



Course Specification for Master Degree in

Program on which the course is given : Master Degree in Medical Biochemistry

Department offering the program: The Medical Biochemistry Department.

Major or minor element of program :

Department offering the course: The Medical Biochemistry department.

Academic year 2016-2017

Credit points: 4

Course coordinators:

I. Aim of the course:

By the end of the course the post graduate students should be able to have the professional knowledge of the Basic Biochemistry .

II. Intended learning outcomes:

- 1. Knowledge and understanding: By the end of the course the candidate should;**
 - a) Describe primary, secondary, tertiary and quaternary structure of proteins and differentiate between them.
 - b) Define denaturation, list denaturation factors and describe the effect of denaturation on proteins.
 - c) List the most important hemoproteins and their functions.
 - d) Define osteoporosis and list the risk factors.
 - e) Define carbohydrates and list their classification.
 - f) Define and identify the major classes of lipids in the human body and in our diet.
 - g) Classify the fatty acids and recognize their structure and importance.
 - h) Describe and understand the structure of enzymes, their properties and mechanism of action.
 - i) Define and classify vitamins.
 - j) Point out the biochemical functions of each vitamin.
- 2. Intellectual skills: By the end of the course the candidate should be able to;**
 - a) Describe the attachment of heme to apomyoglobin and globin.
 - b) Differentiate between glycoproteins and proteoglycans.

- c) Identify types, structure and functions of the most potent steroid hormones.
- d) Describe the different factors that affect the rate of enzyme activity.

3. Professional and practical skills: By the end of the course the candidates should be able to;

- a) Understand the genetic abnormalities and pathogenesis of various types of haemoglobinopathies.
- b) Use plasma enzymes as laboratory tools to diagnose clinical diseases.
- c) Describe the biochemical basis of the deficiency manifestations each vitamin.
- d) State the recommended daily allowance for each vitamin.
- e) Describe the clinical picture of hypervitaminosis of fat soluble vitamins.

4. General and transferable skills: By the end of the course the candidates should be able to;

- a) Describe the structure of elastin and correlate it to alpha -1- antitrypsin deficiency.
- b) Describe briefly the structure and functions of fibronectin and fibrillin linking defective fibrillin with Marfan syndrome.
- c) Recognize the structure and function of monosaccharides
- d) List the important disaccharides, recognize their structure and mention their importance.
- e) Define simple lipids and classify them.
- f) Classify and illustrate the basic structure of different classes of conjugated lipids and recognize their importance.
- g) Classify enzymes and identify different types of enzyme inhibitors.

III. Course contents:

Topics (specify which ILO each topic fulfill if applicable)

1. Chemistry of proteins-----
 - a. Biological importance and functions of proteins---
 - b. Structure of proteins---
 - c. General properties of proteins
 - d. Classification of proteins
 - e. Chemistry of hemoproteins
 - f. Proteins of extracellular matrix
2. Chemistry of carbohydrates-----
 - a. Chemical nature of carbohydrates----
 - b. Biomedical importance of carbohydrates---
 - c. Monosaccharides
 - d. Disaccharides
 - e. Oligosaccharides

- f. Polysaccharides
- 3. Chemistry of lipids
 - a. Definition, importance and classification of lipids
 - b. Fatty acids
 - c. Eicosanoids
 - d. Simple lipids
 - e. Compound lipids
 - f. Derived lipids
- 4. Enzymes
 - a. Definition, common features, nomenclature and chemical nature
 - b. Enzyme specificity and mechanism of enzyme action
 - c. Role of enzymes in catalysis
 - d. Factors affecting rate of enzyme catalyzed reaction
 - e. Enzyme inhibition and regulation of enzyme activity
 - f. Isoenzymes and enzymes in clinical diagnosis
 - g. Classification of enzymes
- 5. Vitamins
 - a. Definition and classification of vitamins
 - b. Fat soluble vitamins
 - c. Water soluble vitamins

IV. Teaching methods:

example

lectures:

Tutorials

- Slides /data show
- Discussion
- Clinical meetings departmental / interdepartmental

Presentations

- Including clinical case presentations

Independent assignments

- Writing / presenting a literature review article

Lecture Timetable:

Topic	No of hours	Lectures
Biological importance and functions of proteins---	2	2
Structure of proteins---	2	2
General properties of proteins	2	2
Classification of proteins	2	2
Chemistry of hemoproteins	2	2
Proteins of extracellular matrix	2	2
Chemical nature of carbohydrates----	2	2
Biomedical importance of carbohydrates---	2	2
Monosaccharides	2	2

Disaccharides	2	2
Oligosaccharides	2	2
Polysaccharides	2	2
Definition, importance and classification of lipids	1	1
Fatty acids	2	2
Eicosanoids	2	2
Simple lipids	2	2
Compound lipids	3	3
Derived lipids	2	2
Definition, common features, nomenclature and chemical nature	2	2
Enzyme specificity and mechanism of enzyme action	3	3
Role of enzymes in catalysis	2	2
Isoenzymes and enzymes in clinical diagnosis	2	2
Factors affecting rate of enzyme catalyzed reaction	2	2

Classification of enzymes	1	1
Definition and classification of vitamins	1	1
Fat soluble vitamins	6	6
Water soluble vitamins	5	5
Total	60	60

V. Teaching and learning facilities:

Lecture halls.

