<table>
<tr><td>Module name:</td><td>Embryology</td></tr>
<tr><td>Module level, if applicable</td><td>7th level</td></tr>
<tr><td>Code, if applicable</td><td>ZOO 411</td></tr>
<tr><td>Subtitle, if applicable</td><td></td></tr>
<tr><td>Courses, if applicable</td><td>Embryology</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>1 semesters</td></tr>
<tr><td>Person responsible for the module</td><td>Dr. Zeinab Mohammed Saleh</td></tr>
<tr><td>Lecturer</td><td>Dr. Zeinab Mohammed Saleh</td></tr>
<tr><td>Language</td><td>Arabic</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory course for biology program</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Contact hours:58
Lecture:28
Practical :30
Additional learning hours (Self-Study e-learning, research paper, assignment) : 70
Class size:10 students.</td></tr>
<tr><td>Workload</td><td><table><tr><td>Total-contact hours</td><td>Self-study</td><td>Discussion</td><td>Total workload</td></tr><tr><td>58</td><td>70</td><td>10</td><td>138</td></tr></table></td></tr>
<tr><td>Credit points</td><td>4.7 ECTs-3KSA</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>To attend more than 75% of lecture and practical study</td></tr>
<tr><td>Recommended prerequisites</td><td>Comparative animal anatomy ZOO 322</td></tr>
</table>

Module objectives/intended learning outcomes	**Knowledge: the students are able to :** ***1-*** *Illustrate the histological structure of the gonads and gametogenesis (spermatogenesis – oogenesis) in some vertebrates* **2- Cognitive Skills: the students are able to :** ***1-*** *Explain the stages of embryonic development (cleavage - gastrulation - and organization) in each of the Amphioxus, frog, chicken and mammals.* ***2-*** *Compare the structure blastula –gastrula and neurula of each Amphioxus, frog, chicken, mammals explaining the reasons of the difference* **3-Interpersonal Skills & Responsibility: the students are able to :** *Perfects the skill of self-learning and take responsibility and participate in group discussions and accept the opinions of others* **4-Communication, Information Technology, Numerical: the students are able to:** *Perfects the skill of using modern technology to increase the knowledge and preparation of research paper* **5-Psychomotor: the students are able to:** 1- *Mastered examination of various sectors and models of the embryonic stages for each of the Amphioxus frog, chicken* 2- *Draw sections in deferent embryonic stages of before mentioned animals with writing a correct conclusion*

content	

List of Topics	NO.of Weeks	Contact Hrs.	%of content
1-Introduction to Embryology, development of the embryonic gonads and histological structure of mature gonads in each of the frog, bird and mammals.	2	8	13.79
gametogenesis (spermatogenesis and oogenesis) in addition to fertilization steps	2	8	13.79
Types of ova in deferent chordates -cleavage and blastocyst formation in a Amphioxus	1	4	6.89
Midterm 1+ feedback	1	3	5.17
cleavage and blastocyst formation in frog, chicken – and placental mammals	2	8	13.79
Gastrulation and formation of the three embryonic layers (ectoderm-mesoderm and endoderm) , the neural tube , notochord in each of the following, Amphioxus ,frog	2	8	13.79
Midterm 2+ feedback	1	3	5.17
Further development of blastocyst in chicken and placental mammals to form trilaminar embryonic disk, neural tube and notochord	2	8	13.79
Structure and functions of extra embryonic membranes in both birds and mammals - formation and types of the placenta in placental mammals.	2	8	13.79

The description should clearly indicate the weighting of the content and the level.

Study and examination requirements and forms of examination	*20 degrees for two Midterm exams* *10 degrees for assignments, Class work and reseach* *50 degrees for final theoretical Exam* *20 degrees for final practical Exam*
Media employed	*classroom provided with smartboard , computer , internet connection and enough seats* *Lab provided with the required devices , light microscopes and models for application of the practical part of the course*

