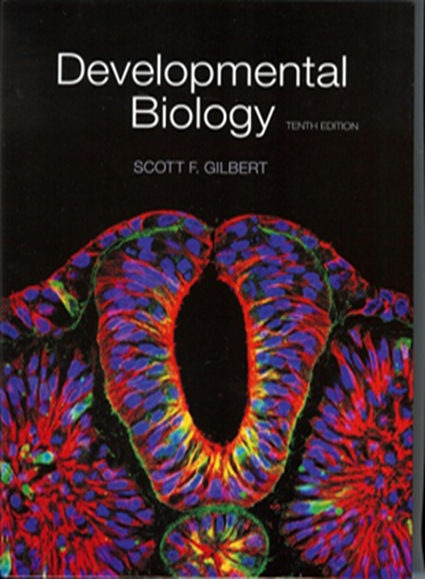
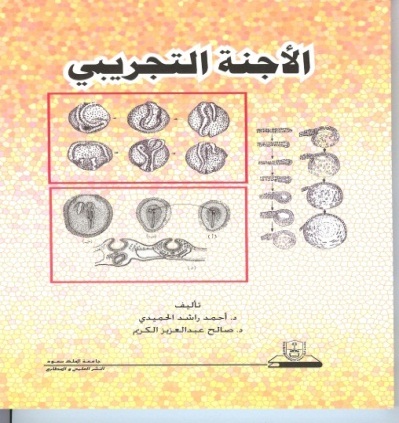
**King Saud University / College of Science /Zoology Department**

**Course content: Principles of Experimental Embryology 2(1+1)** **(Zoo 424)**

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| **Zoo 424** | **Course title: Principles of Experimental embryology**  **http://fac.ksu.edu.sa/ahimaidi** | **2 hours 2(1 + 1)** |
| **Objective** | **The aim of this course is to provide the student with basic information about experimental embryology that led to understand the process of embryonic cell differentiation and organogenesis of embryos development .Study some applied experiment on embryos.** |  |
| **Lecture:1** | **-        Course Content** Introduction, course contents and requirements  **-      Theory:** A historical overview of experimental embryology | **First week** |
| **lecture : 2**  **lecture:3**  **lecture:4** | **Cellular differentiation and embryonic induction:**  **(A1- Cellular Differentiation and Determination**  **-** Factors that control cell differentiation:  **2- Embryonic induction:**  **-** Definition of Embryonic Induction  -         **3-Embryonic Organizer**  -          In amphibians, birds, and mammals  -          Conclusions of embryonic induction | **Second week**  **Third week**  **Fourth week** |
| **Lecture:5** | **Embryonic cells and cancer cells :**  Cancer cells/'theories of carcinogenesis  Similarities between embryonic cells and cancer cells | **Sixth week** |
| **lecture:6** | **Birth defects: Teratology**  The critical period of fetal development. Experimental studies Factors that cause birth defects in of embryos. | **Seventh week** |
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| **Exam: 1** | **First exam from lecture 1-6 (10 marks)** | **Eight week** |
| **Lecture:7** | **Parthenogenesis :**  **-**The concept of parthenogenesis reproduction/Artificial parthenogenesis. | **Nine week** |
| **Lecture:8**  **lecture 9** | **Artificial insemination (AI) and *In vitro* fertilization(IVF):**  **-** Types of artificial insemination /Collection of sperm/egg .Artificial insemination in laboratory and farm animals.  -        *In vitro* fertilization (ICSI) in humans and babies test tube. | **10th Week**    **11th week** |
| **Lecture:10**  **Lecture :11**  **Lecture :12**  **Lecture :13** | **Applide studies on embryos**  **-**Production of twins and Cloning.  -Embryonic and somatic stem cells.  Chimera: embryo fusion | **12th week**  **13th week** |
| **2ndExam** | **From lecture from 7 to 11 (10 marks)** | **14th Week** |
| **3rd Exam**  **Final exam** | **Term paper topic presentation (10 marks).**  **Final exam (40 marks)** | **6-15th week**  **16-17th week** |

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| **Theory**  **References**  **Books.** | 1. **1- Experimental Embryology:** by Ahmad Rashed Al Himaidi and Saleh Abdulaziz Karim / King Saud University Press,2008.   **2-Developmental Biology "**by Scott F. Gilbert 2014. 10th ed .Sinauer Association Inc. Sunderland Massachusetts's. [**http://fac.ksu.edu.sa/ahimaidi**](http://fac.ksu.edu.sa/ahimaidi) |

**King Saud University / College of Science /Zoology Department**

**Lab Course content: Principles of Experimental Embryology 2(1+1)**  **(Zoo 424)**

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| **Week /Lab .no** | **Principles of Experimental embryology**  **Zoo (424 ) Practical content:(2hr per lab per week)** |
| **Practical :I** | **Tools and devices** used in experimental embryology labs. |
| **Practice: II** | **Micro tube preparation**: Hair loop and needles pull micro tubes. |
| **Practical: III** | **Activate the ovaries** with hormones in the frog |
| **Practice :IV** | **Superovulation of frog**: Activate ovaries by the pituitary gland. |
| **Practice :V** | **Chick embryo** : Making a window on chicken embryo |
| **Practice :VI** | **The Shell cover** chicken embryo development |
| **Practice :VII** | **Whole mount slide** of chicken embryo |
| **Practice: VIII** | **Teratology: Effect** of some factor affected embryos. |
| **Practical: IX** | **Reproductive Cycle** :Vaginal smear estrus cycle detection |
| **Practice: X** | ***In vitro* fertilization (IVF)** :Superovulation and *in vitro* fertilization in mice.(Sperm and ova collection and ) |
| **Practical : XI** | **Embryo transfer** : Collection and transfer of embryos |
| **Practical XII** | **Embryo Staining**: Staining mammalian embryos (Cleavage). |
| **Practical XIII** | **Visiting** or attending of applied Embryology lab (e.g. IVF unit) |
| **Practical XIV** | **The Final Exam** : (20 marks) +Weekly reports 10 marks =**30 marks** |

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| **Reference book** | **Title :Embryonic Technologies/** by Ahmed Al Himaidi/ King Saud University Press/2012/1433H. |