FACULTY OF AGRICLTURE – MANSOURA UNIVERSITY

In Collaboration With Life Science Copenhagen University, Denmark
Faculty of Horticulture, life Science University, Poland
and Faculties of Agriculture Alexandria , Ain Shams and El-Minia Universities, Egypt

Curriculum of Master Programme IN Establishing a New MASTER DEGREE IN SEED SCIENCES

(European Credit Transfer System)

ECTS

TEMPUS CD - JEP - Project

No. 33014 EG 2005

2008








Mansoura University

Faculty of Agriculture

Internal proposal for

Establishing A New Master Degree

in

Seed Sciences

Using European Credit Transfer system

(ECTS)

2008

REGULATIONS AND CURRICULA
FOR
ADMISSION TO MASTER PROGRAM IN
SEED SCIENCES
EUROPEAN CREDIT TRANSFER SYSTEM (ECTS)

FACULTY OF AGRICULTURE, MANSOURA UNIVERSITY

This Master Programme initiated by the

CD-JEP-TEMPUS Project 33014-EG-2005

Project Title: ESTABLISHING A NEW MASTER DEGREE IN SEED SCIENCES.
Project Acronym: ENEWMASS
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A proposal for Establishing A New Master Degree in Seed Sciences Using European Credit Transfer System (ECTS)

Introduction :

The suggested proposal of the new programme is primarily designed to renew and reform the higher education in the field of seed science. The pivotal outcome of the project is to establish a new Master Degree programme for post-graduates in seed sciences at Mansoura University in collaboration with international universities and four Egyptian universities: Mansoura, Ain-Shams, Alexandria and El-Mina. The programme focuses on improving seed production and quality for economically important crops and protects plants and seeds from diseases. Ultimately, the programme will contribute to increasing the national income in addition to suggesting a new model for pursuing Master Degree in the faculty based on the European credit transfer system (ECTS).

Goals of the programme :

This programme aims to

1. Establish a new course for Postgraduate students enrolled in Master Degree of Seed Sciences at Mansoura University and other universities participating in the TEMPUS project.
2. Develop two web-based modules in order to deliver two online courses relating to the specialisations of the MSc programme.
3. Design courses that meet international standards to support student mobility and to create an opportunity to apply new teaching methodologies and up-to-date learning materials.
4. Share experience with universities abroad and exchange information or knowledge of topics concerning curriculum development for local higher education.
5. Raise awareness concerning growing economically important crops with high productivity and good seed quality. This will raise the national income, and improve qualification of graduates to work in the agriculture sector.
6. Increase the cooperation between universities, agricultural research centres and the Ministry of Agriculture in Egypt.
7. According to Bologna Process entails system of accumulation and Transfer of Credits (ECTS). By unifying this system with European countries; it will be implemented as a system of academic grades, which are easy to compare, facilitating mobility and international recognition. The new master degree program will follow the European credit transfer system (ECTS). It also include the interaction of the Master degree that corresponds to EU standards of higher education; since many Egyptian get their Master and Ph.D. from many of the EU countries and there are several other TEMPUS projects; private universities and institutes working in Egypt adopt ECTS; This project can be also an added value to the higher education system in Egypt.

General Framework :

The general framework consists of the following

1. Upgrading the previous approaches of teaching and learning in the field of seed sciences and technology and seed pathology.
2. Reforming and improving the current courses.
3. Using the technology of electronic learning and teaching and making advantages of modern equipment in teaching. The following chart illustrates the framework of the programme.

Components of the Programme :

There are two major components

1) Seed production and technology.
2) Seed pathology.

The preparation of the above courses will include the use of modern teaching methods such as information technology and multimedia.

Internal regulation for
The New Master Degree in Seed Sciences
Using European Credit Transfer System (ECTS)

Chapter One

Goals of the New Master Degree of Seed Sciences

The Goals of Establishing Master Degree in Seed Sciences .

1. There is a trend to increase the productivity of the area of cultivated lands. This increase will not continue unless new cropping methods are implemented; better varieties are developed and seeds with higher quality are used. At the present time the use of certified economically important seeds amounts to 0.05-45%, depending on crop. Through this new Master Degree the national awareness will be elevated or raised to concerning the use of certified seeds which result in increasing productivity of the cultivated areas as well as the national income.
2. Promoting the competences and skills of graduates who will work in the agricultural industry.
3. Supplying the labour market with graduates who are proficient in this field, for example, the Ministry of Agriculture and Seed Companies.

Implementation of Goals:

1. Much attention will be paid to develop or improve courses which assist graduates to compete in the labour market and enable them to find decent jobs in the of seed production companies and research centres in order to increase production and improve quality the production of crops in the field and the agricultural and food industries.
2. Preparing the students to keep abreast with recent developments in the field of seed production technology and seed pathology. Students will receive extensive training in seed science and technology in the proposed courses.
3. Taking advantages of the experiences from European universities which participate in the development of the new courses and programmes.
4. Training postgraduate students and staff members from Egyptian partner universities.
5. Staff member from European partner universities will teach postgraduate students in Egyptian partner universities during the project implementation.

Application of the ECTS System:

a. Mansoura University and other partner universities enact a new master degree for students at Faculty of Agriculture Mansoura University called "Establishment of New Master Degree in Seed Sciences based on the ECTS system". The degree programme will be developed at the Agronomy Departments at the different partner universities. The degree will be in the field of Seed Sciences and encompass specialisations in Seed Technology.

b. ECTS credits are a value allocated to course units to describe the student workload required to complete them. They reflect the quantity of work each course requires in relation to the total quantity of work necessary to complete a full year academic study at the institution; that is, lectures, practical work, seminars, private work and examinations or other assessment activities. ECTS credits express a relative value. In ECTS, 60 credits represent the workload for a full-time academic year; normally 30 credits are given for a semester.

ECTS student master workload and transition between systems:

Mansoura University grants a new Master Degree in Seed Sciences (encompassing two specialisations in Seed Technology and Seed Pathology) upon the request of the council of the Faculty of Agriculture. It is based upon the European credit transfer system (ECTS) on the condition that the student passes or takes the following credit hours.

1. Seventy four (74) ECTS compulsory credit transfer points.
2. Sixteen (16) ECTS selective credit transfer points.
3. Submit and defend a master thesis in the field of technology seed production and seed pathology (30 ECTS credit transfer system).
4. CTS students and transition between systems study M.Sc. student from the conventional programme can make a request to the department and faculty boards to join and study the ECTS courses as external student outside this programme and follows the regulation of the conventional system. Also, he/she has the right to keep his/her course credits of the new system.

Chapter Two
Conditions and Enrolment

Admission to the MSc in Seed Sciences presupposes a BSc within the field of Agricultural Sciences. Applicants with other educational backgrounds, and everyone seeking admission on the basis of foreign qualifications, must be able to document (1) educational prerequisites corresponding to BSc level and (2) basic subject-related knowledge with respect to statistics and science theory.

1-Conditions of Enrolment:

1) Conditions:

1. Holders of certificates from faculties of agriculture in Egypt and foreign Universities are eligible to register for the MSc education follow the European credit transfer system (ECTS) after the authorization of Higher Council of Universities.
2. Graduates who hold a BSc grade "Good" at least are eligible to enrol for the higher studies or hold diploma degree with grade good at least.
3. Registration expenses and compensation for educational services are to be paid at the beginning of registration, in addition to the compensation for educational services for each study course at the start of semester. Mansoura University Council determines the required registration expenses and compensation for educational services according to regulation.

2) Enrolment

1. The duration of the study in the programme is two academic years (corresponding to 120 ECTS). The study has to be finished within 2 years from the registration date.
2. First Semester starts on 3rd Saturday of September for 15 teaching weeks.
3. Second semester starts on the end of Saturday of February for 15 teaching weeks.
4. Summer course starts 1st Saturday of July for 6 teaching weeks.
5. The students should complete the procedures of registration and enrolment two weeks before the beginning of study.
6. Registration for the first time should be completed in September or February of annually.
7. Academic advisors from the faculty staff will be assigned by the faculty council as suggested by the administration office of the project.
8. Students who want to take the programme between Egyptian universities need to decide early in their studies since additional tuition needs to be taken after the project has finished.
9. If any fees or charges are still unpaid when due, the degree will not be conferred, and no certificate in respect of the award will be issued, until the debt has been paid in full.
10. Postgraduates must inform their advisors if they are absent from College for more than one week during term. If the absence is due to illness, a medical certificate must be presented. If an examination is missed because of illness (or of the student's maternity) a medical certificate must be produced immediately.
11. Students must notify the college of any change in their home address.

3)Studies Undertaken Outside the University

1. Any student may be permitted by a vice-dean of postgraduate studies, on the recommendation of the relevant supervisory team, to take courses in participating universities in the same Master programme provided. However, identical or similar courses cannot be repeated at other consortium Egyptian universities**.**
2. The vice-dean of postgraduate studies approves the study plan before the beginning of the period of study that:
   a. The student will have access to adequate facilities and resources; sufficient time for study and research will be available to the student;
   b. Appropriate arrangements will be made for student supervision during study periods outside the University, including arrangements for the supervisory team to maintain contact with student and meeting them as often as is necessary;
   c. Appropriate arrangements have to be made in any case with the institution where the student works at another inside Egyptian universities partners and is offered local supervision and support by the staff at that institution.

Chapter Three
Concepts, Restrictions and Examinations

(1) Conditions of Registration, Modification and Cancelling:

1. Students must register for 60 ECTS in the first year.
2. Students are allowed to register up to 25 ECTS in the first and the second semester.
3. Students have the right to change or replace a course with another except during the summer session.
4. Students have the right to withdraw from a course within eight days from the beginning of study during the first and second semesters and within 3 weeks maximum during the summer session.
5. Students have the right to re-register any course he/she has failed once.
6. The total length of study programme is 120 ECTS at two years unless there are coercive circumstances, *e.g.*, maternity leave.

(2) Examinations and results:

7. **The maximum mark for all courses is 100%**. The criteria of evaluation are as follows:

Oral Activities	Project work	Practical work	Final written exam	Total
10%	10%	20%	60%	100

8. **The time allotted to the final examinations** and lab work is two hours for each. Oral exams will be conducted within the last week of the semester, whereas the running assessment takes place during the semester upon the approval of the academic advisor, according individual courses.

(3) General Grading Policy:

Details regarding the assessment of each individual course are given in the ECTS syllabus of the course. The table below shows the general grading policy.

Letter Grade	Numerical Grade
A	90-100
B	65-90
C	35-65
D	10-35
E	0-10
FX	51-55
F	> 50

(4) Recommended Grading Policy:

The recommended Policy of the Faculty with respect to examinations and evaluation is as follows:

Final Examination	40-60%
Term Paper or Projects	25-40%
Running assessment *	0-20%

*Running assessment includes activities such as laboratory & field trip reports, tests in class, No points are given for attendance.

(5) Thesis regulations:

1. Students are admitted to the master's thesis when they have completed at least 90 ECTS points.
2. Courses can be taken in parallel to the thesis research if deemed appropriate.
3. The topic of the master's thesis is assigned to the student by a professor at the beginning of registration.
4. The time period for the master's thesis is at least 6 months corresponding to an effort of 30 ECTS. The request has to be approved by the supervisor and the board of examiners.
5. The student shall submit 4 copies of the thesis to the board of examiners. When submitting the thesis, the student shall add a signed statement, declaring that the submitted thesis is his/her own work, that all major sources have been appropriately referenced and that the submitted thesis has not been submitted in substantially the same form towards the award of another degree or other qualifying work by the candidate or any other person.
6. The master's thesis shall be written in English. In this case, an Arabic summary is required.
7. The master's thesis and its presentation are worth 30 ECTS. The thesis shall be examined and evaluated within 6 weeks by at least two external examiners.

