Ph.D. in Cytology and Genetics Program

A. Basic Information

Program Title: Ph.D. in Cytology and Genetics Program
Program Type: Major
Department: Botany
Coordinator: Dr. Mahmoud Abderraouf Elshafey
Assistant Co-ordinator: Dr. Mohammad Othman Abdelmonem
Dates of program specifications approval: 11/5/2011

B. Professional Information

1. Program Aims
By the end of the Ph.D. in Cytology and Genetics program graduates must be able to:

1.1. Demonstrate proficiency in the application of basics and methodologies of scientific research in Cytology and Genetics and be able to develop methods and tools and new techniques.
1.2. Commitment to continuing self learning with work on the addendum to the knowledge in Cytology and Genetics with the awareness of ongoing problems and visions, and transfer of knowledge and expertise to others.
1.3. Apply the analytical method and critic of knowledge in Cytology and Genetics and related areas.
1.4. Use Cytological and Genetical knowledge combined with related knowledge to find innovative solutions for professional problems.
1.5. Mastery of a wide range of professional skills in Cytology and Genetics and development of methods and tools, and new techniques in professional practice.
1.6. Communicate effectively and have the ability to lead teams and make decisions in light of available information.
1.7. Use available resources to achieve the highest benefit of the environment and be aware of our roles in community development and preservation of our environment.
1.8. Behave in a manner reflecting the commitment to integrity and credibility of the profession and abide by the rules.

2. Intended Learning Outcomes (ILO's)

2.1. Knowledge and Understanding

By the end of the Ph.D. in Cytology and Genetics program graduates must be able to know and understand the followings:

2.1.1 Theories and fundamentals and modern knowledge in cytology and genetics and related sciences in botany.

2.1.2. The basics and ethics of the scientific research in cytology and genetics.

2.1.3. Legal and ethical principles for professional practice in cytology and genetics.

2.1.4. Principles and fundamentals of quality in professional practice in cytology and genetics.

2.1.5. Knowledge related to the effects of professional practice on the environment and society and ways of development and preservation of the environment.

2.2 Intellectual Skills

By the end of the Ph.D. in cytology and genetics program graduates must be able to:

2.2.1. Analyze and evaluate the information in cytology and genetics and related sciences in botany.

2.2.2. Interpret and correlate data for solve problems in cytology and genetics and related sciences in botany.

2.2.3. Develop research study which contributes to add the knowledge in cytology and genetics and related sciences in botany.

2.2.4. Formulate scientific research in cytology and genetics.

2.2.5. Evaluate risks during the professional practice in cytology and genetics.

2.2.6. Plan and innovate for the development of performance in cytology and genetics.

2.2.7. Make professional decisions in professional practices in cytology and genetics.

2.2.8. Make discussions based on evidences and conclusions in cytology and genetics and related sciences in botany.

2.3. Professional and Practical Skills

By the end of the Ph.D. in Cytology and Genetics program graduates must be able to:

2.3.1. Mastery of basic, professional and modern skills in the field of Cytology and Genetics.
2.3.2. Writing and evaluation of professional reports in cytology and genetics and related sciences in botany.
2.3.3. Evaluate and develop methodology and techniques in cytology and genetics and related sciences in botany.
2.3.4. Use technological means to serve the professional practice in cytology and genetics.
2.3.5. Planning for the development of professional practice and development of the performance of others.

2.4. General Skills and Transition

By the end of the Ph.D. in Cytology and Genetics program graduates must be able to:

2.4.1. Communicate effectively by using different methods.
2.4.2. Use information technology to develop professional practice and to obtain information and knowledge.
2.4.3. Teach others and evaluate their performance during laboratory works.
2.4.4. Self-evaluation and continuous learning.
2.4.5. Work in a team and lead working groups.
2.4.6. Manage scientific meetings and be able to manage time.

3. Academic standards of the program

The Academic Reference Standards (ARS) of this program is based upon the Standard Criteria for Postgraduate Programs published by the National Authority of Quality Assurance and Accreditation of Education in (2009). Specific Academic Reference Standards for Ph.D. in Botany were approved by the Council of Faculty of Science, Benha University in --/--/2015 (**Appendices 1, 2, 3, 4, 5 and 6**).

4. Reference indices (Benchmarks)

Not utilized.

