours / week |
| Total: | 28 Hours |

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| **B- PROFESSIONAL INFORMATION** |
| **1 – OVERALL AIMS OF COURSE** |
| Students will be taught the engineering principles to enable them to understand design and operate different types of aquaculture farming systems. |

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| **2 – Intended Learning Outcomes of Course (ILOs)** |
| **A. Knowledge and Understanding:** |
| ***By the end of the course, students should:***   * Be awareness of aqua-farming, water quality, and aqua-cultural systems * Understand the basic knowledge of the aqua-cultural systems design and operation. * Have the recent information about modern aqua-cultural systems. |

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| B. Intellectual Skills: |
| ***Successful completion of this course will allow students to:***   * Determining the most important parameters in the aqua-cultural systems. * Understanding requirements of the aqua-cultural systems. * How to select the site of the aqua-cultural systems. |

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| C. Professional and Practical Skills: |
| * Analysis of aqua-cultural systems inputs and outputs. * Using modern tools in determining the suitable site of aqua-farms. * Compare between alternatives in aqua-cultural systems facilities. |

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| D. General and Transferable Skills: |
| * Using computers in aqua-cultural systems design and planning. * Improve the student skills in water treatment and quality. |

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| 3. CONTENTS | | | |
| **Topic** | **No. of hours** | **Lectures** | **Practical** |
| Introduction to aqua-cultural systems | 4 | 2 | 2 |
| Site selection and water resources | 4 | 2 | 2 |
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| Water quality and environmental requirements | 4 | 2 | 2 |
| Fluid mechanics an pumps in aqua-systems | 4 | 2 | 2 |
| Aquaculture in ponds | 4 | 2 | 2 |
| Raceway an recirculating aquaculture systems; aeration and oxygenation | 4 | 2 | 2 |
| Aqua-ponics. | 4 | 2 | 2 |

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| 4. TEACHING AND LEARNING METHODS |
| 1. The main subject areas are covered in the lectures 2. Several student seminar sessions 3. Students are given a topic to research in small groups which they report as an oral presentation. 4. Collective feedback on the strengths and weaknesses of the presentations are provided. |

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| 5. STUDENT ASSESSMENT METHODS |
| ***Students will be evaluated by attendance, fulfillment and effort in exercises and presentations, and examination grades:***  1) Laboratory work: to assess the ability of students to understand and perform small laboratory experiments |

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| 6. ASSESSMENT SCHEDULE | | |
| No | AssessmentAssessment | **Week** |
| 1 | Periodical exam | 3, 7 |
| 2 | Practical exam | 12 |
| 3 | Oral exam | 13 |
| 4 | Final exam | 14 |

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| 7. WEIGHTING OF ASSESSMENT | | |
| No | AssessmentAssessment | **%** |
| 1 | Periodical exam | 15% |
| 2 | Practical exam | 15% |
| 3 | Oral exam | 10 % |
| 4 | Final exam | 60 % |
| TOTAL | | 100 % |

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| 8. LIST OF REFERENCES |
| 1. **Timmons, M. B., Ebeling, J. M, Wheaton, F. W., Summerfelt, S. T., and Vinci, B. J. 2001.** Recirculating Aquaculture systems. NRAC Publ. No. 01002, Cayuga Aqua Ventures, Ithaca, NY,   USA.<http://books.google.de/books?id=WQEXAQAAIAAJ&q=Recirculating+Aquaculture+systems&dq=Recirculating+Aquaculture+systems&hl=en&sa=X&ei=J_UAU6vrNIvU4QTftIDYCw&ved=0CDUQ6AEwAQ>   1. **Lawson, T. B. 1995.** Fundamental of Aquacultural Engineering. Elsevier Scientific Publ., Amsterdam, Netherlands.   <http://books.google.de/books?id=cXF8gzWFWEYC&printsec=frontcover&dq=Fundamental+of+Aquacultural+Engineering&hl=en&sa=X&ei=PfUAU6erCYiV4wSYl4CYDg&ved=0CC4Q6AEwAA#v=onepage&q=Fundamental%20of%20Aquacultural%20Engineering&f=false> |

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| 9. FACILITIES REQUIRED FOR TEACHING AND LEARNING |
| 1. White boards – overhead projector – data-show – stationary.. etc. 2. Teaching room/hall. 3. Computers. 4. Facilities for site visits etc., which are necessary for teaching the course. |

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| **Course Coordinators:** | **Prof. Dr. Samir A. Ali**  **Prof. Dr. El sayed Khatter** |
| **Date: / / 2015** | |