(6) The academic advisors and supervisors:

The administrator of the project nominates an academic advisor for each student. The main task of the academic advisor is to guide the student during the study and help the student to select the courses necessary for his/her field of study. The student can consult the academic advisor during the study. The advisor's opinion should not be imposed on the student until the advising committee is formed. It is preferable that the academic advisor be a member of that committee. Only professors and assistant professors can be responsible academic advisors. The MSc project has at least one supervisor. The number of advising committee should not exceed three members, one of them is nominated as the major or chairman of the committee (senior member). The research work for the thesis can be carried out in whole or in part in a seed company or research organization provided that the supervisation is an chord with the responsible supervisor at the university of registration. In this case an external supervisor must participate in directing the student in his/her thesis. In addition ,the external supervisor must be in the level of associate professor at least.

(7) Examinations:

1. If a student fails a performance evaluation or any other examination, the board of examiners will notify the student and inform him/her about the deadlines for re-examination. If a student does not pass a re-examination, the examination has been definitively failed. If a student definitively fails a performance evaluation, the master's thesis or its oral presentation, he definitively failed the master's degree and will be excluded from the university. Re-examination of performance evaluation exams pertaining to modules of 30 ECTS may be repeated or tried attempted twice. A third attempt is not possible. Papers, assignments, reports and the master's thesis can only be repeated once.
2. One key course of the General area and one specialized advanced course in the area of "Seed Production and Technology" or "Seed Pathology" can be re-attempted to improve the grade or can be replaced with the grade from a similar course. The re-examination for improving the grade

shall occur at the first examination date following the first exam. No exam can be taken more than twice. The best grade will be taken into account.

3. In collaboration with their advisors, a student can modify their study plan to replace failed courses with new courses.

(8) Examining committee:

An academic committee should be formed from the members of the supervisory committee to examine the thesis and issue its eligibility. One or two external examiners should be invited to the oral defence.

1. An academic committee should be formed from the members of the supervisory committee and two external examiners to examine orally the candidate's thesis. The external examiners should be specialized in seed sciences. The Departmental Council should approve the examining committee which will be raised to the Faculty Council and finally approved by the Vice-President of the University for Higher Studies and Research.
2. The chairman of the supervisory committee submits the thesis to the examination committee. Then he receives their separate reports and determines the date of the oral defence no later than six weeks after it has been submitted to the Vice – President of University for Higher Studies and Research. The committee is entitled to return the thesis to the candidate to make any necessary changes as recommended within six months. In this case, this period will not be considered or calculated from the maximum four years period. To grant the candidate the majority of committee should agree on it. The chairman of the supervisory committee submits the individual and the collective reports to the Department Council responsible for the programme. All the documents should be submitted to the committee of Higher Studies and Research, then to the Faculty Council as a prerequisite to be finally presented to the University Council to grant the degree.

Chapter Four
Programme Structure

Structure of the programme:

To obtain the MSc degree in seed sciences, the student should pass all courses of the European credit transfer system (ECTS) grading scale. It is not intended that all courses (or indeed both specialisations) should be available from all participating institutions.

A. The programme consists of:

1. The programme comprises 120 ECTS credits, corresponding to 2 years and leads to a Master of Science in Seed Sciences with specialisations in Seed Technology or Seed Pathology
2. The programme consists of compulsory courses and elective courses corresponding to 90 ECTS credits and MSc thesis 30 ECTS credits to obtain Master degree in research hep students to complete the Ph D degree registration. Details are regulated in the degree's course scheme (Study Catalogue).
3. A diploma degree of Seed Sciences can be awarded to student who have obtained 60 ECTS, but do not tend to continue to an MSc thesis and they can acquire after summer training.
4. Alternatively, a professional master can be awarded to students who have obtained 90 ECTS and they can also be acquired after the summer school following the submission of a review paper (term paper) that equal 10 ECTS.

B. General and Supporting Courses:

1. These courses can be used either to add depth to scientific and technical knowledge related to the chosen specialization area or to add breadth to the range of acquired skills with those in other disciplines, such as seed biology; physiology and entomology.

2. Tutors will support the students in making valuable choices of multidisciplinary courses. These may be selected from the complete course catalogue of Mansoura and Egyptian consortium universities.
3. Master programs require a minimum of 60 ECTS from the general courses and 30 cp ECTS from the specialist courses.

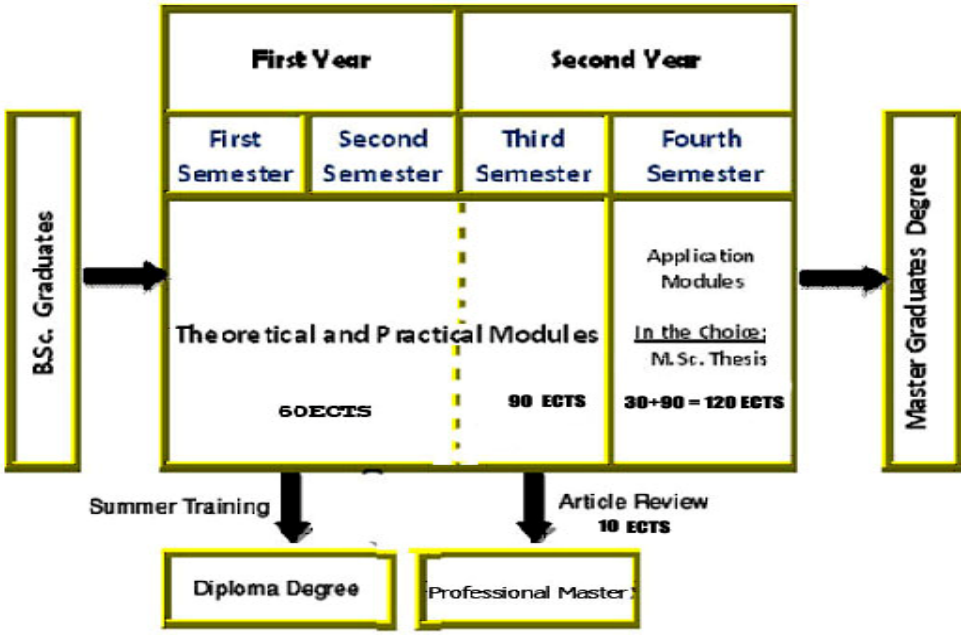
C. Specialization courses

1. These courses lay the foundation of the Master program by providing the students with core knowledge in the respective area of specialization. Tutors define the core courses with varying degree of constraint. In some cases, compulsory courses are specified equivalent 30 ECTS. In others, all of the core courses must be chosen from a predetermined list of electives of each semester. In all cases, tutors always pay special attention to accommodate the expectations and talents of each student. Our Master programmes require a minimum of 30 ECTS from the core courses.
2. Our Master program comprises several courses, an internships, and project-work. The corresponding credit points can only be awarded at the completion of each prescribed assessment.
3. Successful graduates of the master degree programme are awarded the academic degree "Master of Science" ("M.Sc.").
4. Specification of Courses: This programme consists of:

A) Seed Production and technology.

B) Seed Pathology.

The student should select one of the above courses. The distribution of those courses is diagrammed as follows:



Programme Structure

The Outline of academic program and semester structure of

Master Degree curricula In Seed Sciences

Semester	General Modules (Introductory Courses)					ECTS
1st semester		Code	Course name	h/w	ECTS	
	Compulsory Courses	1101	English Language I	2	2	22
		1102	Structure of Propagation Materials	4	5	
		1103	Seed Physiology	4	5	
		1104	Seed Production of self pollinated crops	4	5	
		1105	Plant Pathology	4	5	
	Elective Courses (2 taken)	1106	Propagation of Range-Land Plants	4	4	8
		1107	Plant Genetic Resources	4	4	
		1108	Seed Production of Vegetables and Aromatic Plants	4	4	
		1109	Propagation and production of ornamental plants	4	4	
	Advanced Modules (Seed Science and Multidisciplinary Courses)					30
2nd Semester		Code	Course name	h/w	ECTS	
	Compulsory Courses	1110	Applied Information Technology	2	2	22
		1111	Seed testing	4	4	
		1112	Advanced Plant Breeding	4	4	
		1113	Seed Processing	4	4	
		1114	Seed Production of Cross-Pollinated Crops	4	4	
		1115	Advanced design and Analysis of Experiments	4	4	
	Elective Courses (2 taken)	1116	English Language II	2	2	8
		1117	Plant Protection	2	2	
		1118	Seed Borne Diseases	4	4	
		1119	Seed Ecology	4	4	
	SPECIALIST COURSES					30
		Code	Course name	h/w	ECTS	
3rd Semester	Seed Technology Courses (Compulsory)	1120	Research Methods and Thesis Writing	3	4	30
			World Seed Market	3	4	
		1121	Seed Industry	4	5	
		1122	Seed Storage	5	6	
		1123	Industrial Use of Seeds	4	5	
		1124	Plant Biotechnology	5	6	
		1125				
	Seed Pathology Courses (Compulsory)	1120	Research Methods and Thesis Writing	3	4	30
		1125	Plant Biotechnology	5	6	
		1126	Seed Borne Fungi	4	5	
		1127	Seed Borne Viruses	4	5	
		1128	Seed Borne Bacteria	4	5	
		1129	Transmission and Control of Seed Borne diseases and pests	4	5	
4th Semester	Master Thesis					30
	Total					120

Courses of the first year

First semester: The student selects a number of courses equivalents to 30 European credit hour system (ECTS) from the following courses which last for 15 weeks.

1- **Compulsory courses:** Students study 22 European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1101	English language I	1	1	-	2	2
1102	Structure of Propagation Materials	2	2	1	5	2
1103	Seed physiology	2	2	1	5	2
1104	Seed production of self pollinated crops	2	2	1	5	2
1105	Plant pathology	2	2	1	5	2
	Total compulsory ECTS	22				

2-Selective courses: Students study 8European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1106	Propagation of Range-Land Plants	2	2	-	4	2
1107	Plant Genetic Resources	2	1	1	4	2
1108	Seed Production of Vegetables and Aromatic Plants	2	1	1	4	2
1109	Propagation and production of ornamental plants	2	1	1	4	2
	Total Selective courses	8				

Second semester: The student selects a number of courses equivalents to 30 European credit transfer system (ECTS) from the following courses which last for 15 weeks.

1-Compulsory courses: Students study 22 European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1110	Applied Information Technology	1	1	-	2	2
1111	Seed testing	2	2	-	4	2
1112	Advanced Plant Breeding	2	2	-	4	2
1113	Seed processing	2	1	1	4	2
1114	Seed propagation of cross pollinated crops	2	1	1	4	2
1115	Advanced Design and analysis of experiments	2	1	1	4	2
	Total compulsory ECTS	22				

2-Selective courses: Students study 8 European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1116	English Language II	1	1	-	2	2
1117	Plant protection	1	1	-	2	2
1118	Seed borne diseases	2	1	1	4	2
1119	Seed Ecology	2	1	1	4	2
	Total Selective courses	8				

Courses of the second year

B.First Group Courses Seed Production and Technology:

The courses are divided into two groups. If the candidate wants to obtain the Master of Science thesis in seed production and technology, he/she selects the courses displayed in the first group . The student studying seed production and technology selects a number equivalent to 30 European credit hour system (ECTS) from the following courses which last for 15 weeks.

