

**New York Methodist Hospital
School of Clinical Laboratory Science**

Clinical Immunology/Serology

CLS 4060

CLS 4060D

2.0 Credits

Course Description:

This course is designed to introduce the student to the theory, principles, performance and evaluation of those laboratory assays commonly performed in the Clinical Immunology/Serology laboratory. Additionally, students will be introduced to the pathogenic processes influencing the development of immunologic responses. *CLS 4060, CLS 4060D Clinical Immunology/Serology, 2.0 credits*

Pre-requisites:

There are no pre-requisites for this course.

Didactic Course Objectives:

Upon completion of the course students will be able to:

- Discuss basic management functions of the Immunology/Serology laboratory, including: specimen processing, organization of daily workload and effective communication with peers and other hospital staff.
- Compare and contrast humoral and cellular immunity.
- Discuss the cells and cellular activity of the immune system.
- Compare and contrast acquired vs natural immunity and passive vs. active immunity.
- Discuss the role of immunoglobulins, Complement, and assay methods in immune reactions.
- Discuss the immune response to infectious diseases.
- Discuss the principles, application and interpretation of laboratory techniques utilized in the immunology/serology laboratory, including: fluorescent microscopy, electrophoresis, immunoelectrophoresis, EIS, EIA, nephelometry, immunofluorescence, immunodiffusion and PCR.
- Discuss the clinical significance of the immunologic/serologic assays for CRP, syphilis, hepatitis, pregnancy, RA, infectious mononucleosis, streptococcal antibodies, thyroid function and autoimmune diseases.
- Discuss the immunologic methods used in organ transplantation, bone marrow transplantation, and tumor immunity; and,
- Survive the course in good physical and mental health.

Methods of Instruction:**Traditional:**

This course is taught through lectures, demonstrations, hands-on activities, videos, prepared slides, laboratory instrumentation, slide sets, DVD's, power point presentations, and any other audio-visual/tutorial means as may be determined appropriate by the instructor.

Distance:

This course is taught through on online discussion forums, cohort seminars, through system Edvance 360 and a Web conference venue called Adobe Connect.

Course Delivery Method:

This course is offered on campus and online

Course Outline:

Traditional Week	Distance Week	Title	Details	Reading Assignments
1	1	An Overview of Immunology Antigens & Antibodies	History of Immunology Body defenses Innate vs. Adaptive Immunity Antigen characteristics Chemical and physical nature of antigens Antibody structure Functions of antibodies	Chapter 1 Chapter 2
2	2	The Cells & Cellular Activities of the Immune System	Origin and development of blood cells Granulocytic cells and Phagocytosis Acute inflammation Cell surface receptors Disorders of Neutrophils Lymphocytes and plasma cells B and T lymphocytes	Chapter 3 Chapter 4
3	3	Soluble mediators of the Immune System	The Complement system Cytokines and interleukins	Chapter 5

			Interferons Hematopoietic stimulators Acute phase proteins	
4 EXAM # 1	4	Agglutination Methods Electrophoresis Methods Labeling techniques in Immunoassay	Quality descriptors in Immunology Inactivation of Complement Pipetting techniques Dilutions Antibody (antibody titers) POCT Card pregnancy tests	Chapter 7 Chapter 8 Chapter 9
5	5	Review of automated procedures, intro to Molecular technique, Miscellaneous techniques	Principles of agglutination Latex agglutination Flocculation tests Direct bacterial agglutination Hemagglutination ABO Blood groups Enzyme immunology Labeling techniques	Chapter 10 Chapter 11 Chapter 12
6	6	The Immune Response to Infectious Disease Streptococcal Infection Syphilis	Development of infectious disease Bacterial diseases Parasitic and fungal diseases Viral and Rickettsial diseases Etiology and epidemiology of syphilis Signs and symptoms Rapid plasma regain (RPR) FTA-Abs	Chapter 15 Chapter 16 Chapter 17 Chapter 18

7 MIDTERM				
8	7	TORCH Toxoplasmosis, Rubella, & CMV Herpes	Etiology and epidemiology of Toxoplasmosis Signs and symptoms Immunologic manifestations Etiology and epidemiology of CMV Signs and symptoms Immunologic manifestations Etiology and epidemiology of Rubella Signs and symptoms Immunologic manifestations	Chapter 20 Chapter 21 Chapter 24
9	8	Viral Hepatitis	Hepatitis A Hepatitis B Hepatitis C Hepatitis D Hepatitis E Transfusion transmitted virus Immunologic manifestations	Chapter 23
10	8	Infectious Mononucleosis	Etiology and epidemiology of Mononucleosis Signs and symptoms Immunologic manifestation Heterophil antibodies Epstein-Barr virus serology Mono slide test	Chapter 22
11	9	Hypersensitivity Reactions	Hypersensitivity reactions Type I Immediate hypersensitivity Type II Cytotoxic	Chapter 26

EXAM # 2			hypersensitivity Type III Immune complex reactions Type IV Cell-mediated (delayed) hypersensitivity	
12	9	Autoimmune Disorders, part I	Autoimmunity Factors influencing autoimmunity Self-recognition (tolerance) Organ specific disorders	Chapter 28
13 EXAM #3	10	Autoimmune Disorders, part II	Systemic lupus erythematosus (SLE) Signs and symptoms Immunologic manifestations Rheumatoid arthritis Signs and symptoms Immunologic manifestations Jucveline rheumatoid arthritis (JRA) Rapid latex agglutination	Chapter 29 Chapter 30
14	11	Solid Organ Transplant Bone Marrow Transplant Tumor Immunology	Histocompatibility antigens Transplantation terminology Type so transplants Graft-vs-Host disease Graft rejection Bone marrow transplantation Evaluation of candidates for bone marrow transplant. Benign and malignant tumors Etiologic factors in cancer Role of oncogenes Tumor markers PSA rapid test	Chapter 31 Chapter 32 Chapter 33
15	12			

FINAL EXAM	FINAL EXAM			
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Required Textbooks:

Immunology & Serology in Laboratory Medicine, 4rd Edition
 Mary Louise Turgeon, Mosby, 2009
 ISBN-978-0-323-04382-3

Additional References/Resource Material Available:

Additional books and reference materials are available at the School's Library and at the clinical libraries of the affiliated hospitals. In addition, students will have access to an online library and power point presentations. .

Instructor/Facilitator:

Traditional:

Lori Burkard, M.S., M.T. (ASCP)
 Program Director, School of Clinical Laboratory Science

Distance:

TBA

Method of Evaluation:

Traditional:

Unit Exams	40%
Midterm	30%
Final	30%

Distance:

Quizzes	20%
Discussion posts	20%
Midterm	20%
Final	40%

Outside work and estimated hours to complete:

For every hour of class time, student can expect to spend two hours, outside of class, on reading, studying and completing homework assignments.

Grading Scale

The following is New York Methodist Hospital's grading policy:

Grade	Percent Equivalent	Description	Quality Points
A	90 – 100	Excellent	4.0
B+	85 – 89	Very Good	3.5
B	80 – 84	Good	3.0
C+	75 – 79	Average	2.5
C	70 – 74	Below Average	2.0
D	65 – 69	Poor	1.0
F	0 – 64	Failure	0
P	--	Pass	--
TF	--	Transfer Credits	--
INC	--	Incomplete	0
W	--	Official Withdrawal	--
FW	--	Failure due to Unofficial Withdrawal	0
FT	--	Failure due to Termination	0

Graduation Requirements:

For the School of Clinical Laboratory Science a C average – an index (GPA) of 2.0 – is required for graduation.