Cairo University - Faculty of Medicine
Clinical and Chemical Pathology Department

MD Elective Course – Advanced Chemical Pathology [CCP 922 CP]

Advanced Chemical Pathology Course Specification
MD Degree in Clinical and Chemical Pathology

Program on which the course is given: Doctorate in Clinical and Chemical Pathology

Department offering the program: Clinical and Chemical Pathology Department
Department offering the course: Clinical and Chemical Pathology Department

Course code: CCP922CP

Element of the program (Compulsory/Elective): Elective course to determine subspeciality

Academic year: 2015-2016

Date of approval: July 2015

Credit points: 10 Credit points

Course duration: 30 weeks

Teaching hours: Theoretical 70% and Practical 30%

Course Coordinators:

- Prof. Lamia Mansour
- Assit. Prof. Heba El Baz
- Lecturer May Hamed
- Lecturer Radwa Marwan

I. AIM OF COURSE

The Chemical Pathology course for doctorate degree in Clinical and Chemical Pathology is designed to provide candidates with the general knowledge and skills necessary to interpret and give consultant level of advice on chemical pathology tests. It also acquaints candidates with the principles of good laboratory practice and medical research.

II. INTENDED LEARNING OUTCOMES

A. **Knowledge and Understanding:**

By the end of the program the candidate should be able to:

1. Describe the structure and operation of a chemical pathology laboratory
2. Explain “method and instrument” development, performance and application.
3. Identify the effect of pre, intra and post-analytical variables on test results.
4. Explain the pathophysiology of different body systems.
5. Describe the role of laboratory tests in management of different diseases
6. Explain the standards and updated guidelines related to chemical pathology.

B. Intellectual Skills:

By the end of the program the candidate should be able to:

1. Criticize various laboratory methodology, and instrumentation regarding their performance and application.
2. Make informed decisions regarding the introduction of a new diagnostic test/method/instrument in the laboratory
3. Analyze, and interpret sophisticated and unusual laboratory results.
4. Detect possible interferences affecting laboratory results, whether pre-analytical, analytical or post-analytical
5. Provide consultant advisory services on various chemical pathology tests.
6. Assess risk in the chemical pathology laboratory.

C. Professional and Practical Skills:

By the end of the program the candidate should be able to:

1. Gain in-depth practical experience of up to date techniques used in chemical pathology.

2. Troubleshoot failures in laboratory instruments or processes logically and systematically.
3. Perform an evaluation study of a method or instrument according to guidelines.
4. Write explicit reports, business letters and e-mails
5. Implement health and safety policies and procedures in the laboratory.
6. Plan quality improvement programs, in collaboration with colleagues.
7. Formulate a strategy for service improvement in view of benchmarks and available resources.
8. Design and deliver an effective teaching event

D. General and Transferable Skills:

By the end of the program the candidate should be able to:

1. Apply leadership and teamwork skills required to implement laboratory policies.
2. Participate in multidisciplinary and scientific meetings
3. Communicate effectively orally and in writing
4. Use ethical behavior in dealing with medical and non-medical laboratory staff,
5. Treat patients with empathy respecting their dignity and confidentiality.
6. Demonstrate competent use of information technology including the use of word processing, databases, statistical programs, laboratory, and hospital information systems.
7. Expand and enhance their own knowledge and abilities through adopting life-long learning practices.

III. COURSE CONTENT

i. **Advanced Chemical Pathology**

ii. **Main topics: Students will receive presentations, team based learning sessions or group discussions about recent advances in the following subjects:**

Analytical Techniques and Instrumentation

a. Optical techniques
b. Electrochemical techniques and chemical sensors
c. Electrophoresis
d. Chromatography
e. Mass Spectrometry
f. Immunochemical techniques
g. Measurement of radioactivity
h. Enzymes and rate analysis
i. Automation
j. Point of care testing

Analytes

1. Amino acids, peptides, and proteins
2. Non-protein nitrogenous compounds
3. Carbohydrates
4. Lipids, lipoproteins, apolipoproteins
5. Cardiac risk factors
6. Serum enzymes
7. Tumor markers
8. Electrolytes and blood gases
9. Hormones
10. Hemoglobin, iron, bilirubin, porphyrins
11. Vitamins and trace elements
12. Toxic metals
13. Therapeutic drugs
14. Clinical toxicology