A. Compulsory courses only in this group: Students study 30 European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1120	Research Methods and Thesis Writing	2	1	1	4	2
1121	World Seed Market	2	1	1	4	2
1122	Seed Industry	2	2	1	5	2
1123	Seed Storage	2	2	2	6	2
1124	Industrial Use of Seeds	2	2	1	5	2
1125	Plant Biotechnology	2	2	2	6	2
	Total Compulsory courses	30				

If the candidate wants to write a Master of Science thesis in seed pathology, he/she selects the courses in the second group. Students studying seed pathology select a number equivalent to 30 European credit transfer (ECTS) from the following courses which last for 15 weeks.

B. Second Group Courses Seed Pathology.

Compulsory courses only in this group: Students study 30 European credit transfer system (ECTS) as follows:

Course Code	Courses	European credit transfer system (ECTS)				No. of examination hours
		Theoretical	Practical	Activities	Total	
1120	**Research Methods and Thesis Writing**	2	1	1	4	2
1125	**Plant Biotechnology(a)**	2	2	2	6	2
1126	**Seed Borne Fungi**	2	2	1	5	2
1127	**Seed Borne Viruses**	2	2	1	5	2
1128	**Seed Borne Bacteria**	2	2	1	5	2
1129	**Transmission and Control of Seed Borne diseases and pests**	2	2	1	5	2
	Total Compulsory courses	30				

Chapter Five
Course Descriptions

Module title	**English Language I**			
Module code	1101	Semester : 1	ECTS : 2	Compulsory Course
Leader				
Other staff				
Prerequisites	-			
Concurrent	-			
Postrequisite	English II and Applied information technology			
Availability	Textbooks on Library reserves and other references, website			
Aims	The aim of this course is to train students in reading and writing texts and using agriculture vocabulary in English. To develop students skills in structures of English sentences especially scientific applicable. Increase students vocabulary related to agricultural field.			
Objectives	Train students in couching materials and classifying literature in a scientific way.			

Teaching methods	Number of hours / semester
Lectures	24h
Seminars	12h
Tutorials	12h
Practicals	12h
Field visit	-
Private study	-
Other	
Total	60 h
Outline syllabus	

1- Teaching methods of reading texts in English.
2- Writing skills English
3- Structure of English sentences (Grammar)
4- An application of some scientific agricultural topics.
5- Developing student oral skills.
6- Conversation skills Dialogues

Literature

1) Blanchard K. and Root C.(1996). For your information Intermediate Reading Skills . Longman press.
2) Muntford A. (1985) .English Agriculture. Oxford University Press

Tentative Timetable:

First week: For your information - English for agriculture (unit1) – Fundamentals of English grammar: Present time
Second week: For your information (unit1) English for agriculture (unit2) – fundamentals of English grammar: present time
Third Week: For your information (unit2) – English for agriculture (unit3) – fundamentals of English grammar: past time
Fourth Week: For your information (unit2 "cont") – English for agriculture (unit4) – fundamentals of English grammar: the past time
Fifth Week : For your information (unit3) – English for agriculture (unit5) – fundamentals of English grammar: future time
Six Week : For your information (unit3 "cont.") – English for agriculture (unit6) – fundamentals of English grammar: future time "cont"
Seventh Week: Mid Term Exam and For your information (unit4) – English for agriculture (unit7) – fundamentals of English grammar: asking question.
Eight weeks: For your information (unit4 "cont.") – English for agriculture (unit8) – fundamentals of English grammar: asking question
Nine Week : For your information (unit5) – English for agriculture (unit9) – fundamentals of English grammar: nouns pronouns
Ten Week: For your information (unit5 "cont.") – English for agriculture (unit10) – fundamentals of English grammar: nouns pronouns
Eleven Week: For your information (unit6) – English for agriculture (unit11) – fundamentals of English grammar: modal auxiliaries
Twelve Week: For your information (unit6 "cont") – English for agriculture (unit12) – fundamentals of English grammar: modal auxiliaries
Thirteen Week: For your information (unit7) – English for agriculture (unit13) – fundamentals of English grammar: connecting ideas "cont."
Fourteen Week: Oral and practical Exam
Fifteen Week: Final exam

Module title	**Structure of Propagation Materials**			
Module code	1102	Semester : 1	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	Non			
Postrequisite	1106- propagation of range land plants and 1112- Advanced plant breeding			
Availability	Micro technique Lab, textbook course website, and green house			

Aims	The course aims to increase student ability to identify seed of crops and weeds. To gain an introduction in methods of propagation. To learn fundamentals of vegetative propagation processes under standing of principles of conventional vegetative propagation
Objectives	The objective of this course is to teach student the important of seed structure as a tool for seed identification To search the morphology of seed, development and maturation stages the student will given the required information to identify seed morphological structure and detail their development

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	24h
Tutorials	12h
Practicals	48h
Field visit(Green House)	12h
Private study	6h
Other	-
Total	150 h

Outline syllabus

1. Botanical origin and definition of seed.
2. The anatomy and development of seeds.
3. General plant anatomy.
4. Vegetative propagation.
5. Principals and methods of identification.
6. Morphological identification of important crops and weed seed.
7. General methods for identifying seed species.
8. Chemical content and storage materials of seed (protein, starch, lipids).

Literature

1) Desai, B.B. (2004). Seeds handbook.
2) Koo, B.(2004). Saving Seeds.

Tentative Timetable

First week: Flower bud initiation and flower characteristics
Second week: Male and female gametogenensis
Third Week: Pollination and fertilization
Fourth Week: Seed formation and embryogenesis
Fifth Week : Morphological and anatomical **of seeds**
Six Week : Features of the developing seeding
Seventh Week: Mid term Exam
Eight weeks: General methods for indentifying
Nine Week : Different types of seeds general structure of reproductive organ**s**
Ten Week: General structure of reproductive vegetative organ i.e stems, roots leaves, tubers, corms, rhizomes and buds .Reserve materials in the reproductive organs
Eleven Week: Some of the techniques involved in plant propagation
Twelve Week: Storage of the reproductive organs and longevity
Thirteen Week: Morphological identification of important crops and weed seed - General methods for identifying seed species
Fourteen Week: Oral and practical Exam
Fifteen Week: Final exam

Module title	**Seed physiology**			
Module code	1103	Semester : 1	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	Non			
Postrequisite	1111- Seed testing and 1113- Seed processing			
Availability	Textbook, Seed Lab and course Website			
Aims	Provide knowledge of seed development and physiology. Understand the importance of the physiological state of the seed on viability and germination.			
Objectives	Student will be able to gain a greater under standing of seed physiology in field crops. To be describe the physiological processes as represented by mobilization of reserve material in the seeds			

Teaching methods	Number of hours / semester
Lectures	48 h
Seminars	24 h
Tutorials	12 h
Practicals	48 h
Field visit	-
Private study	12 h
Other	6h
Total	150 h

Outline syllabus

Physiological aspects of seed development (*e.g.*, hormones), maturation and longevity.
Studying the nature and role of environmental factors which limit the physiological processes.
Considerations of quality differences associated with whether the seed will be used directly as an industrial material or whether the seed will be sown.
Topics include:

1. Embryogenesis (Seed formation)
2. Chemical composition of seeds (Seed resave material) cereals, legumes, oil aromatic.
3. Hormonal regulation of physiological processes.
4. Germination and modelling techniques (growth curves).
5. Viability and deterioration.
6. Mechanisms regulating dormancy.
7. Environmental stress factors *e.g.*, dehydration tolerance (drought), temperature, (Hydrothermal time models)
8. Seed respiration

Literature

1) Nicolas, G. (2003). The Biology of seeds.

Tentative Timetable

First week: Overview (General tends in angiosperm seed evolution)
Second week: Embryogenesis (Seed formation)
Third Week: Chemical composition seed resave material of legume.
Fourth Week: Chemical composition seed resave material of oil crops
Fifth Week : Chemical composition seed resave material of cereals crops
Six Week : Chemical composition of aromatic seeds

Seventh Week: Midterm exam
Eight weeks: Dormancy and its relation to germination
Nine Week : Variation of the seed dormancy and hormonal regulation
Ten Week: Seed viability and deterioration
Eleven Week: Environmental stress factors
Twelve Week: Mechanical seed enhancements
Thirteen Week: Seed respiration
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Seed Production of Self Pollinated crops**			
Module code	1104	Semester : 1	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	Non			
Postrequisite	1114- Seed Production of Cross- Pollinated crops + 1112- Advanced Plant Breeding			
Availability	Textbooks, Website course, Field visit, other references and seed company			
Aims	To learn the methods of production of self- pollinated crops. Differentiation between agricultural and methods of production of highly productive cultivars. To provide students basic principles in the genetic improvement of cultivars in self pollinated crop species.			
Objectives	Students should be able to give advice about the production of self-pollinated crops. The student will be able to apply concepts of plant growth and development to the production of self pollinated crops. To help student learn and able to review and assess current research literature related to seed production of self pollinated crops.			

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	24h
Tutorials	6h
Practicals	48h
Field visit	12h
Private study	12h
Other	-
Total	150 h

Outline syllabus

1. Distribution of self pollinated crops in the world and Egypt
2. Development stages of studied crops
3. The environmental conditions affecting production of self pollinated crops
4. Agronomic practices for cereal production *e.g.*, wheat, and barley
5. Agronomic practices for legume production *e.g.* rice and flax
6. Methods of plant breeding of self pollinated crops for new cultivar production.

Literature

1) Agrawal,R.L. (1998).Fundamentals of plant breeding and Hybrid seed production. Science Pub. Inc. New Hampshire.
2) Sinclair, T.R. and F.P. Gardner (1997) principles of Ecology in plant production, CAB international, G.K.

Tentative Timetable:

First week: General approach
Second week: World distribution of some self pollinated crops
Third Week: Developmental stages of some self pollinated crops
Fourth Week: Developmental stages of some self pollinated crops
Fifth Week : Midterm exam
Six Week: Environmental conditions affecting production of wheat and barley.
Seventh Week: Environmental conditions affecting production of wheat and barley
Eight weeks: Environmental conditions affecting production of wheat and barley rice and flax
Nine Week : Agronomic practise for self pollinated crops production (wheat and barley)
Ten Week: Agronomic practise for self pollinated crops production(rice and Flax)
Eleven Week: Methods of plant breeding of self pollinated crops of new rice cultivars
Twelve Weeks: Methods of plant breeding of self pollinated crops of new barley cultivars.
Thirteen Week: Methods of plant breeding of self pollinated crops of new flax cultivars
Fourteen Weeks: Oral and practical.
Fifteen Week: Final exam

Module title	**Plant Pathology**			
Module code	1105	Semester : 1	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites				
Concurrent				
Postrequisite	1117- Plant Protection			
Availability	Pathology Lab, textbook, website course			
Aims	Aims are to introduce the main types of plant diseases and the biology of the organisms causing diseases			
Objectives	The objective of this course is to teach student principles of plant pathology in relation to plant and seed borne disease and how to avoid and control them. This specialty will develop basic knowledge in plant pathology situated in their ecological, technical and human contexts, as techno scientific procedures exploiting human beings' characteristics for production purposes.			

