**PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY, PANIPAT**

**DEPARTMENT OF PHARMACY**

**Course: B.Pharmacy**

**LESSONPLAN**

**Faculty Name: Dr. Neelam Malik** **Class: B. Pharmacy –6th semester**

**Subject :Pharmaceutical Medicinal Chemistry –II** **Subject Code: BP601T**

**Scope of the Subject:** This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasis on modern techniques of rational drug design like quantitative structure activity relationship (QSAR), Prodrug concept, combinatorial chemistry and Computer aided drug design (CADD). The subject also emphasizes on the chemistry, mechanism of action, metabolism, adverse effects, Structure Activity Relationships (SAR), therapeutic uses and synthesis of important drugs.

**Course outcome:** Upon completion of the course student shall be able to

- Understand the importance of drug design and different techniques of drug design.
- Understand the chemistry of drugs with respect to their biological activity.
- Know the metabolism, adverse effects and therapeutic value of drugs.
- Know the importance of SAR of drugs.

- **Number of Lectures**: 45 + 5
- **Each lecture**: 01 hour

| Lecture No. | Particular | Remark/Date |
|---|---|---|
| **Introduction** | | |
| 1. | General discussion about basic concepts of Medicinal chemistry | |
| **Unit 1** | | |
| **Module 1: Antibiotics** | | |
| 2. | Historical background, Nomenclature, Stereochemistry of β-Lactam antibiotics. | |
| 3. | Structure activity relationship, Chemical degradation classification of β-Lactam antibiotics. | |
| 4. | Historical background, Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification of Penicillin and Cepholosporins, | |
| 5. | Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification of β-Lactamase inhibitors, and Monobactams | |
| 6. | Structure activity relationship, Chemical degradation classification of Streptomycin | |
| 7. | Structure activity relationship, Chemical degradation classification of Neomycin and Kanamycin. | |
| 8. | Structure activity relationship, Chemical degradation classification of Tetracycline and Oxytetracycline | |
| 9. | Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification of | |

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| | Chlortetracycline. | |
| 10. | Historical background, Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification of<br>Minocycline and Doxycycline | |
| **UNIT -ll** | | |
| **Module 2: Antibiotics** | | |
| 11. | Macrolide**:** Erythromycin Clarithromycin, Azithromycin.<br><br>Historical background, Nomenclature, Stereochemistry, | |
| 12. | Structure activity relationship, Chemical degradation classification of macrolides | |
| 13. | Miscellaneous: Chloramphenicol, Clindamycin | |
| 14. | Basic concepts and application of prodrugs design | |
| **Module 3: Antimalarials** | | |
| 15. | Etiology of malaria. | |
| 16. | SAR of Quinolines | |
| 17. | Historical background, Nomenclature, Stereochemistry of Quinine sulphate, Chloroquine, Amodiaquine and Primaquine phosphate. | |
| 18. | Historical background, Nomenclature, Stereochemistry of Pamaquine, Quinacrine hydrochloride, Mefloquine | |
| 19. | Biguanides and dihydro triazines**:** Cycloguanil pamoate, Proguanil. | |
| 20. | Miscellaneous: Pyrimethamine, Artesunete, Artemether, Atovoquone. | |
| **UNIT-lll** | | |
| **Module 4: Anti-tubercular Agents** | | |
| 21. | Synthetic anti tubercular agents:, Ethionamide, Ethambutol, Pyrazinamide, Para amino salicylic acid | |
| 22. | Anti tubercular antibiotics: Rifampicin, Rifabutin, Cycloserine Streptomycine, Capreomycin sulphate. | |
| 23. | Synthesis of Isoniozid , Streptomycine, Capreomycin sulphate. | |
| **Module 5: Urinary tract anti-infective agents** | | |
| 24. | SAR of quinolones. | |
| 25. | **Quinolones:** Nalidixic Acid,Norfloxacin, Enoxacin, Ofloxacin, Lomefloxacin, Sparfloxacin, Moxifloxacin and Gatifloxacin, | |
| 26. | Miscellaneous: Furazolidine, , Methanamine | |
| 27. | Synthesis of Ciprofloxacin and Nitrofurantoin | |
| **Module 6: Antiviral agents** | | |
| 28. | Amantadine hydrochloride, Rimantadine hydrochloride, | |
| 29. | Idoxuridine trifluoride, Acyclovir, Gancyclovir, Zidovudine, Didanosine, | |
| 30. | Zalcitabine, Lamivudine, Loviride, Delavirding, Ribavirin, Saquinavir, Indinavir, Ritonavir. | |
| **UNIT IV** | | |
| **Module 7: Antifungal agents** | | |

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| 31. | Antifungal antibiotics: Amphotericin-B, Nystatin, Natamycin, Griseofulvin | |
| 32. | Study of Synthetic Antifungal agents and its compounds | |
| 33. | Study of Anti-protozoal Agents along with its compounds | |
| 34. | Study of Anthelmintics and its products | |
| 35. | Study of Sulphonamides and Sulfones | |
| 36. | Study of Folate reductase inhibitors and its compounds | |
| 37. | Sulfones**:** Dapsone | |
| 38. | Synthesis and reaction of Miconazole, Metronidazole, Diethylcarbamazine citrate*, Thiabendazole, Mebendazole | |
| **UNIT V** | | |
| **Module 8: Introduction to Drug Design** | | |
| 39. | Various approaches used in drug design. | |
| 40. | Physicochemical parameters used in quantitative structure activity relationship (QSAR) | |
| 41. | Hansch analysis. | |
| 42. | Hammet's electronic parameter and Tafts steric parameter | |
| 43. | Pharmacophore modeling and docking techniques. | |
| 44. | Concept and applications combinatorial chemistry | |
| 45. | Solid phase and solution phase synthesis | |
| **Revision** | | |
| 46. | Revision of Unit 1 with previous question paper | |
| 47. | Revision of Unit 1l with previous question papers | |
| 48. | Revision of Unit lll with previous question papers | |
| 49. | Revision ofUnit 1V with previous question papers | |
| 50. | Revision of Unit V with previous question papers | |

**Teacher in-charge** **HOD** **Principal**