5. Program structure and contents

5.1. Program duration: 3-5 years.
5.2. Program structure:

Program structure	Credit hours/week
Optional courses	**12**
Research and preparing the Ph.D. thesis	**48**
Total	**60**

5.3. Program Courses:

5.3.1. Optional courses:

Code No.	Course Title	No. of hours		
		Lectures	Practical	Credit hours
The graduate studies (12 hours)				
708 B	Advanced molecular biology	3	-	3
706 B	Genetic bases of plant physiology	3	-	3
709 B	Biology of cancerous tumors	3	-	3
710 B	Bioinformatics (2)	3	-	3
711 B	Specialized topics	3	-	3
712 B	Protoplast culture and fusion	3	-	3
48 credit hours for research and preparing the PhD thesis				
799 B	Doctoral thesis	-	-	48

6. Contents of the Courses

See course specification (**Appendix 7 and 8**)

7. Program admission requirements

١. يشترط لقيد الطالب لنيل درجة دكتوراه الفلسفة في العلوم أن يكون حاصلا على درجة ماجستير في العلوم في نفس التخصص من كلية العلوم جامعة بنها أو أى درجة معادلة لها من معهد علمي أخر معترف به من المجلس الأعلى للجامعات.

٢. المدة اللازمة للحصول على درجة دكتوراه الفلسفة في العلوم ثلاث سنوات على الأقل منذ موافقة الجامعة علي التسجيل، وبحد أقصي خمس سنوات (المدة الأساسية) ويمكن مد

التسجيل لمدة استثنائية لا تزيد عن ثلاث سنوات بناءا على التقارير العلمية المقدمة من لجنة الأشرف وموافقة مجلس القسم العلمي المختص ولجنة الدراسات العليا والبحوث ومجلس الكلية ومجلس الدراسات العليا والبحوث بالجامعة.

٣. يشترط لتسجيل الطالب لدرجة دكتوراه الفلسفة في العلوم اجتياز امتحان اتقان اللغة الانجليزية او ما يعادلها بمستوى يحدده مجلس الجامعة وكذلك استيفاء أى شروط أضافية تراها الكلية والجامعة لازمة للقيد والتسجيل للدرجة.

8. Regulations for progression and program completion:

١. أن ينجز الطالب عدد ١٢ ساعة دراسية معتمدة من المقررات الدراسية لمرحلة ما بعد الماجستير متزامنة مع التسجيل للرسالة العلمية (تحسب ٤٨ ساعة معتمدة) ويخصص لكل ساعة معتمدة خمسون درجة.

٢. يقوم الطالب باجراء مناقشة علنية لخطة البحث (سيمينار) على أن يوافق عليها مجلس القسم تمهيدا لتسجيله للدرجة.

٣. تعقد امتحانات الدراسة الخاصة بالدكتوراه في نهاية كل فصل دراسي في المواعيد التي يقرها مجلس الكلية بناءً علي اقتراح مجالس الأقسام.

٤. يقوم الطالب باجراء بحث ذا قيمة علمية تمثل إضافة علمية جديدة قائمة علي البحث المبتكر في موضوع يقره مجلس القسم ولجنة الدراسات العليا و مجلس الكلية ومجلس الدراسات العليا بالجامعة على أن يقدم الطالب نتائج بحثه في رسالة تقبلها لجنة الحكم، و يقوم الطالب بعمل سيمينار قبل التقدم بالرسالة بثلاثة اشهر علي الأقل.

٥. يمنح الطالب درجة دكتوراه الفلسفة في العلوم ويذكر في الشهادة التخصص العام والدقيق وعنوان الرسالة.

٦. يرجع للائحة التنفيذية لقانون تنظيم الجامعات فيما لم يرد به نص في هذه اللائحة.

9. Methods and rules of evaluation of graduates enrolled in the program:

9.1. Theoretical courses:

Method of Assessment	Percent
Semester work & mid Term Exam	10%
Oral Exam	10%
Final Term Examination	80%
Total	100%

9.2. Doctorate Thesis evaluation:

- The senior supervisor reports.
- Individual Reports of the Judge Committee
   (Three specialist professors including the senior supervisor).
- The Public Discussion
- The Common Report of the Judge Committee.
- Department, Faculty and University Boards.