Reading list	• ١- مقدمة في علم الأجنة للفقاريات- إبراهيم ،ماهر محمد عمادة شؤون المكتبات جامعة الملك سعود – الرياض (١٩٨٧م) *1- Ibrahim, M.M.(1987)). Introduction in embryology of vertebrates. Deanship of Library Affairs, King Saud University - Riyadh* • ٢- الأساسيات في عملي أجنة الفقاريات الوصفي و التجريبي –الحميدي ،احمد راشد عثمان عبد الله الدوخى و محمد حامد الغندور – جامعة الملك سعود – الرياض (١٩٩٨م). *2- Al Himidi, A.R., Al Dokhi,O, A and El Ghandour M .h (1998) Basics in practical vertebrate embryos descriptive and experimental - King Saud University - Riyadh* • ٣- التكاثر في الثدييات الخلايا التناسلية و الإخصاب – أوستن ،س.ر.ر. ف شورت ترجمة احمد بن راشد الحميدي و فيصل محمد أبو طربوش –جامعة الملك سعود (١٩٩٧م) *3-Austin, S.R and Short R. F. (1997) Reproduction in mammals germ cells and fertilization – translation By Al Hamidi A.R. and Faisal Mohammed Abu Tarbush F.M. King Saud University* • ٤- بيولوجية الحيوان العملية الجزء الأول الحسيني ، احمد حماد و إميل شنودة دميان أخر طبعة دار المعارف – القاهرة (٢٠٠٢م) *4- Al Husseini, A. H. and Demian E. S (2002). Practical Animal Biology. Part 1 last edition Dar Al-Maaref- Cairo* ٥- المدخل إلي علم الأجنة الوصفي و التجريبي –كريم ،صالح عبد العزيز – دار المجتمع – جدة (١٩٩٠م) *5. Karim, S. A. (1990). The entrance to descriptive and experimental embryology - Dar AL Mojtamaa- Jeddah*

<table>
<tr><td>Module name:</td><td>Parasitology</td></tr>
<tr><td>Module level, if applicable</td><td>7th level</td></tr>
<tr><td>Code, if applicable</td><td>ZOO 412</td></tr>
<tr><td>Subtitle, if applicable</td><td>NA</td></tr>
<tr><td>Courses, if applicable</td><td>NA</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>1st semester and 2nd semester</td></tr>
<tr><td>Person responsible for the module</td><td>Prof. Dr: Hala Ali Abdel Salam Saleh</td></tr>
<tr><td>Lecturer</td><td>Prof. Dr: Hala Ali Abdel Salam Saleh</td></tr>
<tr><td>Language</td><td>Arabic</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory course for biology program</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Total Contact hours/semester:58 hrs.
Lecture:28
Practical :30
-Class size for lecture:20-25 students
-Class size for Lab:10-17 students</td></tr>
<tr><td>Workload</td><td><table><tr><td>Total-contact hours</td><td>Self-study</td><td>Discussion</td><td>Total workload</td></tr><tr><td>58</td><td>65</td><td>20</td><td>143</td></tr></table></td></tr>
<tr><td>Credit points</td><td>4.9 ECTs- 3KSA.</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>To attend more than 75% of lecture and practical study</td></tr>
<tr><td>Recommended prerequisites</td><td>Animal Taxnomy ZOO,121</td></tr>
<tr><td>Module objectives/intended learning outcomes</td><td>Knowledge: the students are able to
Recognize taxonomy, environments and hosts of parasites
Determine the effects of parasitism on the host and disease caused by various parasites to hosts
Cognitive Skills: the students are able to
Compare between the different types of parasites and hosts.
Ilustrate the life cycle of different parasites
Interpersonal Skills & Responsibility: the students are able to
Work effectively in team in research presentations.
Communication, Information Technology, Numerical: the students are able to
Demonstrate the Preparation of research papers and presentations by using advanced technology in good manner
Psychomotor: the students are able to
Diagram life cycles of parasites through examination of exposed microscopic specimens</td></tr>
</table>

Content	**Content**	**Wks. No**	**Contact hours**	**%**
	-Biological study on the environment and the spread of parasites. studying the ways that follow by parasites in parasitism. The effects of parasitism on the host	1	4	6.90
	Biological, taxonomical, anatomical and pathological study on selected samples of important parasites that infect humans and animals include the following: 1-Subkingdom Protozoa: Entamoeba histolytica ,Entamoeba coli ، Entamoeba dispar Acanthamoeba sp. , Naegleria fowleri / Giardia lamblia ، Trichomonas vaginalis ،Trypanosoma sp. Leishmania sp Plasmodium sp, Balantidium coli ،Toxoplasma gondii.	5	20	34.48
	Mid Term+ Feedback	1	3	5.17
	-Phylum Platyhelminths : Fasciola gigantica ،Fasciola hepatica ، Schistosoma haematobium ,Schistosoma manoni ، Heterophyes heterophyes Dicrocolium denariticum saginata , Taenia solium ، Hymenolepis nana ، Echinococcus granulosus	3	12	20.69
	Phylum:Nematoda: Nematoda , Ascaris lumbricoides ,Entrobious vermicularis، ,Ancylostoma duedenale ، Trichinella spiralis Wchereia bancrofti	3	12	20.69
	Mid Term+ Feedback	1	3	5.17
	Brief study of the arthropods with medical and veterinary importance and its effect on man and domesticated animals such as : Anopheles ، Culex ، Musca domestica ,Phlebotomus , Fleas , Lice ,Hard ticks , Soft ticks ، Sarcoptes scabi	1	4	6.90
Study and examination requirements and forms of examination	20 degrees for two Midterm exams 10 degrees for homeworks, lab reports and reseach papers 20 degrees for final practical Exam 50 degrees for final theoretical Exam			
Media employed	classroom provided with smartboard , computer , internet connection and enough seats Lab provided with the required devices , light microscopes and models for application of the practical part of the course			

