



Clinical Microbiology Course Specification

Master Degree in Clinical and Chemical Pathology

Program on which the course is given: Master 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: CCP822CM

Element of the program (Compulsory/Elective): Compulsory course

Academic year: 2015-2016

Date of approval: July 2015

Credit points: 3 Credit points

Course duration: 15 weeks

Teaching hours: Theoretical 75% and Practical 25%

Program Coordinators:

- Prof. Dr. Afaf El Banna
- Prof. Dr. Sahar Khairat

I. AIM OF COURSE

To develop qualified clinical pathologist, having knowledge needed for optimum and safe microbiological processing of clinical samples with satisfactory interpretation and correlation of test results with the clinical situation of the patient following lab. infection control guideline, capable of dealing with patients and communicating with colleagues and coworkers in a team.



II. INTENDED LEARNING OUTCOMES

A. Knowledge and understanding:

By the end of the course the candidate should be able to

1. list microbial causes of diseases in order of frequency
2. Classify microorganism to species level
3. Recognize urgent infectious conditions
4. Identify the appropriate specimen for different tests needed
5. list the criteria for acceptance and rejection of each specimen
6. Describe the basics of antimicrobial uses and resistance
7. Define community acquired infections and hospital acquired infections
8. Recommend the preventive measures for the different infections

B. Intellectual skills:

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

1. Relate isolated pathogen to the present clinical situation
2. Differentiate between diseases having the same presentations
3. Criticize healthcare practices from the infection control point of view
4. Recommend laboratory tests (microbiological and others) to reach diagnosis of infections
5. Analyze microbiological laboratory results
6. Interpret microbiological results

C. Professional and practical skills:

By the end of the course the candidates should be able to;

1. Operate different devices used in microbiology lab.
2. Examine clinical samples both macroscopically and microscopically in accordance with health and safety guidelines
3. Collect different clinical samples correctly
4. Conduct laboratory work-up to identify infectious organisms
5. Differentiate between organisms of the same genus
6. Describe in-vitro growth and biochemical characteristics of different microorganisms
7. Practice aseptic techniques and other laboratory safety measures
8. Perform count of cells in body fluids
9. Perform count and analysis of semen
10. Perform count no. of bacteria in semi-quantitative cultures
11. Perform antimicrobial susceptibility testing using disk diffusion method.



D. General and transferable skills:

By the end of the course the candidates should be able to;

1. Reflect the importance of a full scientific microbiological report for the benefits of patients
2. Adopt teamwork and interpersonal cooperation skills
3. Integrate information from a variety of sources
4. Adopt practice-based learning and improvement
5. Acquire problem solving skills.



III. COURSE CONTENT

i. Compulsory Course Clinical Microbiology

ii. Main topics: Students will receive presentations, seminars or group discussions about the following subjects:

A. General:

1. Pre-analytical aspects for diagnosis of infections
2. Non-cultural methods for microbial diagnosis
3. Flow charts and SOPs for diagnosis of infections (Gram +ve cocci, *Enterobacteriaceae*, Non-fermenter Gram –ve bacilli)
4. Applications of molecular biology techniques in clinical microbiology
5. Reporting and interpretation of microbiological lab results and case notification

B. Aerobic and Facultative anaerobic bacteria (Pathogenesis and diagnosis):

1. Gram +ve cocci (*Staph.* & *Strept*)
2. Spore-forming (*Bacillus*)
3. Non-spore forming Gram +ve bacilli (*Corynebacteria*, *Listeria*, *Erysipelothrix*, *Actinomycetes*, and related organisms)
4. Enteric Gram –ve bacilli (*E.coli*, *Klebsiella*, *Enterobacter*, *Serratia*, *Proteus*, *Morganella*, *Providentia*, *Shigella*, *Salmonella*, *Arizona*, and related organisms)
5. Non-fermenters (*Pseudomonades*, *Burkholderia*, *Stenotrophomonas*, *Acinetobacter*) and other uncommon Gram –ve bacteria (*Actinobacillus*, *Achromobacter*, *Alcaligenes*, *Ochrobactrum*, *Capnocytophaga*, *Cardiobacterium*, *Chromobacteria*, *Eikenella*, *Cryseobacterium*, *Kingella*, *Moraxella*)
6. *Vibrios*, *Campylobacter*, *Helicobacter*, and associated organisms.
7. Miscellaneous Gram –ve bacilli (*Bordetella*, *Brucella*, *Francisella*, *Yersinia*, *Pasturella*, *Hemophilus*, *Neisseriae*, *Legionella*, *Bartonella*), and unusual bacterial pathogens (*Gardenerella*, *Mobiluncus*, *Streptobacillus*, *Calymmatobacterium* and *Tropheryma whipplei*)

C. Mycobacterial infections:

1. *Mycobacterium T.B.*
2. Mycobacteria other than T.B (MOTT)



