#### Course Title: Plant Physiology

|  |  |
| --- | --- |
| **University** | **Benha** |
| **Faculty** | **Faculty of Agriculture** |
| **COURSE SPECIFICATIONS:** | |
| Program of which the course is given | **■obligatory for AGRICULTURAL BIOTECHNOLOGY**  **■optional for AGRIBUSINESS** |
| Type: | **■** obligatory **■** optional |
| Major or Minor element of Program |  |
| Departments offering the Program | **General course** |
| Department offering the course | **Agricultural Botany (Agricultural Botany branch)** |
| Academic year / Level | * **Second level / Second semester** **for AGRICULTURAL BIOTECHNOLOGY program** * **first level / Second semester** **for AGRIBUSINESS program** |
| Date of specification approval |  |

|  |  |
| --- | --- |
| **A- BASIC INFORMATION** | |
| Title | **Plant Physiology** |
| Code | **AB0806** |
| Credit Hours | |
| Lecture | **2 Hours / week** |
| Practical | **2 Hours / week** |
| Total: | **56 H / Semester** |

|  |
| --- |
| **B- PROFESSIONAL INFORMATION** |
| **1 – OVERALL AIMS OF COURSE** |
| The course aims for giving students the knowledge and skills of physiological activities in plant organisms. Photosynthesis, Transpiration, Water and nutrient uptake, metabolic activities and other activities are covered. |

|  |
| --- |
| **2 – Intended Learning Outcomes of Course (ILOs)** |
| **A. Knowledge and Understanding: By the end of the course, the students will be able to** |
| 1. **Define and describe basic terms in plant physiology** |
| 1. **Explain correlations between structure and function at the cell, tissue and whole plant level** |
| 1. **Describe and explain metabolism of plant cell and basic physiological processes in plants** |
| 1. **Understand the influence of endogenous and environmental signals on plant** |
| 1. **understand how plants grow, develop and sense their environment** |
| B. Intellectual Skills: |
| 1. **Analyze and compare results of experiments** |
| 1. **Conclude about the role of physiological and metabolic processes and correlations between them** |
| 1. **Discuss the concepts of assimilate translocation and partitioning in crop plants** |
| C. Professional and Practical Skills: |
| 1. **Apply practical skills in solving problems in plant physiology** |
| 1. **Achieve skills in laboratory work** |
| 1. **Learn some common methods and techniques used in plant physiology** |
| D. General and Transferable Skills: |
| **1- Work in groups with minimum supervision.** |
| **2- Use of new technologies tools of agricultural plant physiology.** |
| **3- Apply theoretical knowledge in resolving practical problems.** |
| **4-write scientific reports and proposals** |

|  |  |  |  |
| --- | --- | --- | --- |
| 3. CONTENTS | | | |
| **Topic** | **No. of hours** | **Lectures** | **Practical** |

|  |  |  |  |
| --- | --- | --- | --- |
| **4** | **4** | **8** | **Plant cell as a physiological unit.** |
| **6** | **6** | **12** | **Plant water relations: (a) osmosis, imbibition, diffusion. (b) water potential. (c) water absorption and plasmolysis. (d) cohesion, tension and transpiration. (e) transpiration and mechanisms** |
| **6** | **6** | **12** | **Photosynthesis: (a) Sites (b) Electron transport chain. (c) Photophosphorylation: Cyclic and non-cyclic (d) Biosynthetic phase (e) Calvin cycle (f) Photorespiration (g) Law of limiting factors (j) Chemosynthesis (k) Plant nutrients.** |
| **6** | **6** | **12** | **Plant growth, Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic acid and their functions. Senescence.** |
| **2** | **2** | **4** | **Photoperiodism and Vernalization** |
| **4** | **4** | **8** | **Stress physiology** |
| **28** | **28** | **56** | **Total** |

|  |
| --- |
| 4. TEACHING AND LEARNING METHODS |
| **■ Lectures ■ Laboratory practical ■ Activities ■Discussion** |

|  |
| --- |
| 5. STUDENT ASSESSMENT METHODS |
| **■ Regular exam ■Oral exam ■ Practical exam ■ Final exam.** |

|  |  |  |
| --- | --- | --- |
| 6. ASSESSMENT SCHEDULE | | |
| No | AssessmentAssessment | **Week** |
| 1 | Periodical exam | **4th, 8th and 12th Week** |
| 2 | Oral exam | **14th Week** |
| 3 | Practical exam | **15th Week** |
| 4 | Final exam | **16th Week** |

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

|  |  |
| --- | --- |
| 8. LIST OF REFERENCES | |
| **Course notes** | Make the reports fairly brief (3-4 pages may sometimes suffice) with an introduction (include hypothesis), results (tables or graphs) and discussion |
| **Essential books (text books)** | -Hopkines,W.G. and Norman ,P.A.(2008): Introduction to plant physiology, (4th Edition), John Wiley andSons, Inc.  - Gill, p.s.(2000). Plant physiology, S. Chand &Co Ltd, ISBN 8121917948, 9788121917940, New Delhi.  - Öpik, H. and Stephen, A. R. (2005). The Physiology of Flowering Plants, (4th Edition) edition, Cambridge University Press, Online ISBN:9781139164450, Hardback ISBN:9780521662512, Paperback ISBN:9780521664851.  -Verma, S.K and Mohit, V. ( 2008). A text book of plant physiology, Biochemistary and biotechnology. S. chand &Company LTD. Ramnagar New Delhi- 110055.  -[William, V. D.](http://www.amazon.com/s/ref=ntt_athr_dp_sr_1?_encoding=UTF8&field-author=William%20V%20Dashek&search-alias=books&sort=relevancerank) and  [Marcia, H.](http://www.amazon.com/s/ref=ntt_athr_dp_sr_2?_encoding=UTF8&field-author=Marcia%20Harrison&search-alias=books&sort=relevancerank) (2010): Plant Cell Biology, Science Publishers; 1 edition , ISBN-13: 978-1578083763, Enfield, NH, USA . |
| **Recommended books** | - Taiz, L. and Zeiger, E. (2010): Plant Physiology. 5th ed. Sinauer Associates, Inc. Publishers, Sunderland, MA ISBN: 978-0-87893-866-7. |
| **- Periodicals, Web sites, etc.** | Literature sources available on Internet – for example: plant physiology Online  www.Google.com (search key cell biology) [www.publish.csiro.au/journals/ajsr](http://www.publish.csiro.au/journals/ajsr) www.amazon.com |

|  |
| --- |
| 9. FACILITIES REQUIRED FOR TEACHING AND LEARNING |
| **Teaching class – Laboratory – Data show – Boards – plant samples –Microscopes – Computer-Glasses- Chemicals.** |

|  |  |
| --- | --- |
| **Course Coordinators:** | **Prof. Dr. Hosny Mohamed Abd El-Dayem** |
| **Head of Department:** | **Prof. Dr. Hosny Mohamed Abd El-Dayem** |
| **Date: / / 2015** | |