Reading list	- *Husseini, Ahmed Hammad and tend Shenouda Demian: practical animal biology* - *Shihawi, Mohammed Sadiq Arafa(1424H): Medical parasites and disease vectors.* - *Ruppert,Edward,E. and Robert,D., Barnes, 1994: Invertebrates zoology, 6thed. Stunders College publishing.* - *Dawit Assafa, Ephrem Kibru, S. Nagesh, Solomon Gebreselassie, Fetene Deribe, Jemal Ali (2004): Medical Parasitology..* - *Lynne S. Garcia (2006): Diagnostic Medical Parasitology.* - *Lynne S. Garcia (2006): Diagnostic Medical Parasitology* - *http://en.wikipedia.org/wiki parasitology*

<table>
<tr><td>Module name:</td><td>Phycology</td></tr>
<tr><td>Module level, if applicable</td><td>7th</td></tr>
<tr><td>Code, if applicable</td><td>BOT414</td></tr>
<tr><td>Subtitle, if applicable</td><td>NA</td></tr>
<tr><td>Courses, if applicable</td><td>NA</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>2nd semester</td></tr>
<tr><td>Person responsible for the module</td><td>dr: Jawaher AL ahiadeb</td></tr>
<tr><td>Lecturer</td><td>dr: Jawaher AL ahiadeb</td></tr>
<tr><td>Language</td><td>Arabic</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory course for biology program</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Total Contact hours/semester:58 hrs.
Lecture:28
Laboratory :30
Class size:21 students</td></tr>
<tr><td>Workload</td><td><table><tr><td>Total-contact hours</td><td>Self-study</td><td>Discussion</td><td>Total workload</td></tr><tr><td>58</td><td>64</td><td>18</td><td>140</td></tr></table></td></tr>
<tr><td>Credit points</td><td>4.8 ECTs-3KSA.</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>To attend more than 75% of lecture and practical study</td></tr>
<tr><td>Recommended prerequisites</td><td>none</td></tr>
</table>

Module objectives/intended learning outcomes	***1.0 Knowledge: the students are able to :*** Recognize the different sections of algae . Classified the algae relative to each other and within the plant kingdom. ***2.0 Cognitive Skills: the students are able to :*** Explores the information and draw conclusions Concludes different environment for algal species. ***3.0 Interpersonal Skills & Responsibility:the students are able to :*** Perfects the skill of self-learning and responsibility ***4.0Communication, Information Technology, Numerical:the students are able to:*** Use technology information in the research and writing proficiently. ***5.0Psychomotor:the students are able to:*** Examine microscopic samples with a detailed drawing of them.
Content	

List of Topics	No. of Weeks	Contact Hours	%
The definition and classification of algae.	**1**	**4**	***6.9 %***
-1 Types of algae that environmental Tamrha : fresh water algae , and algae water half the salt . Algae and salt water , giving a full explanation of the characteristics of these environments. **2-2 tints .** **2-3turkab vegetative .** **2-4 Methods of sexual reproduction and non- sexual**	**3**	**12**	***20.7%***
2-5 Classification	**2**	**8**	***13.8%***
Mid-term Exam1+Feedback	**1**	**3**	***5.2%***
2-5 Classification into sects and factions and arranged , with the study of explanatory models , indicating the evolutionary line	**5**	**20**	***34.5%***
Mid-term Exam2+Feedback	**1**	**3**	***5.1%***
-Methods of feeding algae. **. The importance of the biological and economic algae.**	**2**	**8**	***13.8%***