Rooms for small groups

Audio-visual aids (data-show, slide projection).

List of references

- Course notes
- Essential books (text books)
 - 1 . Lippincott's illustrated reviews.
 2. Harpers' textbook

- Recommended books

..... Department book

5. Periodicals, Web sites:

<http://www.ncbi.nlm.gov/>

VI. Assessment:



Course Specification for Master Degree 2nd part in Medical Biochemistry and Molecular Biology

Cancer and Biochemical basis of diseases

Program on which the course is given: Master Degree in Medical Biochemistry and Molecular Biology.

Department offering the program: The Department of Medical Biochemistry and molecular biology

Major or minor element of program :

Department offering the course: The Department of Medical Biochemistry

Academic year 2017-2018

Credit points: 2

Course coordinators: Prof.Dr.Head of Medical Biochemistry and molecular biology department.

I. Aim of the course:

The aim of the course is to present an overview of important aspects of biochemical and genetic features of cancer cells.

II. Intended learning outcomes:

A. **Knowledge and Understanding:** By the end of the program the candidate should be able to:

- 1) Describe important properties of oncogenes and tumor suppressor genes.
- 2) Identify the concepts of genomic instability, aneuploidy and angiogenesis in tumors.

B. **Intellectual Skills:** By the end of the program the candidate should be able to:

Contrast the role of epigenetic mechanisms and stem cells in cancer.

C. **Professional and Practical Skills:** By the end of the program the candidate should be able to:

Apply the recent studies of biology of cancer to the development of various new therapies.

D. General and Transferable Skills: By the end of the program the candidate should be able to:

Assess the use of tumor markers for following responses to treatment and to detect recurrence.

III. Course contents:

1. Fundamental features of carcinogenesis
2. Causes of genetic damage
3. Oncogenes and tumor suppressor genes
4. Growth factors and abnormalities of their receptors
5. Cell cycle and its abnormalities
6. Genomic instability and aneuploidy
7. Apoptosis
8. Epigenetic mechanisms
9. Role of stem cells in cancer
10. Angiogenesis
11. Tumor biomarkers
12. New therapies

IV. Teaching methods:

example

lectures:

Tutorials

- Slides /data show
- Discussion
- Clinical meetings departmental / interdepartmental

Presentations

- Including clinical case presentations

Independent assignments

- Writing / presenting a literature review article

Lecture Timetable:

1. Fundamental features of carcinogenesis	1 lecturer	1 hour
2. Causes of genetic damage	1 lecture	1 hour
3. Oncogenes and tumor suppressor genes	3 lectures	2 hours each
4. Growth factors and abnormalities of their receptors	2 lectures	1 hour each
5. Cell cycle and its abnormalities	2 lectures	1 hour each
6. Genomic instability and aneuploidy	2 lectures	2 hours each
7. Apoptosis	3 lectures	1 hour each
8. Epigenetic	3 lectures	1 hour each
9. Role of stem cells in cancer	1 lecture	1 hour
10. Angiogenesis	2 lectures	2 hour each
11. Tumor biomarkers	2 lectures	1 hour each
12. New therapies	1 lecture	1 hour

V. Teaching and learning facilities:

Lecture halls.

Rooms for small groups

Audio-visual aids (data-show).

List of references

- Course notes
- Essential books (text books)
 1. Marks' Basic Medical Biochemistry "A Clinical Approach" (fourth edition); Lieberman and Marks
 2. Harpers Illustrated Biochemistry (29th edition); RK Murray et al.
- Recommended books
 1. Lippincott's Illustrated Reviews: Biochemistry (sixth Edition).
 2. Lehninger Principles of Biochemistry (fifth edition); Nelson and Cox.
- Periodicals, Web sites, ... etc
 1. <https://www.ncbi.nlm.nih.gov/pubmed>
 2. <http://biochemweb.net/>

VI. Assessment:

Attendance criteria:

The prerequisite for entry the final examination is 75% attendance of the lectures as shown in the attendance book.

Assessment tools:

Final examination: Written oral etc

Assessment schedule:

Examination description:

Written exam. Duration: minutes. Type of questions.

Oral: number of examiners etc

Weighing of assessment:

Final-term written examination -- %

Oral examination --- %

Practical/clinical exam ---%

Other types of assessment (article review and presentations) --- %

Total 100%

Grading system:

Course directors



Course Specification for Master Degree in Medical Biochemistry and Molecular Biology

(Digestion and Changes in the large intestine)

Program on which the course is given : Master Degree in Medical Biochemistry and Molecular Biology .

Department offering the program: The Medical Biochemistry Department.

Major or minor element of program :

Department offering the course: Medical Biochemistry department.