   • Assessment Recommendations:
   -The Judge Committee has to recommend one of the following:
   - Accepting the thesis as it is.
   - Accept the thesis and recommends awarding after correction performing.
   - Delaying awarding for maximum three months to perform corrections.
   - Re-displaying the thesis to the judge committee within limited period.
   - Rejecting the thesis at all.

10. Teaching and learning strategies used in the program:
10.1. Direct teaching strategy.
10.2. Cooperative learning strategy.
10.3. Brainstorming strategy.
10.4. Problem-solving strategy.
10.5. Effective discussion strategy.
10.6. Independent Study strategy.

11. Methods of program evaluation: (Appendix 9)

Samples	Tool
1- Senior Students	Questionnaire
2- Alumni	Questionnaire
3- External Evaluators	Reports
4- Stakeholders	Questionnaire, workshops, seminars, conferences

Head of the department: Prof. Dr. Mahmoud Moustafa Amer

Date: 2014 / 2015

DOCTOR Ecology, Taxonomy, Flora Program
PROGRAM SPECIFICATION

Program Specification

A. Basic Information

Program Title: Pre-doctor of Ecology, Taxonomy, Flora Program
Program Type: Single
Department: Botany
Coordinator:
Assistant Co-ordinator: Dr Dina Baraka, Dr Reyad Elsharkawy
Dates of program specifications approval: 14/11/2015

B. Professional Information

1. Program Aims to

a)   prepare the students to carry out scientific research in different areas of plant science (Ecology, Taxonomy, Flora Program), aiming either to pursue for a M. Sc degree , or to work in the research development divisions of industrial companies, pharmatheotical agents, medical centers and diagnostic laboratories for pathogenic agents to plants, human and animals, water purification and treatment industrial agents ,environmental agent and physiology of microorgnaisms.

b)   Understand the external and internal structure of the different microorganisms, focusing on understanding their behavior, biology in different habitat.

c)   Equip the students with traditional techniques and recent trends in modern techniques in the fielded of plant sciences (Ecology, Taxonomy, Flora Program) applied to plants, human, animals, environment, industry, pharmatheotical and medical sectors.

d)   Utilize the conventional and methodologies in the areas of diagnostics,detection, identification of the causal agents of the dieses of concern locally and globally , industrial applications i.e. food – based industry, drug based industry , vaccines , diagnostics, bioremediation and water purification.

e)   Know how to adapt the data in a coherent fashion (in a multidisplinary base and interdisplinary base)

f)   Identifiy actinomycetes, method of isolation and identification, classification, physiological characteristics and its economic importance.

g)   Provide students with a broad and balanced foundation of knowledge and practical skills in all of Ecology, Taxonomy, Flora Program and other subjects.

h)   Provide the necessary skills and training for further study or research in pure Ecology, Taxonomy, Flora Program.

2. Intended Learning Outcomes (ILO's)

a. Knowledge and Understanding

By the end of the master's program in pure Ecology, Taxonomy, Flora Program graduate must be able to:

a1.   memorize the ecological systems and of the interrelationships between organisms and the environment they live in focussing on population processes, dynamics and interactions; community structure development and biodiversity; ecological methodologies and data analyses; the impact of different approaches to species management and conservation; nutrient and energy flow through populations and communities;

a2.   outline of the evolutionary processes that give rise to the diversity and complexity of life;

a3.   Record cutting edge developments in a range of areas specific to the subject;

a4.   locate with philosophical and ethical issues arising from some of the current developments in the biosciences;

b. Intellectual Skills

By the end of the master's program in pure Ecology, Taxonomy, Flora Program graduate must be able to:

b1.   solve problems and find solutions.

b2.   apply the correct methods for studying of microorganisms

b3.   interpret the differences between world of microorganisms

b4.   confirm the relations between human, animal, plant, and microorganisms.

b5.   create a good handling in practical applied Ecology, Taxonomy, Flora Program research work.

c. Professional and Practical Skills

By the end of the master's program in pure Ecology, Taxonomy, Flora Program graduate must be able to:

C1. Show the ability to employ and evaluate suitable experimental methods (both laboratory and fieldwork based) for the investigation of relevant areas of biology;

C2. a range of laboratory and fieldwork techniques of key importance in biology;

