DEPARTMENT OF BIOLOGY
MEDGAR EVERS COLLEGE of the CITY UNIVERSITY OF NEW YORK

SYLLABUS
BIO 403 *** MICROBIOLOGY

INSTRUCTOR: Dr. M. Hassan Office: C316 telephone # (718) 270-6209
Office hours: Fridays: 12:30 - 1:30pm; 5:00 - 6:00pm; other days by appointment.

TEXTBOOKS:
1. Lecture: Brock Biology of Microorganisms; 11th ed 2006. Authors: Madigan, Martinko & Parker, Publisher: Prentice Hall, N.J.
2. Laboratory: Microbiology Laboratory Manual, Principles & Applications edition. Authors: Norell & Messley, Publisher: Prentice Hall

Additional Reading: Journals, Articles & Use of Computers encouraged.

COURSE DESCRIPTION:

Biology 403 is a one semester, 4 credit course that meets 3 hours per week for lecture and 3 hours per week for lab. The course is designed for Biology major students. The course will enable the students to learn about microorganisms, methods of their studies, mechanism of energy generation in different groups of microorganisms, microbial genetics, interaction of microorganisms with the biotic and abiotic components of the environment. The course will include also study Viruses, immune Response as well as the selected topics of Industrial microbiology

COURSE REQUIREMENTS:

The course consists of lectures & laboratories You must enroll in both Bio. 403 & Biol. 403. Lecture portion of the course will compromise 60% and the laboratory part will consist of 40%. The cumulative grade for the course will be based on the grades achieved in the Lecture and Laboratory examinations. Say, for example you average Lecture grade is 90 then 60% of 90 is *54.0* and overall lab grade is 94 then 40% of 94 is 37.6. Total grade is 91.6 for the course and a “P” for the Laboratory grade. Attendance is required and will be reinforced. The students are encouraged to ask questions during instruction and the laboratory hours. For additional help the students are encouraged to meet the instructor during office hours and by making appointments. The Biology department has the facilities for tutoring and also access to computers & audio-visual equipment.

GRADING:

The Lecture & Laboratory grades will be based on:
1. Two Lecture tests & a Final examination. Of the two tests, one will be counted as the Mid-term grade. The final examination grade will remain unchanged.
2. Lab grade will be based on laboratory works, quizzes, Mid-term & Final Laboratory examinations.
   Students are expected to attend all the Lecture & Laboratory sessions.
   Missed lab can’t be made up.

403 LECTURE TOPICS

Lecture	Chapter	Topics	Page#
1	1	Introduction: An overview of Microbiology. Microbes as cells	*3-5* & 10-29
2	2	Prokaryotes & Eukaryotes Comparison	*58-62*
3	3	Prokaryotes: Ultrastructure of prokaryote cell organelles	70-106
4	3	Ultrastructures of Prokaryotes cont'd	70-106
5	18	Eukaryotic Microorganisms	770-784
6	23	Eukaryotic Microorganisms cont'd. Pathogenic Eukaryotes: Fungi & Protozoa. Role of vectors.	*952,* 960, 966, 967-68, 980, 982-984
7	9	Microbial Genetics. DNA Structure	*305-354,* 181-208
8	9	Microbial Genetics cont'd.	305-354
9	10	Genetic Engineering & Plasmids	358-364
10	4	Microbial nutrition & metabolism	110-121
11	*5*	Microbial growth.	150-177
12	*5*	Microbial growth continued. Population Doubling time.	150-177
13		**First Lecture Exam, 1 hour long**	
14	8	Viruses: General Properties	*249-255*
15	8	DNA viruses; RNA viruses & Bacteriophage. Viral replication	*256-264* 265-300
16	14	Microbial Ecology & Biogeochemical cycle	533-603
17	15	Microbial evolution * taxonomy	606-632
18	15	Microbial Systemic & identification	627-632
19	12	Industrial Microbiology: Aquatic Microbiology	431-472 465-469
20	12	Industrial Microbiology cont'd.: Industrialmicrobial products Antibiotics production	43 1-472 431-453 442-447
21	12	Industrial Microbiology cont'd.: Wine, Vinegar & Cheese productions.	431-472 458-464 454-455
22	23	Microbial Diseases: Pathogenic microbes	930-976
23	19	Host-Parasites Relationships	786-810
24	20	Concepts of Immunology	815-864
25	20	Concepts of Immunology cont'd.: Immunoglobulins: structure & diversity	83 9-846
26	22	Epidemiology & Public Health Microbiology	904-927
27	22	Epidemiology & Public Health Microbiology cont'd	904-927
28	-	Reviews	
29	-	**FINAL EXAM**	

403 LABORATORY TOPICS

Lab	Exercise	Page#	Topics	
1	1,2,5,6	1-10	Introduction to Microscopy	Ex-I
		11-18	Calibration of Microscope	Ex-5
		41-46	Measurement of cell size	Ex-6
		49-52	Preparation of Smears & Simple stains	
2	7	55-*64*	Survey of Microorganisms Representatives of Prokaryotes (Monera) & Eukaryotes (Protista) Prepared slides & Wet mount	Ex-7
3	3	19-30	Differential Staining Procedures	Ex-3
4	8 & 9	65-78	Isolation techniques	Ex-8
		79-86	Oxygen requirements	Ex-9
5	11,12,13, 14	95-100	Selective & Differential	Ex-1 1
		101-106	Carbohydrate metabolism	Ex-12
		107-112	Nitrogen Metabolism Ex-13	
		113-118	Miscellaneous reactions Ex-14	
6	17	135-146	Rapid Diagnostic Tests	Ex-17
7	18 & 19	147-156	Microbial population count	Ex-l8
		157-166	Microbial population count of viable cells	Ex-19
8	20	167-176	Spectrophotometric method of bacterial growth	Ex-20
9	22 & 23	185-190	UV light as an antimicrobial	Ex-22
		191-198	Assay of antimicrobial agents Disk-Diffusion methods	Ex-23
10			**Mid-term Laboratory Exam**	
11		213-220	Detection of mutant strains of bacteria	Ex-26
12	Hand-out		Restriction enzyme cleavage of bacterial DNA/Plasmids	Handout
13		227-238	Serological reactions in Clinical microbiology	Ex-28
			PCR technique-Guest Professor	Handout
14			**FINAL Lab EXAM**	