D. Diagnosis of systemic infections:

1. Skin and soft tissue infections
2. Eye, ear, and upper respiratory tract infections.
3. Lower respiratory tract infection.
4. Genitourinary tract infections
5. Sexually transmitted diseases
6. Diarrhea; infective and toxic
7. Liver and gastro-intestinal tract infections
8. Central nervous system and body fluid infections
9. Endocarditis and cardio-vascular infections
10. Bone and joint infections
11. Pyrexia of unknown etiology
12. Blood transfusion and transplantation associated infections

E. Infections of immunocompromised patients:

1. Bacterial, Viral, Fungal, and Parasitic infections of immunocompromised patients.

E. Antimicrobial monitoring:

1. Antimicrobial groups, mode of action, and mechanisms of resistance.
2. Antimicrobial testing and resistance
3. Diagnosis of common resistance in Gram +ve cocci (MRSA, VRE)
4. Diagnosis of common resistance in Gram –ve bacilli (ESBL, AMPC)

G. Case Discussions

1. Respiratory tract infection
2. Urinary tract infection
3. Diarrhea
4. Osteomyelitis
5. Endocarditis
6. Antimicrobial resistance

H. Tutorials:

1. Flow charts and SOPs for diagnosis of infections (Gram +ve cocci, *Enterobacteriaceae*, Non-fermenter Gram –ve bacilli)
2. Applications of molecular biology techniques in clinical microbiology
3. Bacterial, viral, fungal, and parasitic infections of immunocompromised patients
4. Antimicrobial groups: mode of action, mechanisms of resistance, and strategy for treatment of infections.

**I. PRACTICAL CLASSES:**

1. Laboratory processing of respiratory specimens and for diagnosis of T.B.
2. Laboratory processing of urine specimens
3. Laboratory processing of genitourinary specimens
4. Laboratory processing of stool specimens
5. Blood culture
6. Laboratory processing of skin and tissue specimens
7. Laboratory processing of CSF specimens
8. Laboratory processing of body fluids
9. Drug susceptibility testing
10. Non-culture infectious disease diagnostic methods

iii. Course contents: Distribution of course contents

SUBJECTS	Lectures (hrs)	Case Discussion (hrs)	Tutorials (hrs)	Practical (hrs)	Total (hrs)	% of Total
A. General	1		1		2	3.4%
B. Aerobic and Facultative anaerobic bacteria (Pathogenesis and diagnosis)	10		1		11	19%
C. Mycobacterial infections	2	1		1	4	7%
D. Diagnosis of systemic infections	10	4		20	34	58.6%
E. Infections of immunocompromised patients			1		1	1.7%
F. Antimicrobial monitoring	2	1	1	2	6	10.3%
TOTAL	25	6	4	23	58	100%



IV. TEACHING METHODS

The course will be managed through the following teaching methods:

- **Lectures and Clinical case presentations and discussions:** are given 4hours/week for 9 weeks.
- **Practical Classes:** practical classes are run twice a week (2 hours each) for 6 weeks
- **Essay home works** which are corrected by faculty member and feedback is given to students
- **Students grouping and clinical training and monitoring:** One faculty member is assigned to every 5 students for on job training and achievement follow up

Lecture Tutorial and Lab Timetable

Wednesday	Session1	09:00am - 10:00am
	Session2	10.00am – 11.00am
Thursday	Session1	09:00am - 10:00am
	Session2	10.00am – 11.00am



V. LIST OF REFERENCES

- **Course notes**
- **Text books**
 1. Medical Microbiology. Jawetz, Menlneck & Adelberg, s
 2. District Laboratory Practice in Tropical Countries. Part 2. Monica Cheesbrough
 3. Key Points In Clinical Microbiology Practice. M.A. Wassef, and A.M.S. El-Banna

VI. TEACHING AND LEARNING FACILITIES

- Lecture hall: available, provided with a white board
- Audio-visual aids (data-show, slide projection): available
- Post graduate laboratory



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 which should be registered in the logbook as well as the thesis discussion and approval.

Assessment tools:

- Continuous formative assessment is carried throughout the course and registered in the logbook
- Final summative examination will be carried at the end of the course.

Assessment schedule: The final exam is held twice per year in May and November.

Examination description:

- **Written exam:** Duration: one and half hours exam in the form of short essay questions, problem based cases & MCQ.
- **Practical:** One session three hours duration.
- **Oral:** One session evaluated by two to three examiners

Weighing of assessment:

Exams	Marks	Weight	Intended Learning Outcomes
Written	80	53.4%	A(1-8), B(1-6), C(5,6), D(1,3,5)
Oral	35	23.3%	A(1-8), B(1-6), D(1,3,5)
Practical	35	23,3%	B(1-6), C(1-11), D(1-5)
Total	150	100%	

Head of Department

Prof. Dr.Fatma El Mougny