C3. examine safely in a scientific laboratory and in the field, with awareness of standard safety protocols; the ability to apply relevant numerical skills, including statistics to biological data; the ability to access bioscience information from a wide range of sources in order to maintain and enhance knowledge of the Biosciences and to communicate that information clearly in oral and written forms; assessing the merits of contrasting subject-specific theories, paradigms, concepts and principles; critically interpreting and evaluating experimental data and relevant literature, analysing and solving problems, and decision-making; applying subject-specific knowledge and understanding to address familiar and unfamiliar problems; the ability to plan, design and execute an independent piece of research through a theoretical or practical project in environmental biology, including the production of the final report; taking personal responsibility for learning, and developing habits of reflection on that learning;

C4. dentifying, retrieving (including the use of online computer searches), sorting and exchanging information; abstracting and synthesising information, and developing a reasoned argument; written communication and verbal presentation; information technology (including spreadsheets, databases, word processing, email and WWW); interpersonal skills, including working in groups/teams and recognising and respecting the viewpoints of others

d. General Skills

By the end of the master's program in pure Ecology, Taxonomy, Flora Program graduate must be able to:

d1. Interpret the information, discuss and communicate ideas effectively both orally and in writing using a range of formats.
d2. Use of information technology to serve the development of Ecology, Taxonomy, Flora Program.
d3. Self-evaluation and ability to identify personal learning needs.
d4. Use different sources for information and knowledge in Ecology, Taxonomy, Flora Program.
d5. Assess the relevance and importance of ideas of others.

d6. Evaluate own performance and working standards and those of others.

3- Academic standards of the program

The Academic Reference Standards (ARS) of this program compile with the Standard Criteria for Postgraduate Programs published by the National Authority of Quality Assurance and Accreditation of Education in (2009). Specific Academic Reference Standards for Doctorin Ecology, Taxonomy, Flora Program were approved by the Council of Faculty of Science, Benha University in --/--/2015 (**Appendices 1, 2, 3, 4, 5 and 6**).

4- Reference indices (Benchmarks)

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5- Curricullum structure and contents of program

a- Program duration: 2 years

b- Program structure:

- 15 compulsory credit hours.
- 9 elective credit hours.
- 24 credit hours for the preparation of final thesis.
- Total crd hrs. 48

d- Program Courses:

Compulsory courses:

No.	Code No.	Course Title	No. of hours		
			Lectures	Practical	Credit hours
1	713B	Dangerous elements of vegetation	2	-	2
2	714B	Modern Ecological Topics	2	-	2
3	715B	Plant- plant relationships	2	-	2
4	716B	Genesis and development of angiosperms	1	2	2
5	718B	Biostatistics	1	2	2
6	719B	plant taxonomy	1	2	2
7	720B	Palynology	2	-	2
8	721B	Resources and plant protection	2	-	2
9	799B	doctor Research thesis	48	-	-

6- Contents of the Courses

See course specification (**Appendix 7 and 8**)

7- Program admission requirements

Admission is achieved on the basis of:
- Completion of a B.Sc. degree or any equivalent Arabic or international certificate.
- Passing the TOFEL test with the score determined by the University Council.
- Meeting any additional conditions the college and university deems necessary to register for the Doctordegree.

8- Regulations for progression and program completion:

- According to the law of Benha Faculty of Science - the regulations for progression and program completion - the graduate must pass:
    - 15 compulsory credit hours.
    - 9 elective credit hours.
    - 24 credit hours for preparing the DoctorThesis.
- 3 computer courses.
- 2 seminars approved by Department Council.
- Student is considered absent, if he/she misses the final written exam with no acceptable excuse.

9- Methods and rules of evaluation of students in rolled in the program:
- **Courses evaluation**:

	Method of Assessment	Percent
1	Final Oral Exam	14%
2	Mid-term Exam	14%
3	Practical Exam	24%
2-	Final Term Examination	48%
	Total	100%

- **Master's Thesis evaluation**:
    5-1. The senior supervisor reports.

5-2. Individual Reports of the Judging Committee (Three specialist professors including the senior supervisor).

5-3. The Public Discussion

5-4. The Common Report of the Judging Committee.

5-5. Department, Faculty and University Boards.

- Assessment Recommendations:

-The Judging Committee has to recommend one of the following:

- Accepting the thesis as it is.
- Accepting the thesis and recommends awarding after correction performing.
- Delaying awarding for maximum three months to perform corrections.
- Re-displaying the thesis to the judging committee within limited period.
- Rejecting the thesis at all.