Study and examination requirements and forms of examination	**Theoretical 1st *Exam* + Theoretical 2nd *Exam*** **7th &13th** **20%** ***degrees for homeworks, lab reports and reseach*** **During semester** ***10%*** ***degrees for final practical Exam*** **16th** **20%** ***degrees for final theoretical Exam*** **17-19th** ***50%***
Media employed	**-Classrooms be equipped with with smart board and e-podium and laboratories provided with smart board Saving devices such as microscopes in the lab, microscopic specimens and other laboratory requirements.**
Reading list	**-alttahalib d.eabd aleaziz bin qublan alssariani w d . 'iidris munir altrk w a . d . muhammad almuhammad alhusayni , almadinat almunawwarat tariq alssalam almamlakat alearabiat alssaeudiat 2000 m .** **• 2 - 'asasiat tahdir aleaynat- alddaeiji - eabadallh bin rashid , ebdalslam muhammad almaliji , muhammad jalal muhammad ebdalftah , dar alkhariji lilnnashr walttawzie , alrriad (1997) m ..**

<table>
<tr><td>Module name:</td><td>Plant Physiology II</td></tr>
<tr><td>Module level, if applicable</td><td>7th</td></tr>
<tr><td>Code, if applicable</td><td>BOT 413</td></tr>
<tr><td>Subtitle, if applicable</td><td>none</td></tr>
<tr><td>Courses, if applicable</td><td>none</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>2nd</td></tr>
<tr><td>Person responsible for the module</td><td>Dr. Mona Makkya</td></tr>
<tr><td>Lecturer</td><td>Dr. Mona Makkya</td></tr>
<tr><td>Language</td><td>Arabic</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory course for biology program</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Total Contact hours/semester:58 hrs.
Lecture:28
Laboratory:30
Class size:25 students</td></tr>
<tr><td>Workload</td><td><table><tr><td>Total-contact hours</td><td>Self-study</td><td>Discussion</td><td>Total workload</td></tr><tr><td>58</td><td>60</td><td>20</td><td>138</td></tr></table></td></tr>
<tr><td>Credit points</td><td>4.9ECTs-3KSA.</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>To attend more than 75% of lecture and practical study.</td></tr>
<tr><td>Recommended prerequisites</td><td>Plant PhysiologyI BOT,324</td></tr>
</table>

Module objectives/intended learning outcomes	1. Knowledge: *1.1.* Comprehensive knowledge counts among the basic components of the cell metabolism mechanisms of carbohydrates, fats and proteins with the functionality of components within a living cell. 1.2. Find the relationship between energy and circulating mechanisms, and means of edit,and the allow tapped in the living cell 2.Skills cognitive: *2.1.* To investigate and analyze the information and uses it to propose innovative solutions. 2.2. Find similarities and differences between theoretical subject and practical applied and fact. Linking between different metabolic pathways that occur in the cell. 3. Interpersonal Skills & Responsibility: *3.*4 Show interest to respond with colleagues while doing projects and research. Responsible for self-learning and continuing personal development using modern technical means. *4.*Communication, Information Technology, Numerical: 4.2.1 Have mastered the use of information technology in the research and writing. *5.* Psychomotor*:* 5.1. Applies skill of many laboratory experiments related to the course using the tools and solutions and equipments in the lab.

Content	**Topics**	**No. weeks**	**No. hours**	**%**	**%%**
	1. Metabolic processes identification and their types and biological systems.	*1*	*4*	*7.6*	
	2. Definition of the basic rules of the science of thermodynamics and applied to living cell.	*1*	*4*	*7.6*	
	3. Recognize high phosphate nuc compounds and study the phosphor types in cell.	*2*	*8*	*15.38*	
	Mid-term 1+ feedback	*1*	*3*		
	4. The study of enzymes (and their characteristics, and the factors which affecting on them, theinteractions which catalyzed them).	*3*	*12*	*23.07*	
	Mid-term 2+ feedback	*1*	*3*		
	5. Carbohydrate metabolism (the main Pathways for catabolism carbohydrate, pentose phosphate pathway, processes for anabolism of sucrose, starch and cellulose in plant).	*3*	*12*	*23.07*	
	6. Fat metabolism (the fatty acids synthesis and methods of organization, oxidation, built, and demolished).	*1*	*4*	*7.6*	
	7. Metabolism of amino acids, proteins and essential nitrogen compounds.	*1*	*4*	*7.6*	
	8. Secondary compounds metabolism.	*1*	*4*	*7.6*	
Study and examination requirements and forms of examination	1-Theoretical 1st test – 5th week -10% Theoretical 2nd test – 9 th week-10% 2- Practical test+ diverse activities -During semester-10% 3- Final practical test- 16 th week - 20% 4- Final theoretical test - 16 – 19 th week - 50%				