Teaching methods	Number of hours/semester
Lectures	36 h
Seminars	24 h
Tutorials	7h
Practicals	48h
Field visit	14h
Private study	16h
Other	5h
Total	150 h/w

Outline syllabus

1. Introduction to plant pathogenic micro-organisms and their taxonomy
2. Introduction to the concepts symptom logy and diagnosis
3. Introduction to Infection processes, pathogen city,
4. Ways of pathogen inoculums spread and dispersal of pathogens.
5. Pathogen reproduction and survival between seasons.
6. Disease resistance and plant defence mechanisms.
7. Introduction to plant disease control measures (disease management)
8. Examples of post harvest diseases
9. Case studies of economic plant diseases in agriculture and horticulture.
10. A biotic plant diseases

Literature

1- Agrios , G.N. (2005). *Plant pathology*, Amsterdam Elsevier, 922 pages. Is verbose and is biased to North American conditions, but does have excellent illustrations.
2- Thind, T.S. (2001). Diseases of fruits and vegetables and their management . Kalyani Publishers.474P.
3- Lucas, J.A. (1998). Plant Pathology and Plant Pathogens. Blackwell Science. 274 pp.

Tentative Timetable

First week: Introduction to Plant Pathology
Second week: Taxonomy of Plant Pathogens
Third Week: Dispersal of pathogens, inoculums survival and disease Development
Fourth Week: Symptomology and diagnosis
Fifth Week : Disease resistance and plant defence mechanisms
Six Week : Midterm Exam
Seventh Week: Midterm exam
Eight weeks: Plant disease control measures (I)
Nine Week : Plant disease control measures (II)
Ten Week: Case studies of economic diseases of field crops (I)
Eleven Week: Case studies of economic diseases of field crops (II)
Twelve Week: Case studies of economic diseases of Horticulture crops
Thirteen Week: Case studies of economic diseases of post harvest diseases
Fourteen Week: Oral and practical Exam
Fifteen Week: Final exam

Module title	**Propagation of range-land plants**			
Module code	1106	Semester : 2	ECTS : 4	Elective Course
Leader				
Other staff				
Prerequisites	-			
Concurrent	1107- Plant genetic resources			
Postrequisite	1114- Seed production of cross pollinated crops			
Availability	Range-land Trip, textbook, website course, references and green house			
Aims	This course aims to improve students' skills and knowledge of methods for vegetative and seed propagation of range-land plants (pasture) and their effect in crop productivity. To learn students principles and practices required to produce high quality seed of rang land plants			
Objectives	Give students skills and knowledge about methods of vegetative and seed range propagation.			

	To understand how management practices and the environment effects, productivity, development and seed production of range land plants.

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	12h
Tutorials	-
Practicals	24h
Field visit	24h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1- Fundamental principles underlying sexual and asexual propagation of plants.
2- Methods of sexual propagation.
3- Methods of vegetative parts propagation.
4- Vegetative propagation and its relation to keeping genetic purity .
5- Factors affecting range plant growth (Biotic and a biotic)

Literature

1) Rios , S.R. (2001) Tropical Forage Plants. CRC Press USA.
2) Hartmann, H. T. and D. E. Kestor. (1996). Plant Propagation : Principles and Practices – Prentice Hall Inc. , New Jersey.

Tentative Timetable

First week: Introduction to plant reproduction.
Second week: Methods of sexual propagation (by seed)
Third Week: Methods of a sexual propagation
Fourth Week: Methods of a sexual propagation
Fifth Week : Methods of a sexual propagation
Six Week : Vegetative propagation and its relation to keeping genetic purity
Seventh Week: Mid term Exam
Eight weeks: Continue. **:** Vegetative propagation and its relation to keeping genetic purity
Nine Week : Handling of vegetative propagation materials
Ten Week: Factors affecting range land plant (biotic)
Eleven Week: Factors affecting range plant growth (biotic)
Twelve Week: Factors affecting range plant growth (abiotic)
Thirteen Week: Continue**:** factors affecting range plant growth a biotic
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Plant Genetic Resources**			
Module code	1107	Semester : 1	ECTS : 4	Elective Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	Non			
Postrequisite	1112- Advanced plant breeding			
Availability	Field visit, gene bank visit, textbook and website			
Aims	To learn and understand methods of genetics diversity and its conservation.			

	To develop student interest and awareness about management of genetic diversity resources.
Objectives	This course aims to teach students plant propagation, and the conserving of genetic origins, to teach plant variability and laboratory grouping of genetic origins and to study the conserving natural types in the future.

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	24h
Tutorials	-
Practicals	24h
Field visit	12h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1. The aim and scope of genetic conservation
2. Crop evolution and diversity
3. Exploitation of plant genetic resources
4. Collection of material from the field
5. Principles of conservation
    a. *in situ* and *ex situ*
    b. Gene banks and their role and methods
    c. Cryopreservation
6. Management of genetic diversity resources.
7. Seed propagation and its primary conservation.
8. Vegetative propagation using stem parts leaves and roots.
9. Propagation from unspecialized plant parts.
10. Propagation and conserving plant material.
11. Continuing conservation in the future.
    a. Biodiversity agreements (Rio convention)
    b. Limitation of trade of endangered species (CITES).

Literature

1) Bioversity's website (the biodiversity CGIAR institute, formerly IPGRI)
2) Carvalo J.A. and A. Culham (1997) Conservation studies and ply genetics of lsoplexis. Lindl Benth-Boletim does Museu Mumcipol Funchal.

Tentative Timetable

First week: The aim and scope of genetic conservation.
Second week: Crop evolution and biodiversity.
Third Week: Exploitation of plant genetic resources.
Fourth Week: Collection of materials from the field**.**
Fifth Week : Principles of conservation (Gene bank)
Six Week : Principles in situ and ex situ
Seventh Week: Mid Term Exam
Eight weeks: Management of genetic diversity resources
Nine Week : Management of genetic contrived
Ten Week: Seed propagation
Eleven Week: Vegetative propagation and conservation
Twelve Week: Continue Vegetative propagation and conservation
Thirteen Week: Continue Vegetative propagation and conservation
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final Exam

Module title	**Seed Production of Vegetables and Aromatic plants**			
Module code	1108	Semester : 2	ECTS : 4	Elective Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	1109- Propagation and production of ornamental plants			
Postrequisite	Non			
Availability	Seed company, Nursery visit, Field visit, Textbook, Course website			
Aims	The aim of this course is to teach students the importance of seed production and factors affecting production of vegetables aromatic, and Medicinal crops seeds.			
Objectives	Make students able to advise about the factors affecting production of vegetables and aromatic seeds. The student will be able to understand the care and safe use of tools of plant propagation. To provide student with role of the environmental factors affecting seed production of vegetables and aromatic plants .			

Teaching methods	Number of hours / semester
Lectures	48 h
Seminars	12 h
Tutorials	12h
Practicals	24 h
Field visit	12 h
Private study	12 h
Other	-
Total	120 h

Outline syllabus

1. Nursery preparation for vegetables and aromatic crops
   a. Effect of light periods on the production of vegetables seeds
   b. Effect of feeding state on the production of vegetables seeds
2. Effect edaphic factor on productivity of vegetables and aromatic plants.
3. Examples of aromatic plants, *e.g.*, peppermint, coriander, fennel, anise, tamarind
4. Examples of medicinal plants, *e.g.*, digitalis, belladonna, lupin
5. Producing important vegetables seeds tomatoes *e.g.*, pepper, eggplant, cabbages.

Literature

1) Nonneck L.I.(1989). Vegetables production .Van Nostrand New York P.657.

Tentative Timetable:

First week: Introduction
Second week: Nursery preparation for vegetable
Third Week: Nursery preparation for aromatic plants
Fourth Week: Edaphic factors affecting productivity of vegetables i.e. onion, cabbages
Fifth Week : Edaphic factors affecting productivity of vegetables i.e. onion, cabbages lettuce carrot
Six Week : Edaphic factors affecting productivity of vegetables i.e. onion, cabbages table beet
Seventh Week: Midterm Exam
Eight weeks: Edaphic factors affecting productivity of vegetables i.e. onion, cabbages tomato, cucumber .
Nine Week : Edaphic factors affecting productivity of. vegetable garden
Ten Week: Edaphic factors affecting productivity of aromatic fennel, celery, caraway

Eleven Week: Edaphic factors affecting productivity of. aromatic anise , rosemary .
Twelve Week: Edaphic factors affecting productivity of medical plants lupin, fenugreek
Thirteen Week: Edaphic factors affecting productivity of medical plants digitals chamomile
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Propagation And Production Of Ornamental Plants**			
Module code	1109	Semester : 1	ECTS : 4	Elective Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	1108- Seed production of vegetables and aromatic plant			
Postrequisite	1114- Seed production of cross pollinated crops			
Availability	Nursery visit, garden visit, textbook, seed company visit and website course			
Aims	The objective of this course is to teach students the factors affecting and methods used in production of ornamental plants			
Objectives	1- Make student able to know and identify methods ornamental plant production in the nursery. 2- Understand the care and safe use of tools in plant propagation. 3- Understand the biology of sexual and a sexual propagation of plants. 4- Understand and use the different styles of propagation of plants. 5- Student able to setup and use a plant propagation system. 6- Demonstrable an understanding of the different propagation methods of species			

Teaching methods	Number of hours /semester
Lectures	48 h
Seminars	12 h
Tutorials	12h
Practicals	24 h
Field visit	12 h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1. Nursery preparation for ornamentals
2. Seed production e.g., annuals for the ornamental plants.
3. grafted species *e.g.*, roses
4. Vegetative propagated plants
5. Bulbs
6. Harvesting of ornamental plants.

Literature

i. **John Brookes (1998) The indoor Garden book . K ind Erseley.UK.288pp.**

2)Herrey J (1995). Herbs McDonald guidelines .London.

Tentative Timetable

First week: An introduction
Second week: Green houses, constricting, characterization pollution presentation

Third Week: Soil and nursery preparation **Fourth Week:** Seed production for annuals ornamental plants **Fifth Week :** Vegetative propagated plants **Six Week :** Vegetative propagated plants **Seventh Week:** Midterm exam **Eight weeks:** Successful production of grafted species and budding e.g. roses **Nine Week :** Production of bulbs i.e. spring flowering bulbs, spring care **Ten Week:** Production of bulbs i.e summer flowering bulbs, summer care **Eleven Week:** Applying nutrients and irrigation **Twelve Week:** Applying pesticides and pest control integrated pest management **Thirteen Week:** Harvesting ornamental crops **Fourteen Week:** Oral and practical Exam **Fifteen Week:** Final Exam

Module title	**Applied Information Technology**			
Module code	1110	Semester : 2	ECTS : 2	Compulsory Course
Leader				
Other staff				
Prerequisites	English I			
Concurrent	Non			
Postrequisite	Non			
Availability	Computer Lab and references			
Aims	This course is an introduction to the uses, concepts techniques and terminology of computing. The main goal is to allow students to become self- sufficient computer users. This goal is achieved through the practical application of word processing, spreadsheet, presentation and internet access software			
Objectives	Student will be able to 1) apply information processing skills and concepts to perform multiple tasks of gathering, creating and analyzing data to produce reports. 2). Identify computer terms 3). Define computer terms 4) Operate and interact with computer, using windows XP and Microsoft word 2007. 5). To learn students computer skills with respect to internet sources			

Teaching methods	Number of hours / semester
Lectures	24h
Seminars	-
Tutorials	12h
Practicals (lab)	24h
Field visit	-
Private study	-
Other	-
Total	60 h

Outline syllabus

1. Introduction to computer and its usage.
2. Windows and its applications.
3. Word and its uses.
4. Practical applications of "Word".
5. Introduction to "Power Point".