10- Methods of program evaluation:

Samples	Tool
1- Senior Students	Questionnaire
2- Alumni	Questionnaire
3- External Evaluators	Reports
4- Stakeholders	Questionnaire, workshops, seminars, conferences

Head of the Department: Prof. Dr. Mahmoud Amer
Program coordinator: Dr Dina Baraka, Dr Reyad Elsharkawy
Date: 2015/2016

Microbiology
Doctoral Program
Specification

Microbiology Doctoral Program Specification

A. Basic Information

Program Title: Microbiology Doctoral Program
Program Type: Single
Department: Botany Departement
Coordinators: **Dr. Mohamed Othman**
                                     Dr. Mohammed A. Nasr-Eldin

Dates of program specifications approval: 11/05/2011

B. Professional Information

1. Program Aims

The microbiology program is an academic program produced by botany Department. It is goal-oriented, focused, research experience, community service, and development of important personal characteristics of the postgraduated students. The program aims to prepare the students to carry out scientific research in different areas of Microbiology, aiming either to pursue for a Ph. D degree, or to work in the research development divisions of industrial companies, pharmatheotical agents, medical centers and diagnostic laboratories for pathogenic agents to plants, human and animals, water purification and treatment industrial agents and environmental agents.

By the end of the Ph.D. in Microbiology program graduates must be able to:

1.1   Acquire the required baseline knowledge and advanced science courses to competitively apply to microbiology fields.
1.2   Understand the external and internal structure of the different microorganisms, focusing on understanding their behavior, biology in different habitat. Modification and adaptation of each microbe with its habitat. Study the microbial biology (Viroids, Viruses, Rickettsia, Fungi, Bacteria, Algae and general information about microbial relationships, microbial enzymes, as well as introduction to microbial biodiversity.
1.3   Equipped the students with traditional techniques and recent trends in modern techniques in the fielded of (Microbiology) applied to plants, human, animals, environment, industry, pharmatheotical and medical sectors. Utilizing the conventional and methodologies in the areas of diagnostics, detection, identification of the causal agents of the dieses of concern locally, industrial applications

2

1.4   Mastery of a wide range of professional skills in Microbiology and development of methods and tools, and new techniques in professional practice.

1.5   Show awareness of ongoing problems and visions in modern field of Microbiology.

1.6   Communicate effectively and have the ability to lead teams and make decisions in light of available information.

1.7   Use available resources to achieve the highest benefit and preservation of the environment.

1.8   Show awareness of his/her role in community development and preservation of the environment.

1.9   Behave in a manner reflecting the commitment to integrity and credibility of the profession and abide by the rules.

2. Intended Learning Outcomes (ILO's)

2.1 Knowledge and Understanding

By the end of the Ph.D. in Microbiology program graduates must be able to:

2.1.1   Understand the basic concepts related to microbial biology, population dynamics, pathogenesis of microbial pathogens, and the nature of the interaction between the microbes with their habitat at local and global levels. Understand the bases of the traditional and molecular based techniques for identification, characterization and detection of the microbial agent (either single or in a complex) *in vitro* and *in vivo* (that is divergent biological systems such as plants, fungi, bacteria, viruses, viroids mycoplasma, phytoplasma, ricktesia, algae.

2.1.2   Discover new techniques and different types of analysis data.

2.1.3   Understand the principles of quality in the professional practice in Microbiology.

2.1.4   Know the current issues of Microbiology research and technological development.

2.1.5   Understand the metabolic kinetics of the microbial agents and their utilization for industrial products; understand the concepts of bioremediation and its application in the environment.

