King Saud Bin Abdulaziz University for Health Sciences
College of Nursing
Basic Sciences Department
Fall Semester 2007-2008

Microbiology
(MICB 201)

Dr. Hanan Habib

Room 1 + Anatomy Lab

Office Hours: Saturday, 10-12 PM
Sunday, 11-12 PM
Tuesday, 2-3 PM

MIC-201 Microbiology
Syllabus

Course Title : Medical Microbiology
Course Symbol & No: MIC-201
Course Hours : (2 +1)
Required for Stream I and Stream II

Course Description

In this course, students will receive a board background of disease causing microorganism, with emphasis on morphology, immunity, pathogenicity, mode of microbial infections, the diagnostic and controls methods. Organisms to be studied include selected bacteria, fungi, viruses and protozoa of medical importance.

The laboratory component will involve learning basic laboratory skills and applied microbiological techniques, specimen collection under strict aseptic technique, common diagnostic serological tests, and the universal precautions laid down by centers for Diseases Control and Prevention.

Course Objectives

By the end of the course the student will be able to:

1. Develop a board understanding of microorganisms, including bacteria, viruses, fungi and protozoa.
2. Describe the basic elements of microbiology, including structure and basic genetics.
3. Define and describe methods used in the control of microorganisms.
4. Perform basic laboratory skills and basic microbiological techniques, including isolation, culture and identification of microorganisms.
5. Describe the relationship between microbiology, immunology and disease.
6. Discuss current advances in the field of microbiology that pertain to nursing.

Laboratory Objectives

1. Perform basic microbiological techniques, including sampling, staining, microscopy, isolation, culture and identification of organisms
2. Describe the most common diagnostic serological tests, skin test, PCR and ELISA.
3. Master strict aseptic technique in microbiology specimen collection, handling, storing, and transporting..
4. Demonstrate full understanding of and conform to Universal Precautions laid down by Centers for Diseases Control and Prevention in Atlanta recommended for all health care setting to protect patients, workers and the public alike.

Methods of instruction

Lectures will be given using power point data show with the necessary photos and illustration. Practical classes will be given in virtual laboratory using PowerPoint data show with detailed photos, procedures and sometimes with direct demonstrations of specimens and wet specimen collection and processing.

Course Assessment / Evaluation Methods

THEORY	
Med-Term I:	20%
Med-Term II:	20%
Final Theory	40%
PRACTICAL	
Quiz:	10%
Final Practical Exam:	10%
Total:	100%

Requires Textbook:

1. Nester, Eugene W. Anderson, Denise G. Robert, Evans C. Pearsall, Nancy N. (2001). Microbiology (3rd Ed). New York: University of Washington.
2. Computer assisted interactive international package/CD-ROM: self-study program.

Suggested textbooks

- Kathleen Park Talaro (2005). *Microbiology (5th Ed)*. McGraw- Hill.
- Kenth, Rayan J. (2003) *Sherris Medical Microbiology an Introduction to infectious Disease (3rd Ed)*. McGraw-Hill/ Appleton & Lange: University of Arizona, Tucson.
- (Laboratory, Handouts will be distributed to the students)

General Internet References and Resources / Electronic journals

- **-http://molbiol.ru/eng/journals/books/02_00mv.html**
  A microbiology web site contain Bacteriology, Parasitology and Mycology online books.

- **-http://www.microbes. info**
  This web site has a complete selection of pictures and interesting links for different fields of microbiology.

- **-www.mgm.ufl.edu/~gulig/mmid-lab/**
  This virtual lab contains a lab manual, lab images, flow chart, theory and practice for students to practice for students to practice bacterial identification and finally case diagnosis.

- **-http://www.md.huji.ac.il/microbiology/book/**
  (Baron's Medical Microbiology Textbook) The whole textbook is available online, including images.

  -

- **-httpwww.virology.net/courseware.html**
  Tutorials and online courses with Virology, Microbiology, Mycology and Parasitology components and links with additional information.

Course theory calendar for 16 week

Week	(Gregorian date)	Topics
1	11/9	Introduction to Microbiology
2	18/9	Introduction to bacteria
3	25/9	Introduction to sterilization
4	02/10	Introduction to disinfections
5	23/10	Introduction to viruses
6	30/10 1st Midterm	Antibiotics
7	06/11	Introduction to fungi
8	13/11	Introduction to parasites
9	20/11	Immunity & host Microbial interaction
10	27/11	Nosocomial infections
11	04/12	Respiratory Tract Infections
12	11/12	Skin and wound infections
13	01/01	Alimentary system infections
14	08/01 2nd Midterm	Genitourinary tract infections & HIV
15	15/01	Genetics & Revision
16	22/01	Revision

Week	Page number	Details
1	3-14	Human perspective, vital activities of microorganism, economic application. Genetic engeneering. Microbiology:past triumphs, future challenges. Microbial world:bacteria, archaea, eukarya. Nomenclature. Viruses,viroid, prions.
2	245-253 256-258	Principal of taxonomy-phenotypic characteristics to identify prokaryotes: microscopy, culture, biochemical tests, serology, fatty acids analysis. Characterising strain differences: biochemical typing, serologic typing, genomic typing, antibiotic typing.
3	113-120 125-127	Control of microbiology growth: principle of control, situational consideration, selection of antimicrobial procedure. Moist heat, Dry heat. Removal of microorganism by filtration Radiation to destry microorganism & Viruses.
4	120-124 127-128	Chemicals which destry microorganisms and viruses: potency of germicidal chemicals, selection of the appropriate germicidal chemicals, classes of germicidal chemicals. Preservation of perishable products: chemical preservative. Low temperature storage, reducing water.

