Course Code	Course Title	ECTS Credits
IMMU-541	Cellular and Molecular Immunology	8
Department	**Semester**	**Prerequisites**
Life and Health Sciences	Fall	None
Type of Course	**Field**	**Language of Instruction**
Required	Biomedical Sciences	English
Level of Course	**Year of Study**	**Lecturer**
2nd Cycle	1st	Dr. Anastasia Dieti
Mode of Delivery	**Work Placement**	**Co-requisites**
Face to Face	N/A	None

Objectives of the Course:

The aim of this course is to provide a solid inside into the field of Immunology and an overview of the different immunological mechanisms associated with a range of diseases. The course is orientated so as to provide students with an expanded knowledge on the relevance of the components of the immune system in diagnostics and treatment of disease.

Main aims of this course is to:

- Enhance the knowledge of students regarding the cellular and molecular components of the immune system, in terms of their origin, morphology and functions.
- Help students acquire an understanding of the anatomy of the various lymphoid tissues and their involvement in the initiation of adaptive immune responses.
- Enable students to distinguish between innate and adaptive immunity and appreciate the various cellular interactions and pathways involved in the induction and regulation of immune responses.
- Provide students with a better inside into antibody-mediated responses, and appreciate the importance of the dose, nature, and route of administration of antigen in elicitation of response.
- Enhance knowledge about cellular and molecular interactions involved in T-cell and B-cell mediated responses.

Learning Outcomes:

After completion of the course, students will be expected to use the knowledge of current immunological principles to:

- Identify the cells and molecules involved in the immune system.
- Discuss how an immune response is initiated and how cells and molecules interact following exposure to pathogen.
- Characterize the components involved and discuss the effectiveness of innate and adaptive

immune responses and demonstrate knowledge of how these are brought about.

- Explain in detail the processes in T-cell mediated and humoral (B-cell mediated) immune responses.
- Relate the principles functions of the immune system to pathological processes and evaluate the importance of the immune response in disease states.
- Critically analyze, present and discuss the relevant research literature.

Course Contents:

1. Cellular components of the immune system
   - White blood cells, their role and function in innate and adaptive immunity
   - Lymphoid organs and their role in initiation of adaptive immune responses
   - Principles of Innate and Adaptive immunity
   - Insides into Adaptive immunity and its importance in mediating effective responses
2. Induction and manipulation of immune responses
   - Antibody molecules as secreted immunoglobulins
   - Antibody molecules as transmembrane proteins; the B-cell antigen receptor
   - Measuring antibody levels
   - Uses of antibodies in current medicine
   - Antibody-antigen complexes and T cell recognition
   - Insides into the T-cell receptor complex
3. Molecular components of the immune system
   - Generation of B lymphocytes
   - Selection of B cells
   - Generation of T lymphocytes in the thymus
   - Positive and negative selection in the thymus
4. T-cell mediated immunity and Humoral immune responses
   - Production and action of effector T-cells
   - Cytotoxic T-cells and their contribution to adaptive immunity
   - Antibody production and function during humoral immunity
   - The complement cascade

Learning Activities and Teaching Methods:

Lectures; problem based learning, poster and/or oral presentations of medical/research papers. The lecturer will be introducing each topic through lecture presentations. After a set of lectures on a topic, a problem based learning section will follow to encourage learning through collaborative work and literature research. There will be an individual research paper presentation where students will have to discuss and evaluate critically the papers while the lecturer is acting as a

moderator.

Assessment Methods:

Assignments, Presentations, Tests and Mid-term Exam; Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Edition	ISBN
Kenneth Murphy	Janeway's Immunobiology (Immunobiology: The Immune System (Janeway)	Garland Science	8th (July 25th, 2011)	ISBN-10: 0-8153-3642-X ISBN-13: 978-0815342434

Recommended Textbooks/Reading:

Authors	Title	Publisher	Edition	ISBN
Abul K. Abbas MBBS, Andrew H. H. Lichtman MD PhD, Shiv Pillai MD	Cellular and Molecular Immunology: with STUDENT CONSULT Online Access, 7e (Abbas, Cellular and Molecular Immunology) [Paperback]	Saunders	7th (May 23, 2011)	ISBN-10: 1437715281 ISBN-13: 978-1437715286
Raif Geha, Luigi Notarangelo	Case Studies in Immunology: A Clinical Companion (Geha, Case Studies in Immunology: A Clinical Companion) [Paperback]	Garland Science	6th(October 18, 2011)	ISBN-10: 0815344414 ISBN-13: 978-0815344414