Media employed	**1. Accommodation** Buildings Class room for 40- 50 Black board Laboratory for 20-30 students. Different laboratory apparatus toperform experiments.. Plant samples for experiments. Chemical materials for preparing different concentrations of solutions use during testing. **Otherresources** • Smart blackboard and projector • pH meter • Spectrophotometer • Lab coat
Reading list	المراجع الرئيسة: ١- فسيولوجيا النبات (الإنزيمات وأيض النبات) الجزء الثاني د. محمد جميل عبد الحافظ مطابع جامعة الرياض ١٩٧٨م. ٢- فسيولوجيا النبات العامة (الجزء الثاني) د. محمد بن عمر باصلاح و د. علي بن عبد المحسن الهلال و د. محمد حمد الوهيبي جامعة الملك سعود ١٤٢٢ هـ . ٣- فسيولوجيا النبات العملية عبدالجواد – هشام ومحمد حمد الوهيبي الناشر : عمادة شؤون المكتبات جامعة الملك سعود الرياض ١٤٠٩هـ . ١ - التنفس – الوهيبي ، محمد حمد الناشر : عمادة شؤون المكتبات – جامعة الملك سعود – الرياض ١٩٨٢م. ٢- كيمياء حيوية (كيمياء حيوية تركيبية وكيمياء حيوية فسيولوجية الحملاوي عبدالرحمن أحمد) الطبعة الثالثة دار القلم الكويت ١٩٨٤م. ٣-اسس الكيمياء الحيوية الأعسر محمد عبدالمنعم المكتبة الاكاديمية القاهرة ١٩٩٩م. *3- Steward , F,C,Growth and Organizotion in Plants .Addison-Wesley Co.Reading Warening 1986.*

<table>
<tr><td>Module name:</td><td>Research methodology</td></tr>
<tr><td>Module level, if applicable</td><td>7th</td></tr>
<tr><td>Code, if applicable</td><td>BIO,415</td></tr>
<tr><td>Subtitle, if applicable</td><td>none</td></tr>
<tr><td>Courses, if applicable</td><td>none</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>2nd</td></tr>
<tr><td>Person responsible for the module</td><td>Dr .Amal Elsayed</td></tr>
<tr><td>Lecturer</td><td>Dr .Amal Elsayed</td></tr>
<tr><td>Language</td><td>Arabic</td></tr>
<tr><td>Relation to curriculum</td><td>compulsory</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Total Contact hours/semester:30 hrs.
Lecture:30
Class size:12 students</td></tr>
<tr><td>Workload</td><td><table><tr><td>Total-contact hours</td><td>Self-study</td><td>Discussion</td><td>Total workload</td></tr><tr><td>30</td><td>48</td><td>7</td><td>85</td></tr></table></td></tr>
<tr><td>Credit points</td><td>2.9 ECTs-2KSA.</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>Absence does not exceed 25%</td></tr>
<tr><td>Recommended prerequisites</td><td>none</td></tr>
</table>

<table>
<tr><td>Module objectives/intended learning outcomes</td><td>Knowledge
On completing this course, students will be able to:
Propose the subject and the aim of the work.
Describe the plan.
Cognitive Skills
Explain results
Write an essay
Interpersonal Skills & Responsibility
Show a trend towards accepting the opinions of others .
Communication, Information Technology, Numerical
- use IT and search for information.
-Innovate in presentation</td></tr>
<tr><td>Content</td><td><table>
<tr><th>List of Topics</th><th>NO.of Weeks</th><th>Contact Hrs.</th><th>%of content</th></tr>
<tr><td>Scientific research. Definition. The project suggested.</td><td>2</td><td>4</td><td>13.3</td></tr>
<tr><td>Introduction of the project. Description of the point suggested- writing the plan</td><td>2</td><td>4</td><td>13.3</td></tr>
<tr><td>How to get information from different sources, classical library, electronic sources</td><td>4</td><td>8</td><td>26.7</td></tr>
<tr><td>Writing essay</td><td>4</td><td>8</td><td>26.7</td></tr>
<tr><td>Revision of the project (research)</td><td>3</td><td>6</td><td>20</td></tr>
</table></td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>Research 40 marks
Final theoretical Exam 60 marks</td></tr>
<tr><td>Media employed</td><td>D2L
E-MAIL
classroom provided with smartboard , computer , internet connection and enough seats</td></tr>
<tr><td>Reading list</td><td>Abu Soliman, A.,I.,(1423):Writing the Scientific Research.El- Roushed .press.KSA.</td></tr>
</table>