Academic year: 2016-2017

Credit points: 1

Course coordinators: Prof. Dr. Head of Medical Biochemistry

I. Aim of the course:

The aim of the course is to allow the candidate to describe the digestion and absorption of various food stuffs, to describe the metabolism of xenobiotics, to differentiate between its different phases and to know some examples of xenobiotics.

II. Intended learning outcomes:

1. Knowledge and understanding: By the end of the course the candidate should;

A1. Describe the digestion and absorption of carbohydrates , lipids, proteins vitamins and minerals.

A2. Define intestinal fermentation and putrefaction.

A3. Define xenobiotics.

A4. List examples for substrates used in conjugation.

A5. Identify the fates of xenobiotics.

A6. Name enzymes involved in phase I of xenobiotic metabolism.

A7. State the common features that all cytochrome P450 isozymes have.

A8. Explain why cytochrome P450 is considered the most versatile biocatalyst known.

A9. Explain the importance of cytochrome P450.

2. Intellectual skills: By the end of the course the candidate should be able to;

B1.illustrate how xenobiotics are metabolized in the body.

B2.illustrate the two general phases of xenobiotic metabolism.

B3.illustrate the metabolic importance of glutathione.

3. Professional and practical skills: By the end of the course the candidates should be able to;

C1.Measure the dose of phenobarbital that should be given when ethanol is consumed at the same time.

C2.Measure the dose of acetaminophen that should be given.

4. General and transferable skills: By the end of the course the candidates should be able to;

D1.Realize some of the effects of chronic consumption of ethanol.

D2.Demonstrates how drugs are metabolized in the body.

D3. Demonstrates the role of aflatoxin B1 in hepatocarcinogenesis in human.

III. Course contents:

Topics (specify which ILO each topic fulfill if applicable)

1. Digestion and absorption of various food stuffs.
 - A.carbohydrates.
 - B. lipids.
 - C. proteins.
 - D. vitamins.
 - E.minerals.
2. Metabolism of xenobiotics in liver.
 - a. Define xenobiotics.
 - b. Fates of xenobiotics.
 - c. Phases of xenobiotics.
 - d. Aim of xenobiotic metabolism in liver.
 - e. Examples of CYP450 xenobiotics metabolism reactions.

IV. Teaching methods:

1-lectures:

2-Tutorials

- Slides /data show
- Discussion

3-Presentations

Lecture Timetable:

topic	Hours/topic	NO of lectures	Total hours
1.Digestion and absorption of carbohydrates.	2	2	15
2.Digestion and absorption of lipids.	2	2	
3.Digestion and absorption of proteins.	2	2	
4.Digestion and absorption of vitamins and minerals.	2	2	
5.Definition and fates of xenobiotics.	1	1	

6. Aim and Phases of xenobiotics	3	3	
7.Examples of CYP450 xenobiotics metabolism reactions	3	3	

V. Teaching and learning facilities:

Lecture halls.

Rooms for small groups

Audio-visual aids (data-show, slide projection).

List of references

- Course notes
- Essential books (text books)
 1. Marks' Basic Medical Biochemistry "A Clinical Approach"(fourth edition); Lieberman and Marks
 2. Harpers Illustrated Biochemistry (29th edition); RK Murray et al.
- Recommended books
 1. Lippincott's Illustrated Reviews: Biochemistry (sixth Edition).
 2. Lehninger Principles of Biochemistry (fifth edition);Nelson and Cox.
- Periodicals, Web sites, ... etc
 1. <https://www.ncbi.nlm.nih.gov/pubmed>
 2. <http://biochemweb.net/>

VI. Assessment:

Attendance criteria:

The prerequisite for entry the final examination is 75% attendance of the lectures as shown in the attendance book.

Assessment tools:

Final examination: Written , oral and practice exam.

Assessment schedule:

Examination description:

➤ **Written exam.**

First part:

1- Compulsory courses:

One written exam (3 hours)(225 mark)

2- elective courses:

One written exam(2 papers)(2 hours)(25+25 marks)

Second part:

1- medical biochemistry:

One written exam (3 hours)(150 marks)

2-Molecular biology:

One written exam (3 hours)(150 marks)

➤ **Oral:**

First part:

1- Compulsory courses:

1 Oral exam(150 marks)

2- elective courses:

2 oral exams(25+25marks)

Second part:

1 Oral exam(200 marks)

➤ **Practicle:**

First part:

1 exam for the Compulsory courses:(175 mark)

Second part:

1 exam(200 mark)

Weighing of assessment:

Final-term written examination %

Oral examination %

Practical/clinical exam ---%

Other types of assessment (article review and presentations) --- %

Total 100%

Grading system:

Course directors

Attendance criteria:

The prerequisite for entry the final examination is 75% attendance of the lectures as shown in the attendance book.

Assessment tools:

Final examination: Written oral etc

Assessment schedule:

Examination description:

Written exam. Duration: minutes. Type of questions.

Oral: number of examiners etc

Weighing of assessment:

Final-term written examination -- %

Oral examination --- %

Practical/clinical exam ---%

Other types of assessment (article review and presentations) --- %

Total 100%

Grading system:

Course directors