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| **Benha University** **Faculty of Science****جامعة بنهاDepartment of Zoology**  |
| **Course Specification****313 Z: Physiology**  |
| **A- Affiliation** |
| **Relevant program:** |  Zoology & chemistry 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:** Physiology | **Code:** 313 Z | **Year/level:** Third level |
| **Teaching Hours:** | **Lectures:** 2 | **Tutorial:** 0 |
|  | **Practical:** 3 | **Total:** 3 h/week |
| C - Professional information |
| **1 – Course Learning Objectives:** |
| The objective of this course is to enable the students to understand types of carbohydrates, lipid and protein and their digestion, absorption and metabolism. Students also understand different types of enzymes and their action. |

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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- List different types of food stuff. a2- Recognise carbohydrates, proteins and lipids digestion, absorption and metabolism. a3- Define enzymes.  a4- List different types of enzymes. a5- Discover enzymes mode of actions. a6- Label factors affecting enzymes activities. |
| **b - Intellectual skills:**On successful completion of the course, the student should be able to. b1- Distinguish the different types of food stuff and enzymes. b2- Interpret digestion of food stuff in the light of evidence provided by enzymes mode of actions.  |
| **c - Practical and professional skills:**On successful completion of the course, the student should be able to: c1- Analysis the different types of food stuff and enzymes. c2- Differentiate the physical and chemical properties of different types of food stuff. c3- Handle chemical materials and biological samples safely taking into consideration their physical and chemical properties to avoid hazards associated with their use.  |
| **d - General skills:**On successful completion of the course, the student should be able to: d1- Use information and communication technology effectively. d2- Think independently, and solve problems on scientific basis in practical. d3- Work in a team effectively, manage time, collaborate and communicate with others positively. d4- Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities. |

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| **3 - Contents** |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1. Types of carbohydrates and its digestion and absorption.
 | 2 | 0 | 3 |
| 1. Carbohydrates metabolism (1).
 | 2 | 0 | 3 |
| 1. Carbohydrates metabolism (2).
 | 2 | 0 | 3 |
| 1. Types of protein and lipid and their digestion and absorption.
 | 2 | 0 | 6 |
| 1. Protein metabolism.
 | 2 | 0 | 3 |
| 1. Lipid metabolism.
 | 2 | 0 | 3 |
| 1. Enzymes definition and properties.
 | 4 | 0 | 3 |
| 1. Enzymes mechanism of action
 | 2 | 0 | 6 |
| 1. Enzymes types.
 | 2 | 0 | 3 |
| 1. Factors affecting enzymes activities.
 | 4 | 0 | 3 |
| 1. Enzymes function.
 | 2 | 0 | 3 |
| 1. Inhibition of enzyme activity.
 | 2 | 0 | 3 |
| **Total hours** | **28** | 0 | **42** |

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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 | List different types of food stuff. | x | 0 | 0 | x | 0 | 0 |
| a2 | Recognise carbohydrates, proteins and lipids digestion, absorption and metabolism. | x | x | x | x | 0 | 0 |
| a3 | Define enzymes. | x | 0 | 0 | 0 | 0 | 0 |
| a4 | List different types of enzymes. | x | x | 0 | x | 0 | 0 |
| a5 | Discover enzymes mode of actions. | x | x | x | 0 | 0 | 0 |
| a6 | Label factors affecting enzymes activities. | x | 0 | x | 0 | 0 | x |
| **Intellectual Skills** | b1 | Distinguish the different types of food stuff and enzymes. | 0 | 0 | x | **x** | **x** | **x** |
| b2 | Interpret digestion of food stuff in the light of evidence provided by enzymes mode of actions**.** | 0 | 0 | x | **x** | **x** | **x** |
| **Practical and professional skills** | c1 | Analysis the different types of food stuff and enzymes. | 0 | 0 | 0 | x | 0 | 0 |
| c2 | Differentiate the physical and chemical properties of different types of food stuff. | 0 | 0 | 0 | x | 0 | 0 |
| c3 | Handle chemical materials and biological samples safely taking into consideration their physical and chemical properties to avoid hazards associated with their use. | 0 | 0 | 0 | x | 0 | 0 |
| **General Skills** | d1 | Use information and communication technology effectively. | 0 | 0 | 0 | x | x | 0 |
| d2 | Think independently, and solve problems on scientific basis in practical. | 0 | 0 | 0 | x | x | x |
| d3 | Work in a team effectively, manage time, collaborate and communicate with others positively. | 0 | 0 | 0 | x | x | x |
| d4 | Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities. | 0 | 0 | x | 0 | 0 | 0 |

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

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| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work  | a1 to a6, b1, b2, d1 to d4  | Fifth week | 2 % |
|  Mid-Term Exam | a1 to a6, b1 and b2  | sixth week | 10 % |
| Practical exams | a1 to a6 and c1 to c3 | Fourteenth week | 30 % |
| Oral exam | a1 to a6, b1 and b2 | Fifteenth week | 10 % |
| Written exam | a1 to a6, b1 and b2 | Sixteenth week | 48 % |
| Total | 100 % |

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| **6- List of references:** |
| **6-1 Course notes**Lecture and practical notes approved by Zoology Department. **6-2 Required books** Text – book of animal physiology, general and comparative physiology &biochemistry (1970). Hurkat P.C. and Mathur P.N., pp: 44- 65.[Harper's Illustrated Biochemistry, 28th Edition - Robert K. Murray](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCkQFjAA&url=http%3A%2F%2Fbooks.google.com%2Fbooks%2Fabout%2FHarper_s_Illustrated_Biochemistry_28th_E.html%3Fid%3Dv6rwAAAAMAAJ&ei=VeFXUuLoIMfoiAfZ04HABw&usg=AFQjCNHDfmfQb0BCYDH4QsWcHy0OP8p5Ag&bvm=bv.53899372,d.aGc&cad=rja)**6-3 Recommended books**[Introduction to Nutrition and Metabolism](http://books.google.com/books?id=1aCQXdyLHboC&printsec=frontcover&dq=Introduction+To+Nutrition+And+Metabolism,+Fourth+Edition&hl=ar&sa=X&ei=m0FpUtOGNOyw4QSp54GoAg&ved=0CC0Q6AEwAA) David A. Bender - 1997* Review of medical physiology (Ganong), 2003

**6-4 Periodicals, Web sites, etc.**http://www.nutritionandmetabolism.com/<http://en.wikipedia.org/wiki/Metabolism>[www.enzymestuff.com](http://www.enzymestuff.com)<http://en.wikipedia.org/wiki/Enzymes> http://www.brenda-enzymes.org |

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| **7- Facilities required for teaching and learning:** |
| * Physiology Lab.
* Chemicals used in qualitative analysis of carbohydrates, proteins, lipids and enzymes types.
* Data show.
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| **Course coordinator:** | Prof. Dr. Moshira M.E. SeliemDr. Aza M. Awd |  |
| **Head of the Department:** | Prof. Dr. Aziza A.M. El-Shafey |  |
| **Date:** | 2013 / 2014 |  |