Pathophysiology

a. Renal function and kidney disease
b. Proteinuria
c. Disorders of water, electrolytes, and acid-base disturbances
d. Assessment of hepatic function, investigation of jaundice, acute and chronic liver disease
e. Clinical biochemistry of the cardiovascular system
f. Gastrointestinal and pancreatic disease
g. Disorders of bone and mineral metabolism
h. Tumor markers, and metabolic effects of tumors
i. Diabetes
j. Hypoglycemia
k. Hypothalamic, pituitary and adrenal disorders
l. Thyroid gland disorders
m. Disorders of the parathyroid gland
n. Male and female reproduction related disorders
o. Pregnancy and prenatal testing
p. Disorders of growth and development
q. Nutritional Disorders and their management
r. Inborn errors of metabolism, inherited metabolic disorders, and newborn screening.
s. Clinical biochemistry at extremes of age
t. Biochemical aspects of hematological disorders

iii. **Course contents:** Distribution of course contents

SUBJECTS	Team Based Learning Sessions (hrs)	Lectures/ Tutorials (hrs)	Practical (hrs)	Total (hrs)	% of Total
Analytical Techniques and Instrumentation	6	15	35	56	29
Analytes	6	10	35	51	26
Pathophysiology	36	33	20	89	45
Total	**48**	**58**	**90**	**196**	**100**

IV. TEACHING METHODS

The course ILOs will be fulfilled through the following teaching/learning methods:

- Post-graduate education course through team-based learning sessions (integrated active learning) and small group lectures/seminars on selected topics. Sessions will be held once weekly and each session will be followed by an assignment that the candidate has to fulfill.
- Assignments, both individual and group
- Work based experiential learning
- Observation of laboratory methods
- Practical laboratory training

- Scientific meetings, case presentation and discussion
- Independent self-directed learning and learning with peers

V. LIST OF REFERENCES

- Course notes
- Textbooks
  - Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics. ISBN 978-1-4557-4165-6
  - Clinical Biochemistry Metabolic and Clinical Aspects. ISBN 978-0-7020-5140-1
  - Tietz Clinical Guide to Laboratory Tests. ISBN 13:978-0-7216-7975-4

  Recommended books
  - Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. ISBN -13: 978-8131232729
- Periodicals:

  Clinical Chemistry

VI. TEACHING AND LEARNING FACILITIES

- Lecture hall provided with a white board and audio-visual aids (data-show)
- Post graduate laboratory
- Department laboratories: Adult, pediatric and emergency hospital labs

VII. ASSESSMENT

Assessment criteria:

The prerequisite for sitting to the final exam is 75% attendance of the lectures and fulfilling all the credit points specified for the scientific activities, the training program and the elective course which should be registered in the log book.

Assessment tools:

- Formative assessment: students will receive feedback during the course through assignments and assessment exams
- Final summative written, oral, and practical examination will be carried at the end of the course.

Assessment schedule:

- The final exam is held twice per year in May and November.
- Day 1: written exam, day 2: oral exam, and days 3-5: practical exam

Examination description:

- Written Exam: 3-hour written exam, format is MCQ, short essay, and case study.
- Oral Exam: One hour oral exam by a board of four examiners including 1-2 external examiners.
- Practical Exam: Three day exam. Day 1 and 2 include hands on practical assessment of various techniques and instrumentation; day 3 is a short answer exam of three hours duration, on test interpretations, practical work place test and method related problems, calculations,

Weighing of assessment

Cairo University - Faculty of Medicine

Clinical and Chemical Pathology Department

MD Elective Course – Advanced Chemical Pathology [CCP 922 CP]

Exams	Marks	Intended Learning Outcomes
Written	200	A2 A4 A5 A6 B1 B2 B3 C3 C6 C7
Oral	150	A1-A6 B1-B3 B5 B6 C3 C6 C7 D3
Practical	150	A3 B3 B4 B5 C1 C2 C3 C5 D4 D6
Total	500	

Head of Department

Prof. Fatma El Mougy