2.1.6   Determine the role of microorganisms medicine, Identify the immunity and immune system, characterize the antigens

2.2 Intellectual Skills

By the end of the Ph.D. in Microbiology program graduates must be able to:

2.2.1   Analyze the information in the field of applied microbiology

2.2.2   Interpret and correlate data for solve problems in Microbiology and related sciences in Botany data.

2.2.3   Develop research study which contributes to add the knowledge in Microbiology and related sciences in Botany

2.2.4   Planning and innovation for the development of performance in Microbiology

3

2.2.5   Formulate scientific research in the field of applied Microbiology.

2.2.6   Interpret the differences between world of microorganisms

2.2.7   Evaluate risks during the professional practice in diferent branches of Microbioogy

2.2.8   Make professional decisions in professional practices in Microbiology and discussion based on evidences and conclusions in some microbiology branches and related sciences in Botany

2.3 Professional and Practical Skills

By the end of the Ph.D. in Microbiology program graduates must be able to:

2.3.1   Apply perfectly the bases and modern professional skills in applied microbiology.

2.3.2   Assess risk in laboratory work taking into consideration the specific hazards associated with the use of microbes as well as the more safty and proper operation of the laboratory techniques.

2.3.3   Writing and evaluation of professional reports in Microbiology and related sciences in Botany, use instruments with accuracy in experimental data.

2.3.4   Label different methodology and techniques in Microbiology and related sciences in Botany

2.3.5   Use technological means to serve the professional practice Microbiology.

2.3.6   Planning for the development of professional practice and development of the performance of others.

2.4 General Skills

By the end of the Ph.D. in Microbiology program graduates must be able to:

2.4.1   Communicate effectively by using different methods.

2.4.2   Use of information technology to development of professional practice and to obtain information and knowledge.

2.4.3   Teach others and evaluate their performance during laboratory works

2.4.4   Self-evaluation and continuous learning.

2.4.5   Work in a team and lead working groups.

2.4.6   Management of scientific meetings and the ability to manage time.

3- Academic standards of the program

The Academic Reference Standards (ARS) of this program is based upon the Standard Criteria for Postgraduate Programs published by the National Authority of Quality Assurance and Accreditation of Education in (2009). Specific Academic Reference Standards for Ph.D. in Microbiology approved by the Council of Faculty of Science, Benha University in / /2015 (**Appendices 1, 2, 3, 4, 5 and 6**).

4- Reference indices (Benchmarks)
   Not utilized.
5- Curricullum structure and contents of program
   a- Program duration: 3-5 years.
   b- Program structure:

Program structure	Credit hours/week
Optional courses	12
Research and preparing the Ph.D. thesis	48
Total	60

c- Program Courses:
   - **Optional courses**

   The student studies (12 credit hours)

Code No.	Course Title	No. of Units	Lect.	Exer.	Prac.
722 B	Bioinformatics	3	3	-	-
723 B	Microbial diversity	3	3	-	-
724 B	Advanced Molecular Virology	3	3	-	-
725 B	Medical Microbiology	3	3	-	-
726 B	Immunology	3	3	-	-
727 B	Bioremidration and microbial enzymes in the Environment	3	3	-	-
728 B	Scientific designs and data analysis	3	3	-	-
729 B	Food Spoilage and risk analysis for control points	3	3	-	-
730 B	Antibiotics and Natural Alternatives	3	3	-	-
731 B	Advanced applied Microbiology	3	3	-	-
732 B	Biological Control	3	3	-	-
733 B	Tissue culture	3	3	-	-
734 B	Yeast Technology	3	3	-	-

| 799 B | Ph. D. Research thesis | 48 | | | |

6- Contents of the Courses
See course specification (**Appendix 7 and 8**)

7. Program admission requirements

١. يشترط لقيد الطالب لنيل درجة دكتوراه الفلسفة في العلوم أن يكون حاصلا على درجة ماجستير في العلوم في نفس التخصص من كلية العلوم جامعة بنها أو أى درجة معادلة لها من معهد علمي أخر معترف به من المجلس الأعلى للجامعات.

٢. المدة اللازمة للحصول على درجة دكتوراه الفلسفة في العلوم ثلاث سنوات على الأقل منذ موافقة الجامعة علي التسجيل، وبحد أقصي خمس سنوات (المدة الأساسية) ويمكن مد التسجيل لمدة استثنائية لا تزيد عن ثلاث سنوات بناءا على التقارير العلمية المقدمة من لجنة الأشرف وموافقة مجلس القسم العلمي المختص ولجنة الدراسات العليا والبحوث ومجلس الكلية ومجلس الدراسات العليا والبحوث بالجامعة.

٣. يشترط لتسجيل الطالب لدرجة دكتوراه الفلسفة في العلوم اجتياز امتحان اتقان اللغة الانجليزية او ما يعادلها بمستوى يحدده مجلس الجامعة وكذلك استيفاء أى شروط أضافية تراها الكلية والجامعة لازمة للقيد والتسجيل للدرجة.

