Course Specification Card: Pathological Biochemistry

<table>
<thead>
<tr>
<th>Institution</th>
<th>ALAZHAR UNIVERSITY</th>
<th>College</th>
<th>Faculty of Pharmacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td>Biochemistry</td>
<td>Program (s) in which the course is offered</td>
<td>Bachelor Degree in Pharmaceutical Sciences</td>
</tr>
</tbody>
</table>

Information about faculty member responsible for this course

<table>
<thead>
<tr>
<th>Location</th>
<th>Office Hours</th>
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</thead>
<tbody>
<tr>
<td>Biochemistry Dept., fourth floor</td>
<td>SAT SUN MON TUE WED THU</td>
</tr>
<tr>
<td>Dr Ola Sayed Mohammed Ali</td>
<td>2 2</td>
</tr>
<tr>
<td>Dr Hanan Abd Elmawgood Atia</td>
<td>2 2</td>
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<tr>
<td>Dr Abeer Ibrahim Abd Elfatah</td>
<td>2 2</td>
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<tr>
<td>Dr Iman Hassan Ibrahim</td>
<td>2 2</td>
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<tr>
<td>Dr Heba Gamal Abd Elaziz</td>
<td>2 2</td>
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</table>
First: Course Identification

<table>
<thead>
<tr>
<th>Course Number &amp; code</th>
<th>Course Title</th>
<th>Time</th>
<th>Units' Type</th>
<th>Study level</th>
</tr>
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<tbody>
<tr>
<td>PBC 513</td>
<td>Pathological Biochemistry</td>
<td>10hr/week</td>
<td>5hr/week</td>
<td>5th year</td>
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Second: Overall aims of course:

The course focuses on comprehensive knowledge and clear understanding of the etiology, laboratory diagnosis and clinical features of different diseases of liver, kidney and GIT as well as abnormalities of carbohydrates, lipid, and protein metabolism. In addition, the student will be able to diagnose the physicochemical basis of biological systems and related clinical problems. Also, the student will be able to understand the basic principles of clinical enzymology, molecular biology, hormones, minerals, vitamins, and free radicals. Moreover, the student should be able to know the importance of maintenance of acid base balance within the human body.

The laboratory section illustrates Glucose tolerance test, Lipid profile, Liver function tests, Total proteins, albumin and A/G ratio, and Clinical enzymology.

Also illustrate of some new techniques as ELISA and electrophoresis.

Third: (A) Intended learning outcomes of course (ILOs):

By the end of this course, students will be able to:

a- Knowledge and understanding: the students should be able to:

a1- Understand the principles of body function in health and disease state.
a2- Understand clinical problems related to biological systems.
a3-Recognize the biochemical features of metabolic abnormalities and appropriate medical intervention.

a4-Describe etiology and mechanism of diseases of different organs.

a5-Identify how to analyze biological fluids (whole blood, plasma, serum, and urine) by different laboratory techniques.

a6-Recognize techniques of biochemistry laboratory and principles of various instruments used in biochemical analysis, as well as their applications in addressing issues related to human diseases.

a7-Recognize how to promote health among public through prevention of diseases and their complications.

a8-Understand basic principles of molecular biology, protein synthesis and their clinical applications.

b- **Professional and practical skills: the students should be able to:**

b1- Handle chemicals, blood samples as well as biological fluids safely.

b2- Conduct standard biochemical laboratory procedures and instrumentation.

b3- Analyze different blood sample constituents by different methods.

b4- Diagnose different diseases based on laboratory tests and reports.

b5- Give a suitable management to the case condition, diet regimen and lifestyle.

b6- Describe proper laboratory tests required for patients to test biological functions of various organs of the body.

b7- Distinguish minor illnesses from those which need medical intervention.

b8- Interpret abnormal blood findings and know how to make differential diagnosis.

b9- Use the proper medical terms, abbreviations and symbols in pharmacy practice.

b10- Conduct research studies, calculate, and interpret the results.

