#### Course Title: Genetics 1 (Fundamentals)

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| **University** | **Benha** |
| **Faculty** | **Faculty of Agriculture** |
| **COURSE SPECIFICATIONS:** | |
| Program of which the course is given | **AGRIC. BIOTECHNOLOGY PROGRAM** |
| Major or Minor element of program | Major |
| Departments offering the program | Genetics and Genetic engineering |
| Department offering the course | Genetics and Genetic engineering |
| Academic year (level) |  |
| Date of specification approval |  |

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| **A- BASIC INFORMATION** | |
| Title | Genetics 1 (Fundamentals) |
| Code | GE 1001 |
| Credit Hours | 3 |
| Lecture | 2 Hours / week |
| Practical | 2 Hours / week |
| Total: | Hours |

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| **B- PROFESSIONAL INFORMATION** |
| 1. OVERALL AIMS OF COURSE |
| * to know the student the importance of computers * to define the student the types of different computers. |

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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 difference between RAM and ROM * Understand the role of different computers in agricultural applications. |

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| B. Intellectual Skills: |
| ***Successful completion of this course will allow students to:***   * Solve the problems for the agriculture and food plant using computers. * Understand the computer attitudes. |
| C. Professional and Practical Skills: |
| * Analysis of agriculture and industrials waste using computers. * Using Microsoft word and excel applications. |
| D. General and Transferable Skills: |
| * Analysis of agriculture and industrials waste using computers. * Using Microsoft word and excel applications. |

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| 3. CONTENTS | | | |
| **Topic** | **No. of hours** | **Lectures** | **Practical** |
| Basic Mechanisms of inheritance: genetics in biology, Role of genetics in Agriculture, Industry and medicine. |  |  |  |
| Life cycles of some genetically important organisms such as viruses, bacteria, Neurospora, Drosophila, Maize, Arabidopsis and Homo sapiens. |  |  |  |
| Mendelian Genetics- Mendel's Laws of Inheritance, with specific examples from plants, Drosophila and human. |  |  |  |
| Chromosome theory of inheritance; Mendelian Genetics in Eukaryotic life cycles . |  |  |  |
| Extensions to Mendelism- dominance, co-dominance and incomplete dominance; pleiotropism; lethals and sub-lethals; |  |  |  |
| genotypic interactions epistasis, mechanism of epistasis |  |  |  |
| multiple alleles-ABO blood groups in humans,  pseudoalleles- Rh blood group incompatibility; complex loci |  |  |  |
| Mitosis and Meiosis in plants, animal and human; Chromosomal theory of heredity; Cell cycle and cell division: Chromosome segregation-mitosis, mitotic  apparatus, distribution of microtubule organizing centers, cytokinesis |  |  |  |
| Chromosome segregation-meiosis; formation and function of synaptonemal complex, crossing over and chiasmata formation; genes affecting meiosis. |  |  |  |
| Concept of sex determination and patterns in plants and animals; sex chromosomes; sex determination in flowering plants |  |  |  |
| Sex -linked, sex-limited and sex-influenced characters. |  |  |  |
| Linkage and mapping in eukaryotes;  Linkage, discovery, cytological basis of crossing over; coupling versus repulsion of syntenic alleles, the chi square test for linkage, recombination frequency and map construction, genetic mapping in a three point test cross, examples of linkage maps,  coincidence and interferenc |  |  |  |

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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 | AssessmentAssessment | **Week** |
| 1 | Periodical exam |  |
| 2 | Practical exam |  |
| 3 | Oral exam |  |
| 4 | Final exam |  |

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| 7. WEIGHING 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 |
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| 9. FACILITIES REQUIRED FOR TEACHING AND LEARNING |
| 1. Teaching aids/materials: e.g. boards – overhead projector – data-show projector – 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.**  **Prof. Dr.** |
| **Date: / / 2015** | |