8. Regulations for progression and program completion:

١. أن ينجز الطالب عدد ١٢ ساعة دراسية معتمدة من المقررات الدراسية لمرحلة ما بعد الماجستير متزامنة مع التسجيل للرسالة العلمية (تحسب ٤٨ ساعة معتمدة) ويخصص لكل ساعة معتمدة خمسون درجة.

٢. يقوم الطالب باجراء مناقشة علنية لخطة البحث (سيمينار) على أن يوافق عليها مجلس القسم تمهيدا لتسجيله للدرجة.

٣. تعقد امتحانات الدراسة الخاصة بالدكتوراه في نهاية كل فصل دراسي في المواعيد التي يقرها مجلس الكلية بناءً علي اقتراح مجالس الأقسام.

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٦. يرجع للائحة التنفيذية لقانون تنظيم الجامعات فيما لم يرد به نص في هذه اللائحة.

9. Methods and rules of evaluation of graduates enrolled in the program:

9.1. Theoretical courses:

Method of Assessment	Percent
Semester work & mid Term Exam	10%
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9.2. Doctorate Thesis evaluation:

- The senior supervisor reports.

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  (Three specialist professors including the senior supervisor).
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11. Methods of program evaluation: (Appendix 9)

Samples	Tool
1- Senior Students	Questionnaire
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3- External Evaluators	Reports
4- Stakeholders	Questionnaire, workshops, seminars, conferences

Head of the department: Prof. Dr. Mahmoud Mostafa Amer

Date: / 2015

Ph.D. in Plant Physiology Program

A. Basic Information

Program Title: Ph.D. in Plant Physiology Program
Program Type: Major
Department: Botany
Coordinator: Dr. Mahmoud Abderraouf Elshafey
Assistant Co-ordinator: Dr. Mohammad Othman Abdelmonem
Dates of program specifications approval: 11/5/2011

B. Professional Information

1. Program Aims

By the end of the Ph.D. in Plant Physiology program graduates must be able to:

1.1. Demonstrate proficiency in the application of basics and methodologies of scientific research in Plant Physiology and be able to develop methods and tools and new techniques.

1.2. Commitment to continuing self learning with work on the addendum to the knowledge in Plant Physiology with the awareness of ongoing problems and visions, and transfer of knowledge and expertise to others.

1.3. Apply the analytical method and critic of knowledge in Plant Physiology and related areas.

1.4. Use physiological knowledge combined with related knowledge to find innovative solutions for professional problems.

1.5. Mastery of a wide range of professional skills in Plant Physiology and development of methods and tools, and new techniques in professional practice.

1.6. Communicate effectively and have the ability to lead teams and make decisions in light of available information.

1.7. Use available resources to achieve the highest benefit of the environment and be aware of our roles in community development and preservation of our environment.

1.8. Behave in a manner reflecting the commitment to integrity and credibility of the profession and abide by the rules.

2. Intended Learning Outcomes (ILO's)

2.1. Knowledge and Understanding
By the end of the Ph.D. in Plant Physiology program graduates must be able to know and understand the followings:

2.1.1   Theories and fundamentals and modern knowledge in Plant Physiology and related sciences in botany.
2.1.2. The basics and ethics of the scientific research in Plant Physiology.
2.1.3. Legal and ethical principles for professional practice in Plant Physiology.
2.1.4. Principles and fundamentals of quality in professional practice in Plant Physiology.
2.1.5. Knowledge related to the effects of professional practice on the environment and society and ways of development and preservation of the environment.

2.2 Intellectual Skills
By the end of the Ph.D. in Plant Physiology program graduates must be able to:

2.2.1. Analyze and evaluate the information in plant physiology and related sciences in botany.
2.2.2. Interpret and correlate data for solve problems in plant physiology and related sciences in botany.
2.2.3. Develop research study which contributes to add the knowledge in plant physiology and related sciences in botany.
2.2.4. Formulate scientific research in plant physiology.
2.2.5. Evaluate risks during the professional practice in plant physiology.
2.2.6. Plan and innovate for the development of performance in plant physiology.
2.2.7. Make professional decisions in professional practices in plant physiology.
2.2.8. Make discussions based on evidences and conclusions in plant physiology and related sciences in botany.