6. Introduction in Excel program. 7. Photo Shop practical application. 8. Use of literature data bases and library
Literature 1) Stephen, D. (2001) Information systems for you. Nelson Thomas Ltd. , UK.
Tentative Timetable **First week:** introduction to computer and network uses **Second week:** Windows and its applications **Third Week:** Windows practical applications **Fourth Week:** Word and its uses **Fifth Week :** Practical application of word **Six Week :** Introduction to power point **Seventh Week:** Midterm exam **Eight weeks:** Cont. introduction to power point **Nine Week :** Introduction to Excel program 2003 **Ten Week:** Cont'd introduction to Excel program 2003 **Eleven Week:** Photoshop practical application **Twelve Week:** Net information **Thirteen Week:** Use of literature data bases and library **Fourteen Week:** Oral and Practical Exam **Fifteen Week:** Final exam

Module title	**Seed testing**			
Module code	1111	Semester : 2	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	1103- Seed Physiology			
Concurrent	Non			
Postrequisite	1122- Seed Industry and 1123- Seed Storage			
Availability	Seed testing lab, Textbook, Website course and field visit			
Aims	Teach students internationally accepted methods (ISTA) and standards for testing seed quality. To provide basic understanding to concepts of seed deterioration and longevity. To Learn student develop an understanding of seed quality components including genetic and physical purity, germination capacity, vigor, size, uniformity and seed born diseases.			
Objectives	To teach students the propose of seed testing and methods of seed testing To provide students with practical training on the different methods of seed testing. To discuss various factors that affect seed quality such as growing conditions, seed moisture content relations and storage systems.			

Teaching methods	Number of hours /semester
Lectures	48h
Seminars	12h
Tutorials	12h
Practicals	24h
Field visit	12 h
Private study	12 h
Other	-

Total	120h

Outline syllabus

1. Importance of seed quality.
2. Field inspection.
3. Genetic purity of seed.
4. Seed quality evolution:
    a. Sampling
    b. Purity analysis
    c. Germination test
    d. Biochemical tests for seed viability.
    e. Seed health and vigour test
    f. Methods of seed vigour determination.
    g. Thousand-seed weight.
    h. Use of DNA fingerprinting techniques to identify contaminants.
5. National and international seed lot certification.

Literature

1- ISTA rules and handbooks – [add URL]

2- Basra A.S.(2006).Handbook of seed science and technology. Food Product Press, An imprint of the Haworth Press, Inc. New York , London , Oxford.

3- Mathur S.B. and O. Kongsdal (2003). Common Laboratory Seed Health Testing Methods for Detecting Fungi. International Seed Testing Association , Basserdorf.

4- Balck M. ;Bewley D. And Halmer P. (2006).The Encyclopedia of Seeds : Sciences ,Technology and Uses. CABI.

5- WWW.Seedtest.org

Tentative Timetable:

First week: Introduction
Second week: Seed quality and its importance
Third Week: Field inspection
Fourth Week: Genetic purity of seeds
Fifth Week : Seed quality evolution
    a- Sampling and purity analysis
Six Week : Seed quality evolution germination test, moisture
Seventh Week: Midterm exam.
Eight weeks: Seed quality evolution seed health and vigor test
Nine Week : Seed quality evolution biochemical tests for seed viability
Ten Week: Seed quality thousand seed weight and use of DNA fingerprint
Eleven Week: General conditions affecting seed quality a. Field production, processing
Twelve Week: General conditions of seed storage
Thirteen Week: Seed certification (National and international)
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Advanced plant breeding**			
Module code	1112	Semester : 2	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	1104- Seed production of self pollinated crops -1114- Seed production of cross pollinated crops			
Concurrent	-			

Postrequisite	1125- Plant biotechnology
Availability	Field visit, breeding station, text book and website course
Aims	To teach students advanced methods applied in modern plant breeding. To review several basic concepts that contribute to an understanding of the genetics and breeding of self and cross pollinated crops. To develop student interest and awareness of past and present activity reported in the literature on the genetic improvement of self and cross pollinated crops.
Objectives	To help students learn and understand basic principles of Mendelian genetics. To help student learn how crop improvement is affected by genetics. To discuss strategies and specific methods utilized in new varieties.

Teaching methods	Number of hours / semester
Lectures	48h
Seminars	24h
Tutorials	-
Practical	24h
Field visit	12h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1. Design and implementation of plant breeding programmes.
2. Sources of genetic variation.
3. Mendelian genetics in practise.
4. Marker-assisted breeding
5. Molecular markers.
6. Breeding of F1 hybrid and synthetic cultivars.
7. Self-incompatibility.
8. Male sterility, *e.g.*, maize cultivars
9. Breeding of onion hybrid cultivars.
10. Hybrid seed production.
11. Breeding for disease resistance in plants.
12. Introduction to biotechnological methods using in plant breeding.

Literature

1- Ram, H.R. and H.G. Singh (2003) Crop breeding and genetics.Kalyani Publ. New Delhi India

Tentative Timetable

First week: General approach
Second week: Design and implementation of plant breeding program
Third Week: Source of genetic variation
Fourth Week: Mendelian genetics practise
Fifth Week : Marker – assisted breeding
Six Week : Molecular marker
Seventh Week: Midterm exam
Eight week: Breeding of F_1 hybrid and synthetic cultivars
Nine Week : Self – incompatibility
Ten Week: Male sterility.
Eleven Week: Onion hybrid seed production
Twelve Week: Breeding for disease resistance and biotechnological method**.**
Thirteen Week: Breeding for disease resistance and biotechnological method**.**

Fourteen Week: Oral and Practical Exam. **Fifteen Week:** Final exam

Module title	**Seed Processing**			
Module code	1113	Semester : 2	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	1103- Seed Physiology			
Concurrent	1122- Seed Industry			
Postrequisite	1123- Seed Storage			
Availability	Visit for storage site, References and Website course			
Aims	To describe the methods of seed processing from harvest to use methods of harvest and post harvests operations of crops to teach students processing operation, pre-cleaning, drying, grading and separation.			
Objectives	To teach students methods of seed processing. To teach students the importance of seed handling and marketing**.** To discuss various factors that affects seed quality such as harvesting, threshing, cleaning, drying techniques and seed treatments.			

Teaching methods	Number of hours/semester
Lectures	48 h
Seminars	12h
Tutorials	-
Practicals	36h
Field visit	12h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1. Importance of seed processing for the seed industry
2. Characteristics of harvested seed material, *e.g.*, contamination with weed seed, gravel and other inanimate material, immature seed, pests and pathogens.
3. Postharvet handling of seed (e.g., dry seed, cuttings and tubers).
4. Methods of seed drying.
5. Cleansing and cleaning of seed, cleaning and grading machinery for different species.
    - Threshing, masks etc
6. Seed Grading
7. Seed dressing
8. Seed priming
9. Seed coating
10. Seed pelleting
11. Seeding belting (vegetable seed)
12. Other treatments.
13. Handling and packaging of seed

Literature

1) Asiedu , J.J. (1992) Processing tropical crops. M.Macmillan.
2) Desai B.B.; P.M. Kotecha and D.K. Salunkhe (1997). Seeds Handbook. Biology, Production, Processing and Storage Marcel Dekker , Inc. New York Basel, Hong Kong.

3) Balck M. ;Bewley D. And Halmer P. (2006).The Encyclopedia of Seeds : Sciences ,Technology and Uses. CABI.
Tentative Timetable: **First week:** General approach **Second week:** Seed harvesting and extraction **Third Week:** Seed processing and handling **Fourth Week:** Seed grading and Seed drying **Fifth Week :** Seed storage and Seed longevity **Six Week :** Seed dormancy and Germination testing **Seventh Week:** Midterm exam **Eight weeks:** Germination enhancement techniques **Nine Week :** Seed treatments **Ten Week:** Continue Seed treatments **Eleven Week:** Seed labelling **Twelve Week:** Shipping seeds **Thirteen Week:** Certified seeds **Fourteen Week:** Oral and Practical Exam **Fifteen Week:** Final Exam

Module title	**Seed production of cross pollinated crops**			
Module code	1114	Semester : 2	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	1104- Seed production of self pollinated crops			
Concurrent	Non			
Postrequisite	1125- Plant biotechnology			
Availability	Field visit, breeding station, Seed company, Textbook and website course			
Aims	This course aims to teach students: • Methods and stages of crop production of cross pollinated crops, • To teach students the agronomic practices for higher productivity of hybrids • Teach student methods of hybridization of cross pollinated crops.			
Objectives	To make students give advised about production and methods of hybridization of cross pollinated crops. To Provide student basic principals in the genetic improvement of cultivars in cross pollinated crops . To learn students the environmental factors affecting production of cross pollinated crops.			

Teaching methods	Number of hours /semester
Lectures	48h
Seminars	12h
Tutorials	12h
Practicals	24h
Field visit	12h
Private study	12h
Other	-
Total	120 h
Outline syllabus	

1. Distribution of cross pollinated crops in Egypt and the world.
2. Fertilization of cross pollinated crops.
3. Environmental factors affecting cross pollinated crop production.
4. Producing cross breeding seeds in hybridization of pollinated crops.
5. Agronomic practices for high yield of cross pollinated crops *i.e.* maize, sunflower, cotton
6. Stages of seed production in cross pollinated crops.
    a. Example: cross pollinated program of maize breeding in Egypt.

Literature

1- Agrawal , R.L. (1998) Fundamentals of plant Breeding and Hybrid Seed Production . Science pub., Inc., New Hampshire.
2- Ram, H.R. and H.G. Singh (2003) Crop breeding and genetics. Kalyani Pub. New Delhi India.

Tentative Timetable:

First week: General approach
Second week: Distribution of cross pollinated crops
Third Week: Fertilization of cross pollinated crops
Fourth Week: Fertilization of cross pollinated crops
Fifth Week : Producing cross breeding seeds in hybridization of pollinated crops i.e corn
Six Week : Producing cross breeding seeds in hybridization of pollinated crops i.e canola
Seventh Week: Midterm exam
Eight weeks: Producing cross breeding seeds in hybridization of pollinated crops (sunflower).
Nine Week : Producing cross breeding seeds in hybridization of pollinated crops (sesame)
Ten Week: Stages of seed production in cross pollinated crops (corn)
Eleven Week: Stages of seed production in cross pollinated crops (canola)
Twelve Week: Stages of seed production in cross pollinated crops (sunflower)
Thirteen Week: Stages of seed production in cross pollinated crops(sesame)
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Advanced design and Analysis of Experiments**			
Module code	1115	Semester : 2	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	Non			
Concurrent	Non			
Postrequisite	Non			
Availability	Computer Lab, textbook and website course			
Aims	This course plays an effective role in helping students learn analysis of variance methods and different measures used. To educate students on how to design different experiments and to calculate methods analysis of variance methods and to teach student how to compare between means.			
Objectives	1- Student should have a general understanding basic statistics and how it applies to research. 2- Should have a basic understanding of experimented design, how to plan, conduct, analysis enterprise results of basic experiments 3- Student should able to input and manage data in spreadsheet such			

	as Excel.

