**VACCINOLOGY CREDIT HOURS2+1**

**LEARNING OUTCOMES:**

**The students will be able to:**

1. Know about the methods of vaccine preparation
2. gain the Knowledge that how vaccines work immunologically and epidemiologically
3. Know the different types of vaccines and guidelines for current vaccination practices
4. critically discuss the advantages and disadvantages of vaccines

**COURSE CONTENTS:**

Introduction to vaccinology, the history of vaccine development (Small pox, Measles, Tetanus, polio, rabies, hepatitis), Concept and scope of vaccines. Principles of Vaccines design, Strategies to stimulate innate immunity, Antigen processing and [major histocompatibility complex, Mucosal Immune system and Mucosal Vaccine design, utility of animal models in vaccine design, Antigen Engineering, Attenuated bacterial vaccines, Recombinant MVA vaccines, Recombinant Adenoviruses and Avipox viruses for vaccination](https://en.wikipedia.org/wiki/Major_histocompatibility_complex), Nucleic acid vaccination. Applications of vaccines, infectious diseases, cancer specific antigens, prophylactic cancer vaccines. Vaccine Delivery Systems, Transcutaneous immunization, Needle free jet injection, Oral vaccines, Biodegradable particles, Co-stimulatory Moieties, Vaccine safety and ethics.

**PRACTICALS:**

1. Preparation of attenuated cultures
2. Chick embryo inoculation for vaccine development
3. Effect of different available vaccines in animal models
4. Antibody titre for different antigenic vaccines

**RECOMMENDED BOOKS:**

1. Centlivre, Mireille, & Combadière, Béhazine. 2015. New challenges in modern vaccinology. (BioMed Central Ltd.) BioMed Central Ltd.
2. Giese, M. 2016. Introduction to molecular vaccinology. Cham : Springer
3. Milligan, G. N., & Barrett, A. D. T. 2015. Vaccinology: An essential guide. NJ : Wiley Blackwell

Stanley, P., 2014. Vaccinia, Vaccination, and Vaccinology. Springer Verlag.