2.3. Professional and Practical Skills

By the end of the Ph.D. in Plant Physiology program graduates must be able to:

2.3.1. Mastery of basic, professional and modern skills in the field of plant physiology.
2.3.2. Writing and evaluation of professional reports in plant physiology and related sciences in botany.
2.3.3. Evaluate and develop methodology and techniques in plant physiology and related sciences in botany.
2.3.4. Use technological means to serve the professional practice in plant physiology.
2.3.5. Planning for the development of professional practice and development of the performance of others.

2.4. General Skills and Transition

By the end of the Ph.D. in Plant Physiology program graduates must be able to:

2.4.1. Communicate effectively by using different methods.
2.4.2. Use information technology to develop professional practice and to obtain information and knowledge.
2.4.3. Teach others and evaluate their performance during laboratory works.
2.4.4. Self-evaluation and continuous learning.
2.4.5. Work in a team and lead working groups.
2.4.6. Manage scientific meetings and be able to manage time.

3. Academic standards of the program

The Academic Reference Standards (ARS) of this program is based upon the Standard Criteria for Postgraduate Programs published by the National Authority of Quality Assurance and Accreditation of Education in (2009). Specific Academic Reference Standards for Ph.D. in Botany were approved by the Council of Faculty of Science, Benha University in --/--/2015 (**Appendices 1, 2, 3, 4, 5 and 6**).

4. Reference indices (Benchmarks)

Not utilized.

5. Program structure and contents

5.1. Program duration: 3-5 years.

5.2. Program structure:

Program structure	Credit hours/week
Optional courses	**12**
Research and preparing the Ph.D. thesis	**48**
Total	**60**

5.3. Program Courses:

5.3.1. Optional courses:

Code No.	Course Title	No. of hours		
		Lectures	Practical	Credit hours
The graduate studies (12 hours)				
701 B	Biochemical adaptation to physiological stresses.	2	-	2
702 B	Regulation of metabolic processes in plants.	2	-	2
703 B	Mechanism of photosynthesis.	3	-	3
704 B	Advanced studies on phytohormones and growth regulators.	3	-	3
705 B	Growth and development.	3	-	3
706 B	Genetic bases of plant physiology.	2	-	2
707 B	Translocation in the phloem.	2	-	2
708 B	Advanced molecular biology.	3	-	3
48 credit hours for research and preparing the PhD thesis				
799 B	Doctoral thesis	-	-	48

6. Contents of the Courses

See course specification (**Appendix 7 and 8**)

7. Program admission requirements

١. يشترط لقيد الطالب لنيل درجة دكتوراه الفلسفة في العلوم أن يكون حاصلا على درجة ماجستير في العلوم في نفس التخصص من كلية العلوم جامعة بنها أو أى درجة معادلة لها من معهد علمي أخر معترف به من المجلس الأعلى للجامعات.

٢. المدة اللازمة للحصول على درجة دكتوراه الفلسفة في العلوم ثلاث سنوات على الأقل منذ موافقة الجامعة علي التسجيل، وبحد أقصي خمس سنوات (المدة الأساسية) ويمكن مد التسجيل لمدة استثنائية لا تزيد عن ثلاث سنوات بناءا على التقارير العلمية المقدمة من لجنة الأشرف وموافقة مجلس القسم العلمي المختص ولجنة الدراسات العليا والبحوث ومجلس الكلية ومجلس الدراسات العليا والبحوث بالجامعة.

٣. يشترط لتسجيل الطالب لدرجة دكتوراه الفلسفة في العلوم اجتياز امتحان اتقان اللغة الانجليزية او ما يعادلها بمستوى يحدده مجلس الجامعة وكذلك استيفاء أى شروط أضافية تراها الكلية والجامعة لازمة للقيد والتسجيل للدرجة.

8. Regulations for progression and program completion:

١. أن ينجز الطالب عدد ١٢ ساعة دراسية معتمدة من المقررات الدراسية لمرحلة ما بعد الماجستيرمتزامنة مع التسجيل للرسالة العلمية (تحسب ٤٨ ساعة معتمدة) ويخصص لكل ساعة معتمدة خمسون درجة.

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Head of the department: Prof. Dr. Mahmoud Moustafa Amer

Date: **2014 / 2015**