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| **Benha University** **Faculty of Science****جامعة بنهاDepartment of Zoology**  |
| **Course Specification**318 Z: Adaptation physiology  |
| **A- Affiliation** |
| **Relevant program:** |  Zoology B.Sc. Program |
| **Department offering the program:** | Department of Zoology |
| **Department offering the course:** | Department of Zoology |
| **Academic year/level:**  | Third level |
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| B - Basic information |
| **Title:** Adaptation physiology  | **Code:** 318 Z | **Year/level:** Third level |
| **Teaching Hours:** | **Lectures:** 2 | **Tutorial:** 0 |
|  | **Practical:** 2 | **Total:** 3 h/week |
| C - Professional information |
| **1 – Course Learning Objectives:** |
| The objective of this course is to study:1- Introduction to cardiovascular and respiratory systems. 2- Adaptation physiology to high and low temperature.3- Adaptation physiology to high and low light.4- starvation physiology.5- High altitude, space and deep sea physiology.6- Sport physiology. |

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| **2 - Intended Learning Outcomes (ILOS)** |
| **a - Knowledge and understanding:**On successful completion of the course, the student should demonstrate knowledge and understanding of: a1- Memorise cardiovascular and respiratory systems. a2- Recognise adaptation physiology to high and low temperature and light.a3- Discover human body adaptation to starvation.a4- Investigate high altitude, space and deep sea adaptation physiology.a5- Recognise sport physiology. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. b1- Link between normal and adaptive cardiovascular system in temperature, high altitude, space and deep sea and sport.  b2- Interpert physiological adaptation to high and low light. b3- Combine between endocrinology and light adaptation. b4- Compare between normal and adaptive respiratory system in temperature, high altitude, space and deep sea and sport.  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: c1- Count red blood cells.  c2- Detect hematocrit value. c3- Draw cardiac muscle. c4- Dissect heart of fog. c5- Explain electrocardiogram (ECG). |
| **d - General skills:**On successful completion of the course, the student should be able to: d1. Use information and communication technology effectively. d2. Work in a team effectively, manage time, collaborate and communicate withothers positively. d3. Exhibit the sense of beauty and neatness.  d4- Search for information and engage in life-long self learning discipline. |

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|  | **3 - Contents** |
| **Lecture topics** | **Lecture hours** |
|  | Introduction to cardiovascular y system. | 2 |
|  | Introduction to respiratory systems. | 2 |
|  | Adaptation physiology to high temperature. | 2 |
|  | Adaptation physiology to low temperature. | 2 |
|  | Adaptation physiology to high light. | 2 |
|  | Adaptation physiology to low light.  | 2 |
|  | High altitude physiology.  | 2 |
|  | Space physiology. | 2 |
|  | Deep sea physiology. | 4 |
|  | Effect of sport on cardiovacular system. | 2 |
|  | Effect of sport on respiratory system. | 2 |
|  | Starvation physiology. | 2 |
|  | Seminar | 2 |
|  | Revision  | 2 |

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| **4 - Teaching and Learning methods:** |

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| **Intended Learning Outcomes** | **Lecture** | **Presentations & Movies** | **Discussions & Seminars** | **Practical** | **Problem solving** | **Brain storming** |
| **Knowledge & Understanding** | a1 | Memorise cardiovascular and respiratory systems.  | x | x | x | 0 | x | x |
| a2 | Recognise adaptation physiology to high and low temperature and light. | x | 0 | x | 0 | 0 | x |
| a3 | Discover human body adaptation to starvation. | x | 0 | x | 0 | 0 | x |
| a4 | Investigate high altitude, space and deep sea adaptation physiology. | x | 0 | x | 0 | 0 | x |
| a5 | Recognise sport physiology. | x | 0 | x | 0 | 0 | x |
| **Intellectual Skills** | b1 | Link between normal and adaptive cardiovascular system in temperature, high altitude, space and deep sea and sport.  | **x** | 0 | **x** | 0 | **x** | **x** |
| b2 | Interpert physiological adaptation to high and low light. | **x** | 0 | **x** | 0 | **x** | **x** |
| b3 | Combine between endocrinology and light adaptation. | **x** | 0 | **x** | 0 | **x** | **x** |
| b4 | Link between normal and adaptive respiratory system in temperature, high altitude, space and deep sea and sport.  | **x** | 0 | **x** | 0 | **x** | **x** |
| **Practical and professional skills** | c1 | Count red blood cells.  | 0 | 0 | 0 | x | 0 | 0 |
| c2 | Detect hematocrit value. | 0 | 0 | 0 | x | 0 | 0 |
| c3 | Draw cardiac muscle. | 0 | 0 | 0 | x | 0 | 0 |
| c4 | Dissect heart of fog. | 0 | 0 | 0 | x | 0 | 0 |
| c5 | Explain electrocardiogram (ECG). | 0 | 0 | 0 | x | 0 | 0 |
| **General Skills** | d1 | Use information and communication technology effectively. | 0 | 0 | 0 | 0 | x | x |
| d2 | Work in a team effectively, manage time, collaborate and communicate with others positively. | 0 | 0 | 0 | x | x | x |
| d3 | Exhibit the sense of beauty and neatness. | x | x | x | 0 | 0 | 0 |
| d4 | Search for information and engage in life-long self learning discipline. | 0 | 0 | 0 | 0 | x | x |

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| **5- Students’ Assessment Methods and Grading:** |

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| **Tools:** | To Measure | **Time schedule** | **Grading** |
| Semester Work and Mid-Term Exam  | a1 to a5, b1 to b4, and d1 to d4 | Biweekly | 12 % |
| Oral exam | a1 to a5 and b1 to b4 | Fifteenth week | 10 % |
| Practical exams | c1 to c5 and b1 to b4. | Fourteenth week | 30 % |
| Written exam | a1 to a5 and b1 to b4 | Sixteenth week | 48 % |
| Total | 100 % |

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| **6- List of references:** |
| **6-1 Course notes**Non**6-2 Required books** - Guyton, A.C. and Hall, J.E. (2006): Textbook of Medical Physiology.11th Ed. Elsevier Inc. Philadelphia.Chapter 43 and 44.-Harvey, R.A. and Ferrier, D.R. (2011): Lippincotts Illustrated Reviews: Biochemistry, North American Edition. 5th Ed, JB Lippincott, Philadelphia. Chapter 24.**6-3 Recommended books**- Davenport, J. (1992): Animal life at low temperature. London: Chapman & Hall- Campbell, N. A.; Reece, J. B.; *et al.* (2002): Biology. 6thEd. Benjamin/Cummings.- Davenport, J. (1992): Animal life at low temperature. Chapman & Hall, London**6-4 Periodicals, Web sites, etc.**[www.shmoop.com/animal-movement/temperature-regulation.html](http://www.shmoop.com/animal-movement/temperature-regulation.html)[www.boundless.com/biology/homeostasis/thermoregulatory-processes/modes-of-thermoregulation/](http://www.boundless.com/biology/homeostasis/thermoregulatory-processes/modes-of-thermoregulation/)www.rinconmedico.org |
| **7- Facilities required for teaching and learning:** |
| * Physiology Lab.
* Chemicals and samples.
* Using of slit overhead projector
* Using a black board
* Group Discussions
* Data show
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| **Course coordinator:** | Dr. Marwa atef elewa abdelmaksoudDr. Doaa Sabry Ibrahim |  |
| **Head of the Department:** | Prof. Dr. Salwa Ebrahem Abd-El Hady |  |
| **Date:** | 2015 / 2016 |  |