**SRM University**
**School of Bioengineering**
**Department of Biotechnology**

**B. Tech. Biotechnology**
**II Year/III Semester**
**BT1010 –Immunology**
**Total hours: 45**

# Lesson plan

| Unit | Hours | Lecture Topics | Page Nos. | Reference | Learning Outcomes |
|---|---|---|---|---|---|
| I | 1 -4 | Introduction – overview of the immune system<br>Lymphatic system, Lymphoid organs,<br>Cells of the immune system and their functions, | 1-6<br>55-66<br>40-50 | 1 | After providing basic knowledge of .immunology, its two arms of immunity will be discussed in detail. Further, the external agents that provoke immune responses will be taught. |
| | 5-6 | Immune system-Innate and Acquired immunity | 1-6 | 1 | |
| | 7-8 | Comparative immunity: Anatomical and Physiological barriers;<br>Innate immune response and their recognition structures;<br>Pathogen elimination; Plant Immune system | 35, 22-25<br><br>22-30<br>32-34 | 1 | |
| | 9-10 | Immunogens and Antigens: Requirements for immunogenicity; major classes of antigens; antigen recognition by B and T lymphocytes | 72-81 | 1 | |
| II | 11 | Immunoglobulin structure and function | 89-92 | 1 | Information about humoral immunity, the involvement of B lymphocytes and its product, antibody, in immunity will be explained Monoclonal antibody production and its use in therapy and diagnosis will be taught. |
| | 12 | Antibody classes and biological activities | 92-96 | 1 | |
| | 13-14 | Monoclonal antibodies | 323-329 | 1 | |
| | 15-18 | B Cell differentiation and B cell receptor;<br>Ab diversity: Genetic basis;<br>B cell signal transduction | 142,150<br>98,154-166<br>228,229,232-235 | 1 | |
| | 19 | Cytokine | 207-216 | 1 | |
| | 20 | Complement system | 252-257, 259,260 | 1 | |
| | 21-22 | Isolation of immune cells from Human and animals;<br>Antigen- antibody interaction –antibody affinity and activity- precipitation reaction, agglutination reaction | 289-293<br>294-301 | 1 | A basic understanding about the various immunological techniques will be taught. |

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| III | 23-24 | Radio-immunoassay, ELISA,<br>Western Blot, Immunoprecipitation | 304,305-308<br>309, 294-296 | 1 | Another important topic of MHC that governs antigen processing will explained. |
| | 25 | Immunofluoresence,<br>flow cytometry | 308<br>154-155 | 1<br>2 | |
| | 26-28 | Cell culture and experimental models, analysis of gene expression | 528-552 | 2 | |
| IV | 29-31 | MHC, antigen processing and presentations | 119,123,<br>127-128,<br>176-179 | 1 | The ways through which T and B lymphocytes get activated so that they can play a role in the elimination of antigens will be discussed. |
| | 32 | T-cell receptors | 179,192-194 | 1 | |
| | 33-35 | T-cell maturation, activation and differentiation; | 171-175, 194-201 | 1 | |
| | 36-37 | Cell mediated effector responses - Function of CD8+ T cells. | 185-187 | 1 | |
| V | 38 | Hypersensitive reactions | 281-281, 450-463 | 1 | Some of the diseases that involve the innate and acquired immunity will be taught along with current vaccine strategies used. |
| | 39 | Immune responses to infectious diseases | 339-342, 359-361 | 1 | |
| | 40-41 | Vaccines | 485-494,<br>495,498,499 | 1 | |
| | 42-45 | Tumor immunology and auto immunity | 421-426, 435,<br>440-445 | 1 | |

**Text Book:**

1. Sudha Gangal and Shubhangi Sontakke, “Textbook of basic and clinical immunology”. Universities Press (India) Pvt. Ltd. 2013.
2. Thomas J. Kindt, Barbara A. Osborne, Richard A. Goldsby, "Kuby Immunology," Sixth edition, W.H.Freeman and Company, 2006.

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