**c- Intellectual skills: the students should be able to:**

c1- Find and assess biochemical information of clinical applications.

 c2- Select the proper test for diagnosis and assessment of metabolic disorders.

 c3- Evaluate and interpret abnormal blood tests results.

 c4- Identify the scientific way of thinking to reach final cases diagnosis.

 c5- Handle different abnormal blood samples in both systematic and creative way.

 c6- Predict the type of tumor based on tumor markers analysis.
c7-Apply biochemical knowledge in the field of medicinal laboratory.
c8- Link biochemical markers to relevant organs for accurate diagnosis and differentiation of diseases.
c9- Analyze and interpret case study results.

**d- General and transferable skills: the students should be able to:**
d1- Communicate clearly by both verbal and written means.
d2- Work effectively in a team.
d3- Practice independent learning needed for continuous professional development.
d4- Develop writing and presentation skills.
d5- Demonstrate scientific thinking, problem solving and decision making abilities.
d6- Demonstrate creativity and time management abilities.

**B) Course Items:**

- **Theoretical topics**
  - Carbohydrates, lipids, and proteins abnormalities
  - Hormones
  - Molecular Biology
  - Clinical enzymology
  - Gastro intestinal tract disorders
  - Liver diseases
  - kidney diseases
  - Free radical
  - Minerals
  - Vitamins
  - Tumor markers

- **Practical topics**
  - Glucose tolerance test
  - Lipid profile
  - Liver function tests
  - Total proteins, albumin and A/G ratio
  - Clinical enzymology
  - ELISA and electrophoresis techniques
Al-Azhar University  
Faculty of Pharmacy (Girls)  
Quality Assurance Unit

**Weekly Plan of Course Items**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>- Carbohydrates, lipids, and proteins abnormalities</td>
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</tbody>
</table>
| 2    | - Carbohydrates, lipids, and proteins abnormalities  
|      | - Hormones |
| 3    | - Hormones  
|      | - Molecular Biology  
|      | - first exam |
| 4    | - Molecular Biology |
| 5    | - Molecular Biology |
| 6    | - Molecular Biology  
|      | - second exam  
|      | - Clinical enzymology |
| 7    | - Clinical enzymology  
|      | - Gastro intestinal tract disorders |
| 8    | - Gastro intestinal tract disorders |
| 9    | - third exam  
|      | - Liver diseases |
| 10   | - Liver diseases  
|      | - kidney diseases |
| 11   | - Free radical  
|      | - Minerals |
| 12   | - Minerals  
|      | - Vitamins |
| 13   | - Tumor markers  
|      | - Fourth exam |

**Teaching and learning methods**
- Books.
- Laboratories.
- Chemicals.
- Glassware.
Biochemical kits.
Calibrated instruments.
Spectrophotometers.
Study halls.
Data show.

Schedule of Assessment Tasks for Students during the course

<table>
<thead>
<tr>
<th>No</th>
<th>Evaluation Kind</th>
<th>Week due</th>
<th>Proportion of Final Assessment</th>
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<tbody>
<tr>
<td>1</td>
<td>Group Project</td>
<td>13\textsuperscript{th} week</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Participation</td>
<td>weekly</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Homework assignments</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Quiz</td>
<td>3\textsuperscript{rd}, 6\textsuperscript{th}, 9\textsuperscript{th}, 13\textsuperscript{th}</td>
<td>13.3%</td>
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<tr>
<td>5</td>
<td>Practical tests</td>
<td>5\textsuperscript{th}, 6\textsuperscript{th}, 12\textsuperscript{th}, 13\textsuperscript{th}</td>
<td>26.7%</td>
</tr>
<tr>
<td>6</td>
<td>Oral tests</td>
<td>14\textsuperscript{th} week</td>
<td>20%</td>
</tr>
<tr>
<td>7</td>
<td>Final Exam</td>
<td>14\textsuperscript{th} week</td>
<td>40%</td>
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Fourth: Learning Resources
(A) Required Text:
Notes of practical pathological chemistry (for fifth year students), approved by Head of Biochemistry Department.

(B) Essential References:
- *lippincott’s illustrated reviews fifth edition 2011, sixth edition 2014*
- *Harper's Biochemistry. 2003, 2009*

(C) Electronic Web Sites:
- [www.freebook4doctor.com](http://www.freebook4doctor.com)
- [www.pubmed.com](http://www.pubmed.com)