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| **Benha University**  **Faculty of Science**  **جامعة بنهاDepartment of Zoology** | | | | | |
| **Course Specification**  **303 Z: Biochemistry (1)** | | | | | | |
| **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:** Biochemistry (1) | | **Code:** 303 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 chemical properties of carbohydrates amino acids and fatty acids and oxidation reactions definition, types, mode of action and effects. | | | | | | |

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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- Recognise chemical properties of carbohydrates, amino acids and fatty acids.  a2- glycogenolysis, glucogenesis and gluconeogenesis  a3- Recognise oxidation reactions types, mode of action and effects. |
| **b - Intellectual skills:**  On successful completion of the course, the student should be able to.  b1- Interpret glycogenolysis, glucogenesis and gluconeogenesis.  b2- Link oxidation reaction mode of action and their effects. |
| **c - Practical and professional skills:**  On successful completion of the course, the student should be able to:  c1- Differentiate the physical and chemical properties of carbohydrates, amino acids and fatty acids.  c2- Use the laboratory equipment and instruments by responsible, safe and ethical manner to investigate living systems. |
| **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. |

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| **3 - Contents** | | | |
| **Topic** | **Lecture hours** | **Tutorial hours** | **Practical hours** |
| 1. Types of carbohydrates | 2 | 0 | 3 |
| 1. Chemical properties of carbohydrates. | 2 | 0 | 3 |
| 1. Glycogenesis (1). | 2 | 0 | 3 |
| 1. Glycogenesis (2). | 2 | 0 | 3 |
| 1. Gluconeogenesis. | 2 | 0 | 3 |
| 1. Glycogenolysis. | 2 | 0 | 3 |
| 1. Types of amino acids | 2 | 0 | 3 |
| 1. Chemical properties of amino acids. | 2 | 0 | 3 |
| 1. Chemical properties of fatty acids. | 2 | 0 | 3 |
| 1. Oxidation definition. | 2 | 0 | 3 |
| 1. Types of oxidation reactions. | 2 | 0 | 3 |
| 1. Mechanism of oxidation reactions. | 2 | 0 | 3 |
| 1. Effect of oxidation reactions. | 2 | 0 | 3 |
| 1. Seminar. | 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 | Recognise chemical properties of carbohydrates, amino acids and fatty acids. | x | x | 0 | 0 | 0 | 0 |
| a2 | glycogenolysis, glucogenesis and gluconeogenesis | x | x | x | 0 | 0 | 0 |
| a3 | Recognise oxidation reactions types, mode of action and effects. | x | x | 0 | 0 | 0 | 0 |
| **Intellectual Skills** | b1 | Interpret glycogenolysis, glucogenesis and gluconeogenesis. | 0 | 0 | x | **x** | **x** | **x** |
| b2 | Link oxidation reaction mode of action and their effects | 0 | 0 | x | **x** | **x** | **x** |
| **Practical and professional skills** | c1 | Differentiate the physical and chemical properties of carbohydrates, amino acids and fatty acids. | 0 | 0 | 0 | x | 0 | 0 |
| c2 | Use the laboratory equipment and instruments by responsible, safe and ethical manner to investigate living systems. . | 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 |

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

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| **Tools** | **To Measure** | **Time schedule** | **Grading** |
| Semester Work | a1, a2, a3, b1, b2 and d1 to d3 | Five week | 2 % |
| Mid-Term Exam | a1, a2, a3, b1 and b2 | sixth week | 10 % |
| Practical exams | c1, c2, b1 and b2 | Fourteenth week | 30 % |
| Oral exam | a1, a2, a3, b1 and b2 | Fifteenth week | 10 % |
| Written exam | a1, a2, a3, b1 and b2 | Sixteenth week | 48 % |
| Total | | | 100 % |

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| **6- List of references:** |
| **6-1 Course notes**  Non  **6-2 Required books** [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 and spectrophotometer. |

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| **Course coordinator:** | Dr. Hannen Hessen Mohammoud Ouda  Dr. Doaa sabry Ibrahim |  |
| **Head of the Department:** | Prof. Dr. Salwa Ebrahem Abd-El Hady |  |
| **Date:** | 2015 / 2016 |  |