Teaching methods	Number of hours / semester
Lectures	48h
Seminars	-
Tutorials	24h
Practicals	24h
Field visit	-
Private study	12h
Other	12h
Total	120 h

Outline syllabus

1- Scientific method and design of experiments
2-Importance of statistics in scientific research
3- Statistical analysis of normally distributed data
4- Statistical analysis of binomially distributed data
5- Simple line regression
6- Simple correlation
7- Completely randomized designs
8- Methods to compare between means
9- Complete block design
10- Latin square design
11- Factorial experiments.
12- Split plot design.
13- Use of statistical software *e.g.*, "R" or "SAS"

Literature

1) Steel, R. G. D. and Torrie, J.H. (1982). Principles and procedures of statistics, 2nd . Ed. , Mc Grow Hill book co. New York.
2) Gomez , K.A. and Gomez, A.A. (1984). Statistical procedures for agriculture research 2nd. Ed. On international Rice. Institute book. John Wiley Sons. New York

Tentative Timetable

First week: An introduction to expermintal design.
Second week: Scientific methods in research and design of experiments
Third Week: Replication, plot size and shape and randomization
Fourth Week: Statistical analysis of binomially distributed data
Fifth Week : Simple line regression
Six Week : Simple correlation
Seventh Week: Midterm exam.
Eight weeks: Completely randomized designs
Nine Week : Randomized complete block .
Ten Week: Latin square design
Eleven Week: Factorial experiments
Twelve Week: Split plot design
Thirteen Week: Using computer for analysis of experiments
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final Exam

Module title	**English Language II**			
Module code	1116	Semester : 2	ECTS : 2	Elective Course
Leader				
Other staff				
Prerequisites	English I			
Concurrent	-			
Postrequisite	-			
Availability	Textbook, English lab, References			
Aims	The aim of this course is to train students in reading and writing texts and using agriculture vocabulary in English.			
Objectives	To define and develop communication and consultation techniques To define and practice the principles of good discussion in both large and small groups proc. The To become committed to a professional life by student reading professional journals and attending professional meetings			

Teaching methods	Number of hours /semester
Lectures	24h
Tutorials	12h
Practicals	24h
Other	-
Total	60h

Outline syllabus

1. Methods of reading and writing texts in English.
2. Structure of English sentences
3. An application of some scientific agricultural topics
4. Practice in language skills.
5. Advanced application lectures in preparation for TOEFL Exam.

Literature

1- English for Scientific students (1995) Longman press.

Tentative Timetable:

First week: Cross- cultural connections – the parts of a plant and their functions
Second week: Cross – cultural connections (cont.) – The parts of a plant and their functions (cont.)
Third Week: Playing to win – The life cycle of a plant
Fourth Week: Playing to win (cont.) – The life cycle of a plant (cont.)
Fifth Week : Universal mysteries – The origin and composition of soil
Six Week : Universal mysteries (cont.) – The origin and composition of soil (cont.) Drainage and irrigation
Seventh Week: Mid Term Exam
Eight weeks: Our fragile plant (cont.) – Drainage and irrigation (cont.)
Nine Week : Getting Down to business – Manures and fertilizers
Ten Week: Getting down to business (cont.) – Manures and fertilizers (cont.)
Eleven Week: The power of music – The control of weeds and plant diseases
Twelve Week: The power of music (cont.) – The control of weeds and plant diseases (cont.)
Thirteen Week: Are you superstitious? – Market gardening
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final Exam

Module title	**Plant Protection**			
Module code	1117	Semester : 2	ECTS : 2	Elective Course
Leader				
Other staff				
Prerequisites	1105- Plant Pathology			
Concurrent				
Postrequisite	1125- Plant biotechnology			
Availability	Lab, textbook , website course and reference			
Aims	Describes the main means used for controlling plants from pests, pathogens and weeds. To provide an overview of the biology, ecology and classification of insect pathogens, predators and parasitoids. To discuss the use of these organisms in plant protection, including an emphasis on genetic alteration of natural enemies.			
Objectives	To teach students the resistance of cereal and it products to pests and to study factors affects pest controlling. Describe the mission structure and function of APHIS. Describe the role scientific disciplines of entomology and ecology in relation to the regulatory process. Identify and describe new methods of pest detecting identification and methods of integrated management.			

Teaching methods	Number of hours /semester
Lectures	24h
Seminars	-
Tutorials	-
Practicals	24h
Field visit	12h
Private study	-
Other	-
Total	60 h

Outline syllabus

1. Principals of control.
2. Cultural practices and their impact on the environment and human health.
3. Prevention including use of clean seed.
4. Disease and pest control through resistance.
5. Biological Control of pests, pathogens and weeds.
6. Use of chemical control agents.
7. Forecasting systems.
8. Threshold values for control of pests, pathogens and weeds.
9. Weed control by allelopathy.
10. Environmental system and various factors affecting insects
11. Integrated pests control

Literature

G. N. Agrios. *Plant pathology,* Amsterdam: Elsevier, 2005. 922 pages. Is verbose and is biased to North American conditions, but does have excellent illustrations.

Tentative Timetable

First week: Introduction principals of plant protection

Second week: Cultural practices and their in pact on the environment and human health.
Third Week: Prevention including use of clean seeds
Fourth Week: Disease and pest control through resistance (host plant resistance \)
Fifth Week : Biological control of pests, pathogens and weeds
Six Week : Chemical control
Seventh Week: Midterm exam
Eight weeks: Forecasting system
Nine Week : Threshold values for control of pests, pathogens and weeds
Ten Week: Weed control by Allelopathy
Eleven Week: Environmental system and various factors affecting insects
Twelve Week: Integrated pest control
Thirteen Week: Continue integrated pest control
Fourteen Week: Oral and Practical Exam.
Fifteen Week: Final exam.

Module title	**Seed Borne Disease**			
Module code	1118	Semester : 2	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	1105- Plant Pathology			
Concurrent	-			
Post requisite	1126 Seed Borne Fungai + 1128 Seed Borne Bacteria + 1127 Seed Borne Viruses			
Availability	Textbook, Website, References, Labs			
Aims	to introduce the basics of seed pathology in a coherent system of postgraduate education			
Objectives	To teach students principles of seed borne diseases . to introduce the basics of seed pathology in a coherent system of diseases affect seeds and to outline the principles of different subjects based on facts and views.			

Teaching and learning methods	Number of hours /semester
Lectures (3 hours/week)	36
Seminars (2 hour/week)	24
Tutorials, video and Multimedia teaching	7
Practicals (4 hours / week)	48
Field visit (2 h X 7 weeks)	14
Private study	16
Practical, Oral and Written examination	5
Total	150

Outline syllabus

Economic significance and impact of seed borne diseases on animal and human health – types of seed –borne diseases – biotic and abiotic - factors affecting establishment and disease cycles- basics of seed health testing – case studies on economic seed borne disease in Egypt and the world. Principles of seed borne diseases .

Literature

1- Neergaard, P. (1979) Seed Pathology, vol. 1 and 2, Revised Edition MacMillan Press, London, 1191 pp.
2- AGARWAL, V.K.; SINCLAIR, J.B. Principles of seed pathology, 2.ed. Boca Raton: CRC, 1997. 538pp.

Week	**Subject**
First week	Economic significance of seed-borne diseases
2	Impact of seed borne diseases on economy, human and animal health.
3	Types of seed borne diseases (I)
4	Types of seed borne diseases (II)
5	Factors affecting establishment and disease cycles (I)
6	Factors affecting establishment and disease cycles (II)
7	Midterm Exam
8	Basics of seed health testing (I)
9	Basics of seed health testing (II)
10	Case studies on important seed borne diseases (I)
11	Case studies on important seed borne diseases (II)
12	Principles of seed borne disease management
13	Principles of seed borne disease management
14	Practical and Oral Exam
15	Written Exam

Module title	**Seed Ecology**			
Module code	1119	Semester : 2	ECTS : 4	Elective Course
Leader				
Other staff				
Prerequisites	1103- Seed Physiology			
Concurrent	1111- Seed testing			
Postrequisite	1122- Seed Industry			
Availability	Textbook, Website and References and Field visits			
Aims	The aims of this course is to raise student skills knowledge about seed germination and factors affecting it and types of dormancy and factors affecting it. To discuss interactions between species and the environment that determines common seed composition and structure.			
Objectives	To explain the processes that influence seed distribution. To apply ecological principles to current seed conservation issues. To identify the ecophysiological aspects of seeds regulating germination in differing environments.			

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	12h
Tutorials	12h
Practicals	24h
Field visit	12h
Private study	12h
Other	-
Total	120 h

Outline syllabus

1- Seed banks
2- Seed dormancy
3- Survival and viability of seeds
4- Factors affecting seed production e.g. density of the stand, soil factors, and competition form

other plants including weeds, other kinds of interaction with plants *e.g.*, allelopathy, parasitic.
5- Seed dispersal
6- Genetic diversity
7- The effects of environmental stress on seed quality and survival.

Literature

1- Nicolas, G.; K.J. Bradford; D. Come and H. Pritchard (2003). The Biology of seeds: Recent Research Advances CABI Publishing, Wallingford.
2- Black M. and J.D. Bewley (2000).Seed Technology and its Biological Basis. Sheffield Academic Press.
3-Balck M.; Bewley D. And Halmer P. (2006).The Encyclopedia of Seeds : Sciences ,Technology and Uses. CABI.

Tentative Timetable

First week: Overview
Second week: Seed bank
Third Week: Seed dormancy and factors affecting it
Fourth Week: Survival and viability of seeds and germination
Fifth Week : Interactive effects between crops and other edaphic factors i.e. Allelopathy
Six Week : Seed dispersal, Trees, Herbs
Seventh Week: Midterm exam
Eight weeks: Seed dispersal, Trees, Herbs
Nine Week : Genetic diversity
Ten Week: Genetic diversity
Eleven Week: Environmental stress and seed quality and survival
Twelve Week: Economical cultural tactass and Biotic factor
Thirteen Week: Temperature and other abiotic factors
Fourteen Week: Oral and Practical Exam.
Fifteen Week: Final exam

Module title	**Research Methods and Thesis Writing (a&b)**			
Module code	1120	Semester : 3	ECTS : 4	Compulsory Course
Leader				
Other staff				
Prerequisites	1116- English language II			
Concurrent	-			
Postrequisite	-			
Availability	Website, References and Text book			
Aims	For Seed technology specialisation The aims of this course are to each student how to research and write the master thesis. To give student basics of methods of literature searching and academic rules of writing the scientific article. To develop an appreciation for research as a process with distinct components. To provide an environment in which these components can be practiced. Participants will develop new knowledge about the research process and apply their knowledge in designing a sample project.			
Objectives	To equip the students with the skills and experience required for writing informational (e.g. summary, abstract) and analytical (e.g. research paper, thesis etc.) reports.			

	To equip students with the communication techniques and skills for oral presentations of the report contents.

