#### Course Title: Agricultural Bio-system Engineering

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| **University** | **Benha** |
| **Faculty** | **Faculty of Agriculture** |
| **COURSE SPECIFICATIONS:** |
| Program of which the course is given | Agric and Biotechnology |
| Major or Minor element of program |  |
| Departments offering the program |  |
| Department offering the course | Agric. And Biosystems Eng. |
| Academic year (level) |  |
| Date of specification approval |  |

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| **A- BASIC INFORMATION**  |
| Title  | **Agricultural Bio-system Engineering** |
| Code | **AE 1104** |
| Credit Hours  | 28 |
| Lecture | 2 Hours / week |
| Practical | 2 Hours / week  |
| Total: |  28Hours |

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| **B- PROFESSIONAL INFORMATION** |
| 1. OVERALL AIMS OF COURSE |
| Bio-systems Engineering is a field of engineering which integrates engineering science and design with applied biological, environmental and agricultural sciences. Students will be able to understand remote sensing techniques, precision agricultural, biosensors, renewable energy application in agricultural projects and developing and manufacturing products derived from biological materials |

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| 2. INTENDED LEARNING OUTCOMES OF COURSE (ILOs) |
| **A. Knowledge and Understanding:** |
| ***By the end of the course, students should:**** Understand the remote sensing, and geographical positioning system.
* Understand the role of Geographical information system in precision agriculture.
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| B. Intellectual Skills: |
| ***Successful completion of this course will allow students to:**** Deal with Biosensors, solar and geothermal energies tools
* Evaluate compost machinery and production,
* Plan for compost tea and biogas production
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| C. Professional and Practical Skills: |
| * Compost machinery and production, compost tea and biogas production parameters analysis.
* Analysis of Biosensors, solar and geothermal energies for food driers and heating buildings and green houses.
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| D. General and Transferable Skills: |
| * Analysis of geothermal energies using computers.
* Using basic knowledge of IT in greenhouse applications.
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| 3. CONTENTS |
| **Topic** | **No. of hours** | **Lectures** | **Practical** |
| 1. Introduction, remote sensing, and geographical positioning system,
 | 8 | 4 | 4 |
| 1. Geographical information system, and precision agriculture.
 | 8 | 4 | 4 |
| 1. Biosensors, solar and geothermal energies for food driers and heating buildings and green houses.
 | 8 | 4 | 4 |
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| 1. Compost machinery and production, compost tea and biogas production
 | 4 | 2 | 2 |
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| 4. TEACHING AND LEARNING METHODS |
| 1. The main subject areas are covered in the lectures (see syllabus Plan).
2. Several student seminar sessions give the opportunity for students to bring questions or discuss any aspects of the course with the tutor.
3. Students are given a topic to research in small groups which they report as an oral presentation. 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 | Assessment | **Week** |
| 1 | Periodical exam  | 3, 7 |
| 2 | Practical exam | 12 |
| 3 | Oral exam | 13 |
| 4 | Final exam | 14 |

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| 7. WEIGHING OF ASSESSMENT |
| No | Assessment | **%** |
| 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 |
| Krull, R. and Witttmann C. 2010. Biosystem engineering II: Linking cellular networks and bioprocesses. Springer, NY, USA. <http://books.google.de/books?id=G6gfnQEACAAJ&dq=Biosystem+engineering&hl=en&sa=X&ei=ou_3UrHmMoHlswbJooDYAw&redir_esc=y> Nag. A. 2009. Biosystem engineering. McGraw-Hill, NY, USA. <http://books.google.de/books?id=tgmIz2qxRKIC&q=Biosystem+engineering&dq=Biosystem+engineering&hl=en&sa=X&ei=ou_3UrHmMoHlswbJooDYAw&redir_esc=y>  |

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| 9. FACILITIES REQUIRED FOR TEACHING AND LEARNING |
| 1. Boards – overhead projector – data-show – stationary.. etc.
2. Teaching room/hall.
3. Computers.
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| **Course Coordinators:**  | **Prof. Dr. Zakaria El Haddad****Prof. Dr. Samir A. Ali** |
| **Date: / / 2015** |