

### CORE III IMMUNOLOGY

| Semester | Subject code | Category | Lecture   |          | Theory    |            | Practical |          | Credit |
|----------|--------------|----------|-----------|----------|-----------|------------|-----------|----------|--------|
|          |              |          | Total hrs | Hrs/week | Total hrs | Hrs / week | Total hrs | Hrs/week |        |
| III      |              | Core     | 60        | 4        | 60        | 4          | 0         | 0        | 4      |

#### COURSE OBJECTIVES

To enlighten the students to understand the basics of Immunity and Immune system

#### COURSE OUTCOMES

On the successful completion of the course, students will have deep insight knowledge in immune techniques in therapeutic and diagnostic field.

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To understand about the various basic cells, organs and its function involved in immune system            | <b>K2</b>               |
| <b>CO2</b> | To expertise about the knowledge on antigen and antibody .  | <b>K2</b>               |
| <b>CO3</b> | To understand the therapeutic and diagnostic application and its importance of antigen antibody reaction. | <b>K3</b>               |
| <b>CO4</b> | To gain insight on various immune components like complement, MHC and monoclonal antibody.                | <b>K2</b>               |
| <b>CO5</b> | To categorize the different types of hypersensitivity reaction and its immune background                  | <b>K2</b>               |

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | S   | S   |
| CO2 | S   | M   | S   | S   | S   | S   |
| CO3 | S   | M   | M   | S   | S   | S   |
| CO4 | S   | M   | M   | S   | S   | S   |
| CO5 | S   | M   | S   | S   | S   | S   |

**S- Strong;**

**M- Medium;**

**L- Low**

### **Unit-I: Basics of Immunology**

**12 hrs**

History of Immunology, Immunity - Innate immunity, acquired immunity active and passive immunity, Components of immune system – Primary and secondary lymphoid organ structure and function, Cells of immune system, hematopoiesis, B cells, T cells, granulocyte and agranulocytes, phagocytosis.

### **Unit-II: Antigen and Antibody**

**12 hrs**

Antigens- types, properties, antigenicity and immunogenicity, haptens, adjuvant -Vaccines- live, attenuated, subunit, toxoids, recombinant and DNA vaccine- Immunoglobulin – structures, types and properties- Interferons, Interleukin, cytokines.

### **Unit-III: Immunological techniques**

**12 hrs**

Antigen – Antibody reactions – *in vitro* methods – Agglutination, Immunodiffusion, Electrophoresis, Precipitation, Passive agglutination , Complement fixation, Immunofluorescence, ELISA, RIA, Immunohaematology – Blood groups.

**Unit-IV: Components of Immune system****12 hrs**

Complement - structure properties and functions- Classical and alternate pathways - MHC complex - structures, functions- Hybridoma Technology and its applications- Host Parasite relationship.

**Unit- V Hypersensitivity****12 hrs**

Hypersensitivity: antibody mediated -Type I anaphylaxis, Type II antibody dependent and cytotoxicity, Type III - Immune complex mediated, Type IV - Delayed Type - *In vivo* methods - Skin tests, Immune complex tissue demonstrations.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems - Nil

**TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion
- ❖ Group assignments

**TEXT BOOKS:**

| S.No | Title                             | Author                               | Publisher   | Year of Publication |
|------|-----------------------------------|--------------------------------------|---|---------------------|
| 1    | Immunology                        | D.M. Weir and J Steward              | ELBS, London.   | 1997                |
| 2    | Cellular and Molecular Immunology | A K Abbas, A H Lichtman, Shiv Pillai | 8 <sup>th</sup> Edition<br>Philadelphia:<br>M.B. Saunders | 2014                |

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| S.No | Title                         | Author  | Publisher  | Year of Publication |
|------|-------------------------------|---|--|---------------------|
| 1    | Immunology                    | J Kuby  | W. H. Freeman and Company, New York              | 2019                |
| 2    | Essential Immunology          | I.M Riott   | Blackwell scientific publication, London         | 2017                |
| 3    | Immunology- An Introduction   | Tizard K  | Sauders College Publishing, Philadelphia         | 1994                |
| 4    | Immunology for students       | J H Humphrey, R G White.  | 5 <sup>th</sup> edition ELBS London              | 1995                |
| 5    | Hand book of Lunar Immunology | Lefell, Donnenberg, Rose H<br><a href="#">Maurice R.G. O'Gorman</a> (Editor), <a href="#">Albert D. Donnenberg</a> (Editor) | BOCA Raton Fla; 2 <sup>nd</sup> EditionCRC Press | 2008                |

**WEB SOURCES:**

- ❖ <http://www.immuno.path.cam.ac.uk/~immuno/part1.html>
- ❖ <http://www.lclark.edu/~reiness/immuno/lectures.html>
- ❖ <http://www.hhmi.org/biointeractive/immunology/lectures.html>
- ❖ <http://immuneweb.xxmc.edu.cn/immunology/immunology/html>
- ❖ <http://www.cehs.siu.edu/fix/medmicro/index.html>
- ❖ <http://www.biotech.ubc.ca/teachingresources/microbiologyimmunology/immunesystemnotes.html>

**SYLLABUS DESIGNER:**

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