Teaching methods	Number of hours /semester
Lectures	48h
Seminars	12h
Tutorials	12h
Practicals	24h
Field visit	-
Private study	12h
Other	12h
Total	120 h

Outline syllabus

1. Reasons for scientific writing
2. Academic and general writing
3. Sources of information, research and verification of facts
4. Organization of information
5. Preparing illustrations
6. References
7. Writing a report, an article or a thesis
    a. Technical reports
    b. Thesis and research papers
    c. Steps of preparing and writing a report or an article
    d. Preparing and submitting a scientific paper for publication in international refereed journals.
8. Conference articles and posters

Literature

1) **Cooper, B. M. (1976). Writing technical reports. Penuries Books Ltd, England.**

Tentative Timetable

First week: General approach for scientific method
Second week: Steps of the scientific method
Third Week: Historical errors of the scientific methods.
Fourth Week: Preparation of scientific thesis introduction, Review of literature, M.M
Fifth Week : Preparation of scientific thesis results and discussion,
Six Week : Summary and illustration , Reference**s**
Seventh Week: Midterm Exam
Eight weeks: How to prepare abstract and writing information (e.g. summary, abstract) (e.g. research paper, thesis etc) reports.
To equip students with the communication techniques and skills for oral presentations of the report contents poster guidelines of scientific paper
Nine Week : Scientific reports background and pre-writing
Ten Week: Scientific reports background and pre-writing continued
Eleven Week: Concept of research paper and their contents
Twelve Week: Preparation and revision of scientific manuscript
Thirteen Week: Electronic scientific manuscript submission
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**World seed market**			
Module code	1121	Semester : 3	ECTS: 4	Compulsory course
Leader				
Other staff				
Prerequisites	1113- Seed processing			
Concurrent	-			
Postrequisite	1124- Industrial use of seeds			
Availability	Website, References			
Aims	To elusive the nature of the seed industry in a national and international context.			
Objectives	Size and structure market of seeds in different countries and seed trade barriers			

Teaching methods	Number of hours/ semester
Lectures	48 h
Seminars	12h
Tutorials	-
Practicals	12h
Field visit	24h
Private study	12h
Other	12h
Total	120 h

Outline syllabus

1. International seed market formation.
2. World seed market.
3. Egyptian seed market.
4. International seed trade.
5. Structure of the seed industry
6. International and national seed organizations (e.g. FAO, ISTA, ISF, UPOU, OECD, WTO, SSP)
7. Globalisation and the seed industry.
8. International seed trade regulations.
9. International seed movement barriers: tariffs, quota, phytosanitary regulations (quarantine), seed systems of selected countries.
10. Seed legistration of chosen countries
11. Liberalizing and privatizing the sector in Egypt.

Literature

1-Much relevant information is available on the www from ISF, ISTA, FAO

2- Mumby, G. (1994).Seed Marketing .FAO Agriculture Services Bulletin 114.FAO,Rome

Tentative Timetable:

First week: General approach international seed market formation
Second week: World seed market for crops
Third Week: Egyptian seed market
Fourth Week: International seed trade
Fifth Week : Structure of seed industry
Six Week : International and national seed organizations
Seventh Week: Midterm exam
Eight weeks: Globalisation and the seed industry
Nine Week : International seed trade regulations
Ten Week: International seed movement barriers

Eleven Week: International seed movement barriers (continue) **Twelve Week:** Seed legistration of chosen countries **Thirteen Week:** Liberalizing and privatizing the sector n Egypt **Fourteen Week:** Oral and Practical Exam. **Fifteen Week:** Final exam

Module title	**Seed Industry**			
Module code	1122	Semester :3	ECTS: 5	Compulsory Courses
Leader				
Other staff				
Prerequisites	1113- Seed processing			
Concurrent	1124- Industrial use of seeds			
Postrequisite	1125- Plant Biotechnology			
Availability	Textbook, Website, References and Factory visits			
Aims	To present the nature of the enterprises involved in the seed and plant breeding companies.			
Objectives	-Establish some basic general concepts, definitions about seed supply and the roles of public and private seed supply in the economy. -Describe the seed industry and the major groups of participants. -Describe the tasks of crop improvement and seed production. -Describe how the basic management processes related to the seed industry and describe the integrative role of management. -Describe ethical approaches for the seed industry. -Describe seed biotech regulations.			

Teaching methods	Number of hours /semester
Lectures	48h
Seminars	12h
Tutorials	-
Practicals	12h
Excursions	54h
Private study	12h
Other	12h
Total	150 h

Outline syllabus

1. The role, specificity and history of the seed industry.
2. The international seed industry.
3. Types and structures of breeding and seed companies.
4. Seed organization and some technical and institutional aspects for seed production
5. Plant breeders' rights.
6. production of seed: contract structures.
7. Seed marketing, *e.g.*, marketing pipeline, product life cycle, cultivar market life span, objectives of marketing, cultivar lists, marketing organisations, marketing plan, market procedures, seed dealers, contracts for production.).
8. Risk management in seed market.
9. International trade structures and mechanisms of trade (national and international payment methods *e.g.*, incomer's, letters of credit etc).
10. Restructuring government seed centres into private small-scale enterprises in Egypt.

Literature Web based for companies and NGOs' etc
Tentative Timetable **First week:** Brief overview **Second week:** The international seed industry. **Third Week:** Development of the seed industry worldwide **Fourth Week:** Types and structures of breeding and seed companies **Fifth Week :** Seed organization and some technical and institutional aspects for seed product **Six Week :** Plant breeders rights **Seventh Week:** Midterm exam **Eight weeks:** Contract structures **Nine Week :** Seed marketing and factors effecting markets **Ten Week:** Risk management in seed market **Eleven Week:** International seed industry **Twelve Week:** International seed industry **Thirteen Week:** Restructuring government **Fourteen Week:** Oral and Practical Exam **Fifteen Week:** Final exam

Module title	**Seed Storage**				
Module code	1123	Semester: 3	ECTS : 6	Compulsory Course	
Leader					
Other staff					
Prerequisites	1103- Seed physiology				
Concurrent	1111- Seed testing				
Postrequisite	-				
Availability	Seed storage, Textbook and Website course				
Aims	To teach the student the processes, methods and types of facilities used in storage and environmental effects on seed quality and longevity. To learn students the importance of relative humidity and temperature for seed longevity and seed variability				
Objectives	To teach students methods of storage and to give students skills about methods of storage and factors affecting it. Learn student seed importance of seed viability in relation to seed structure, pre harvest, field condition and post harvest handling and processing				

Teaching methods	Number of hours /Semester
Lectures	48h
Seminars	18h
Tutorials	-
Practicals	48h
Field visit	48h
Private study	18h
Other	-
Total	180 h

Outline syllabus

1. Seed longevity
2. Seed deterioration

3. The purpose of seed storage
4. The environmental factors affecting seed viability during storage.
5. Short and long term storage.
6. Seed packaging (open or sealed packaging)
7. Storage facilities and equipment (*e.g.* dry, refrigerated)
8. Methods of storing seeds and factors affecting seed storage
9. Pests and pathogens affecting stored seed.

Literature

1) Joshi, A.K. and B.D. Singh (2002) .Seed Science and Technology. Kalyani Pub.
2) Doijode , S.D.(2001). Seed storage of horticulture crops .Food Products Press .An Imprint of the Haworth Press, Inc.New York ,London ,Oxford.
3)Balck M. ;Bewley D. And Halmer P. (2006).The Encyclopedia of Seeds : Sciences ,Technology and Uses. CABI.

Tentative Timetable:
First week: General approach
Second week: Seed longevity
Third Week: Seed bank
Fourth Week: Purpose of seed storage
Fifth Week : Seed storage, what mean, whe seed stored ?
Six Week : Environmental factors affecting seed viability during storage
Seventh Week: Midterm exam
Eight weeks: Short and long term storage .
Nine Week : Seed drying methods and seed dry types .
Ten Week: Factors affecting dry conditions .
Eleven Week: Methods of sorting seed storage
Twelve Week: Seed packing and handling systems
Thirteen Week: Storage capacity
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Industrial Use of Seeds**				
Module code	1124	Semester :3	ECTS: 5	Compulsory Course	
Leader					
Other staff					
Prerequisites	1122- Seed industry				
Concurrent	-				
Postrequisite	-				
Availability	Textbooks, website, References and Food processing factory				
Aims	The aim is to give students skills and knowledge of seed structures and methods of production in relation to use. Learn about quality measurements and grading.				
Objectives	To give students knowledge and information about the reserve materials of seeds and the technical methods for extraction in practices. To explain the relation ship between production and seed quality.				

Teaching methods	Number of hours /semester
Lectures	48h
Seminars	12h
Tutorials	-

Practicals	24h
Field visit	48h
Private study	18h
Other	-
Total	150 h

Outline syllabus

1. Milling.
2. Use in bread making,
3. Production of starch,
4. Production of high quality corn
5. Oil production and technology
6. Fiber production quality
7. Measurements of seed quality
8. Differences between cultivars and hybrids
9. Methods of seed production affecting seed quality of some fiber crops i.e. cotton and flax
10. Methods of production affecting seed quality of some oil crops i.e. sesame and sunflower

Literature

1) Egli, D.B. (1998) Seed Biology and The Yield of Grain Crops. ISBN.

Tentative Timetable

First week: Overview
Second week: Milling ,Wheat
Third Week: Bread making
Fourth Week: Production of starch, refining, drying gluten
Fifth Week : Production of high quality corn
Six Week : Oil production, refining and technology
Seventh Week: Midterm exam
Eight weeks: Measurements of seed quality
Nine Week : Differences between cultivars and hybrids
Ten Week: Methods of seed production on affecting seed quality, fiber crops, cotton, flax
Eleven Week: Methods of seed production affecting seed quality, oil crops, sesame and sunflower
Twelve Week: Methods of seed production affecting seed quality, soybean and canola
Thirteen Week: Methods of seed production affecting seed quality, groundnut and corn
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam

Module title	**Plant Biotechnology(a&b)**			
Module code	1125	Semester : 3	ECTS : 6	Compulsory Course
Leader				
Other staff				
Prerequisites	1112- Advanced Plant Breeding			
Concurrent				
Postrequisite				
Availability	Biotechnology Lab, Website and References			
Aims	To teach about the main biotechnological and molecular methods used in agriculture and the current and potential application for crop improvement using biotechnology.			
Objectives	To gain an understanding of the techniques and terminology of biotechnology. To understand the applicability of agriculture biotechnology			

	To appreciate the native of environmental and ethical concerns over biotechnology. To be able to participate in informed public discussions about plant biotechnology particularly the use of genetically modified organisms in agriculture

Teaching methods	Number of hours/semester
Lectures	48h
Seminars	24h
Tutorials	18h
Practicals	48h
Field visit	24h
Private study	18h
Other	-
Total	180 h

Outline syllabus

1. Recap of sources of genetic variation for breeding.
2. Recap of genetics of plants.
3. Gene structure and expression.
4. Plant tissue culture e.g., meristem culture, haploid production.
5. Transgenic plants (GM crops).
6. Applications of biotechnology in plant protection.
    a. Herbicide resistance.
    b. Insect resistance and BT.
    c. Virus resistance.
    d. Industrial products: *e.g.*, starch, biomedicine etc
    e. Prospects and constraints for other important traits, fungal diseases, salinity and other environmental stress, nitrogen fixation.
7. Bioinformatics and genomics.

Literature

1) Taii , A. ;P.P. Kumar and P. Laksh Menen (2002) . In vetro plant breeding. Howortn press. INE New York , London.
2) Ram, H.R. and H.G. Singh (2003) Crop breeding and genetics.Kalyani Publ. New Delhi India.