5	341-346, 348, 352, 358-359	Structure and classification of viruses- classification of animal viruses- grouping based on routes of transmission. Methods used to study viruses: cultivation Interaction of viruses with hosts: acute infection, persistant infections Viruses and human tumors
6	497-506	Selective toxicity- antimicrobial action- spectrum of activity. Tissue distribution, metabolism, excretion of drugs- effect of combination of antibiotics- cost Mechanism of action of antimicrobial drugs: inhibition of cell wall, inhibition of protein synthesis, nucleic acid inhibition, inhibition of metabolic pathways, interference with cell membrane integrity, interference with mycobacterium tuberculosis.
7	307 - 311, 544 - 545, 685, 757	Fungal classification, fungal habit, fungal diseases in humans: skin diseases. Cryptococcal meningoencephalitis(table) Infection in HIV, pneumocystosis (table)
8	304 - 306, 618 - 622 624 - 626, 734, 736, 687, 759	Classification of protozoa, protozoa of medical importance, habitat, structure Protozoan diseases: malaria, schistosomiasis, African sleeping sickness, toxoplasmosis
9	369 – 374, 389 –391 397 , 453 - 455	Host defence overview: non specific defence- cell and tissues involved in host defence. Specific acquired immunity, nature of antigens, nature of

		antibodies, role of lymphocytes in specific immunity Microorganisms & human host: infection, pathogenicity & pathogens, virulence Infections & infectious diseases
10	488 –490 697 , 720	Nosocomial infections: reservoirs of infectious agents in hospitals, transmission of infectious agents in hospitals, preventing nosocomial infection Pseudomonas infections Gram-ve septicemia (epidemiology)
11	551, 556, 558, 559. 562 – 563 , 567, 569, 572, 579 – 580 582	Anatomy& infections of respiratory system – Bacterial infection of upper respiratory tract: Streptococcal pharyngitis, diphtheria, pink eye, earache, sinus infection- Viral infections of upper respiratory tract: common cold, adenopharyngitis- infection of lower respiratory tract: pneumococcal, klebsiella, mycoplasma, pertussis, tuberculosis- influenza – Valley fever, histoplasma
12	523 – 525, 527, 529, 535 , 538, 540, 543, 544 – 545 694 – 697 702, 703, 705, 711	Normal flora- Bacterial skin diseases: hair follicle infection, scalded skin syndrome, streptococcal impetigo, lyme disease- skin diseases caused by viruses: chiken box, measles, german measles, warts Skin diseases caused by fungi: superficial mycosis - Wound infections: Staph, pseudomonas, letanus, gas

		angene, actinomycosis – fungal wounf infection
13	588 – 589, 594, 596 – 597 601, 603 – 607, 609, 613, 614, 617, 628	Normal flora- helicopter pylori gastriis – Viral disease of upper alimentary system: herpes simplex, mumps – Bacterial disease of lower alimentary system: cholera, shigellosis, E. coli diarrhoea, E coli gastroenteritis, salmonellosis, campylobacteriosis – Viral diseases of lower alimentary system: rotavirus, viral hepatitis Protozoan discases of lower alimentary system: giardiasis, ameabiasis, enterobiasis, trichuriasis, ascariasis, taenia, fasciolopsiasis
14	635, 637 – 638, 641, 644, 647 – 648 650 – 652, 654 757 – 658, 660	Normal flora- urinary system infections: cystitis, leptospira, candidiasis Common sexually transmitted diseases: gonorrhoea, chlamydia, syphilis herpes simplex, HIV, Trichomoniasis, scabies.
15		Characteristics of DNA - Characteristics of RNA – DNA replication Gene expression: transcription, translation Spontaneous mutation, induced mutation.
16	Final Theory Exam	

Practical Course calendar for 16 week

Week	Topics
1	Safety rules, bacteriology items
2	Light, fluorescent, electron microscope
3	Wet smear, gram and ZN stain
4	Sterilization dry and moist heat
5	Disinfections & Universal precautions
6	Media, streaking, colony morphology, identification techniques
7	Antibiotic sensivity: Kerby Bauer, MIC
8	Eye, ear, nose, throat, skin, nasophayngeal specimen collection
9	CSF, blood, sterile sites, pus specimen collection
10	Urine, catheter, stools, cervical, prostat IUD specimen collection
11	Serology: RPR, VDRL, Widal& immunofluorescence
12	Tuberculin, PCR, ELISA
13	Viruses diagnosis, parasite ova, fungi
14	Genetics
15	Revision
16	Final Practical Exam