Tentative Timetable

First week: Basic primer on biotechnology
Second week: What is biotechnology?
Third Week: Status and prospects of biotechnology in Egypt
Fourth Week: Gene structure and expression
Fifth Week : Transgenic maize
Six Week : Transgenic plants (GM crops) i.e resistant toabiotic stresses and biotic resistance
Seventh Week: Midterm exam
Eight weeks: Applications of biotechnology in plant protection.
Nine Week : Drought tolerant, production of pathogen – free plants, herbicide resistance plants
Ten Week: Industrial products i.e. SCP, lingo- cellulose fermentation
Eleven Week: Bioinformatics and genomics
Twelve Week: Genetic engineering and Agriculture.

Thirteen Week: Continue: Genetic engineering and Agriculture .
Fourteen Week: Oral and Practical Exam.
Fifteen Week: Final exam**.**

Module title	**Seed borne fungi**			
Module code	1126	Semester : 3	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	1105- Plant pathology + 1129- Transmission and Control of Seed Borne diseases and pests			
Concurrent	-			
Postrequisite				
Availability	Textbook, Website, References, Labs			
Aims	Importance of fungal pathogens, to introduce the main types o plant diseases and the biology of the organisms causing diseases seed borne diseases			
Objectives	The objective of this course is to teach student fungi types, how they infect the seed, the diseases caused by fungi and how to resist them. This specialty will develop basic knowledge in plant pathology situated in their ecological, technical and human contexts, as techno scientific procedures exploiting human beinge' characteristics for production purposes.			

Teaching methods	Number of hours /semester
Lectures	36h
Seminars	24h
Tutorials	7h
Practicals	48h
Field visit	14h
Private study	16h
Other	5h
Total	150 h

Outline syllabus

1. Economic significance of seed-borne diseases
2. Taxonomic groups of seed-borne fungi
3. Impact of seed borne fungi on yield
4. Types of hosts in relation to types of pathogens
5. Environmental biotic and abiotic factors affecting establishment and course of disease
6. Seed crop management
7. Study of important seed borne fungal diseases in major field crops
8. Study of important seed borne fungal diseases in major Horticulture crops
9. Assessment of seed borne fungal inoculums
10. Management of seed-borne fungal diseases

Literature

1) Neergaard, P. (1979) Seed Pathology, vol. 1 and 2, Revised Edition MacMilan Press. London, 1191 pp.
2) Agarwal, V.K.; Sinclair, J.B. Principles of seed pathology, 2. Ed. Boca Raton: CRC, 1997. 538PP.

3) Mathur, S.B. and Kongsdal, Olga (2003). Common Laboratory Seed Health Testing Methods for Detecting Fungi International Seed Testing Association, Bassersdorf. Switzerland, 427 pp.
4) Tribhuwan Singh and Kailash Agrawal., 2001. Seed Technology and Seed Pathology Jaipur, Pointer Publishers xiv. 498pp.
Maude, R.B. Seed borne diseases and their control. Cambridge: CAB International 1996. 280 pp.

Tentative Timetable
First week: Economic significance of seed-borne diseases
Second week: Taxonomic groups of seed-borne fungi
Third Week: Environmental biotic and abiotic factors affecting establishment and course of disease
Fourth Week: Study of important seed borne fungal diseases in major field crops (I)
Fifth Week : Study of important seed borne fungal diseases in major field crops (II)
Six Week : Study of seed borne fungal diseases in major Horticulture crops (I)
Seventh Week: Midterm exam
Eight weeks: Study of seed borne fungal diseases in major Horticulture crops (II)
Nine Week : Seed crop management
Ten Week: Assessment of seed borne fungal inoculums
Eleven Week: Seed Health testing methods (I)
Twelve Week: Seed Health testing methods (II)
Thirteen Week: Management of seed-borne fungal diseases
Fourteen Week: Practical and oral Exam
Fifteen Week: Final Exam

Module title	**Seed borne viruses**			
Module code	1127	Semester : 3	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	1105- Plant Pathology + 1129- Transmission and Control of Seed Borne diseases and pests			
Concurrent	1118- Seed borne Diseases			
Postrequisite				
Availability	Textbook, Website, References			
Aims	Importance of viral pathogens, to introduce the main types of plant diseases and the biology of the organisms causing diseases seed borne viral diseases .			
Objectives	The objective of this course is to teach student pathology of viral diseases including taxonomy, symptoms types, interference with the host, damage to crop.			

Teaching methods	Number of hours/semester
Lectures	36h
Seminars	24h
Tutorials	7h
Practicals	48h
Field visit	14h
Private study	16h
Other	5h
Total	150h

Outline syllabus

1. Economic significance of seed-transmitted viruses.
2. Seed transmission of viruses
3. Ecology epidemiology of seed-transmitted viruses
4. Control measures of seed-transmitted viruses

Literature

1) Neergaard, P. (1979) Seed Pathology, vol. 1 and 2, Revised Edition MacMillan Press London, 1191 pp.
2) Albrechsen, Sven Erik (2006) Testing Methods for Seed-Transmitted Viruses; Principles and Protocols CABI Publishing ISBN 0 851990169, 268 pp

Tentative Timetable

First week: Economic significance of seed-borne viruses
Second week: Seed-borne viruses: symptomlogy and diagnosis
Third Week: Classification and nomenclature of plant viruses
Fourth Week: Ecology epidemiology of seed-transmitted viruses
Fifth Week : Seed transmission of vruses
Six Week : Midterm exam
Seventh Week: Seed borne diseases caused by potyviruses
Eight weeks: Seed borne diseases caused by Cucmoviruses
Nine Week : Seed borne diseases caused by Cucumovirues
Ten Week: Seed borne diseases caused by Tobamovirues
Eleven Week: Seed borne diseases caused by Ilaviruses
Twelve Week: Seed Health testing methods
Thirteen Week: Management of seed-borne viral diseases
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final exam.

Module title	**Seed borne bacteria**			
Module code	1128	Semester : 3	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	1105- Plant pathology + 1129- Transmission and control of seed borne diseases and pests			
Concurrent	1118- Seed borne diseases			
Postrequisite				
Availability	Textbooks, Website, References, Lab			
Aims	Importance of bacterial pathogens , to introduce the main types of plant diseases and the biology of the organisms causing diseases seed borne viral diseases .			
Objectives	The objectives of this course is to teach student pathology of bacterial diseases including taxonomy, symptoms types, interference with the host, damage to crop.			

Teaching methods	Number of hours
Lectures	36h
Seminars	24h
Tutorials	7h
Practicals	48h
Field visit	14h

Private study	16h
Other	5h
Total	150h

Outline syllabus

1. Economic significance of seed-borne diseases
2. Classification of plant pathogenic bacteria
3. Pathogen Detection and Identification
4. Environmental factors affecting establishment and course of disease
5. Study of important seed borne bacteria diseases in major field crops
6. Study of important seed borne bacteria diseases in major Horticulture crops.
7. Assessment of seed borne bacterial inoculums
8. Management of seed-borne bacterial diseases

Literature

1- Neergaard, P. (1979) Seed Pathology, vol. 1 and 2, Revised Edition MacMillan Press, London, 1191 pp.

2- Saettler, A.W. ET AL . (EDS.) 1989. Detection of Bacteria in Seed and other planting Material. APS St. Paul 1989 Paperback 122 S.

3- Gardan, L.; Christen, R. 2000 Taxonomy of phytopathogenic pseudomonads. The 10th International Conference on Plant Pathogenic Bacteria, July 23-27, 2000. Charlottetown, Canada

4- Ronald Gitaitis, Ronald Walcott 2007, The Epidemiology and Management of Seedborne Bacterial Diseases. Annual Review of Phytopathology, September 2007. Vol. 45, Pages 371-397.

5- Veena, M.S., Shetty, H.S. Mortensen, C.N. and Mathur, S.B. (2000). Bacterial leaf Blight of Rice, Technical Bulletin. Department of Studies in Applied Botany. University of Mysore. Manasangotri, Mysore – 570 006, India and Danish Government Institute of Seed Pathology for Developing Countries, Denmark, 16 pp

Tentative Timetable

First week: Economic significance of seed-borne diseases
Second week: Environmental biotic and abiotic factors affecting establishment and course of disease
Third Week: Classification of plant pathogenic bacteria
Fourth Week: Seed borne diseases caused by Pesudomonads (I)
Fifth Week : Seed borne diseases caused by Pesudomonads (I)
Six Week : Seed borne diseases caused by Xanthomonas (I)
Seventh Week: Midterm exam
Eight weeks: Seed borne diseases caused by Xanthomonas (II)
Nine Week : Seed borne diseases caused by Erwinia
Ten Week: Seed borne diseases caused by Agrobacterium
Eleven Week: Seed borne diseases caused by Clavibacter
Twelve Week: Seed Health testing methods
Thirteen Week: Management for seed-borne bacterial diseases
Fourteen Week: Practical and Oral Exam
Fifteen Week: Final Exam.

Module title	**Transmission and Control of Seed Borne diseases and pests**			
Module code	1129	Semester : 3	ECTS : 5	Compulsory Course
Leader				
Other staff				
Prerequisites	1105- Plant Pathology			

Concurrent	-
Postrequisite	1126 Seed Borne Fungai + 1128 Seed Borne Bacteria + 1127 Seed Borne Viruses
Availability	Textbook, Website, References, Labs
Aims	Aims are to introduce the mechanisms of pathogens transmission via seeds and establishment course of diseases.
Objectives	To teach students mechanisms of seed transmission in relation to factors inherent to both pathogen and host, entry paths of seed infection environmental and physicochemical factors affecting establishment of seed borne diseases. Management of seed transmitted pathogens

Teaching methods	Number of hours
Lectures	36h
Seminars	24h
Tutorials	7h
Practicals	48h
Field visit	14h
Private study	16h
Other	5h
Total	150 h

Outline syllabus

Economic significance of seed-transmitted pathogens, Seed transmission of major economic pathogens, Ecology epidemiology of seed transmission and control measures of seed-transmitted viruses

Literature

1) Neeragaad, P. (1979) Seed Pathology, vol. 1 and 2Revised Edition MacMillan Press. London, 1191 pp.
2) Agarwal, V.K.; Sinclair, J.B. Principles of seed pathology, 2.ed. Boca Raton: CRC, 1997. 538 pp.
3) Albrechsen, Sven Erik (2006) Testing Methods for Seed-Transmitted Viruses: Principles and Protocols CABI Publishing ISBN 0 851990169, 268 PP

Tentative Timetable:

First week: Economic significance of seed-borne viruses
Second week: Seed infection and growth stages of plant
Third Week: Weather conditions and seed infection
Fourth Week: Time of flowering period and harvest and seed contamination or infection
Fifth Week : Midterm Exam
Six Week : Entry points seed infection : From mother plant
Seventh Week: Entry points seed infection : From outside plant
Eight weeks: Infected or contaminated parts of the seed
Nine Week : Seed-Plant Transmission, establishment of infection and course of disease
Ten Week: Effect of environmental factors on transmission and infection of seed
Eleven Week: Effect of biotic factors on transmission and infection of seed
Twelve Week: Inoculums potential effects on transmission and infection of seeds
Thirteen Week: Control measures of transmitted pathogens in relation to seed infection pathways.
Fourteen Week: Oral and Practical Exam
Fifteen Week: Final Exam.