**FACULTY OF PHARMACY**
**Sixth Semester Bachelor of Pharmacy**
**In Effect from Academic Year 2018-19**

| **Subject Code:** 1PH1010604 | **Subject Title:** PHARMACEUTICAL CHEMISTRY – VIII (MEDICINAL CHEMISTRY – II) |
|---|---|
| **Pre-requisite Subject** | **- NONE -** |

**Objectives of course:**
To make students familiar with basics of receptors and drug action on receptors and metabolism of drugs.

**Learning outcomes:**
At the end of semester student will be able to:

- Students would understand the details of drugs acting on CNS
- Students would get basic knowledge about the medicament used in diseases related CNS
- Students would get better idea that how drug metabolism will affect the drug design

| **Teaching Scheme (Hours per week)** | | | | **Evaluation Scheme (Marks)** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Theory(T)** | | **Practical(P)** | | **Total Marks** | |
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **University Assessment** | **Continuous Assessment** | **University Assessment** | **Continuous Assessment** | **Theory** | **Practical** |
| 3 | NA | 3 | 6 | 80 | 20 | 80 | 20 | 100 | 100 |

| **Subject Contents** | | | |
|---|---|---|---|
| **Sr. No.** | **Topic** | **Total Hours** | **Weight (%)** |
| 1 | **Receptors and Drug action:**<br>• Types of receptors.<br>• Theories of Drug-Receptor Interactions<br>• Various forces involved in drug-receptor interaction.<br>• Factor affecting the drug-receptor interaction. | 4 | 9 |
| 2 | **Drug metabolism**<br>a) Introduction, Xenobiotics, Site of drug metabolism, Phase-I and Phase-II Metabolism in detail, overview about CYP450 and its importance, Factor affecting drug metabolism, importance of drug metabolism in drug design | 11 | 24 |
| 3 | Introduction, history, classification, nomenclature, mechanism of action, adverse effects, therapeutic uses, structure activity relationship (SAR), synthetic procedures of selected drugs and recent developments of following categories to be covered | | |
| | **Drugs Acting on CNS:** | | |
| | **CNS stimulants:**<br>Analeptics, Antidepressants, Hallucinogens<br>• SAR:- Tricyclic antidepressants<br>• Synthesis:- Amphetamine, Fluoxetine, Imipramine | 5 | 11 |
| | **CNS Depressants:**<br>General and local anesthetics, Sedative and Hypnotics, Anxiolytics, Antiepileptics, Antipsychotics<br>• SAR:- Benzoic acid and Aniline derivatives with Local anesthetic activity, Barbiturates, Benzodiazepines, Phenothiazines, Butyrophenones<br>• Synthesis:- Halothane, Lignocaine, Thiopental sodium, Phenobarbitone, Chlordiazepoxide, Phenytoin, Carbamazepine, Chlopromazine | 13 | 29 |
| | **Antiparkinson's agents** | 2 | 4 |

| | | | |
|---|---|---|---|
| | • Synthesis: L-Dopa | | |
| | **Non Steroidal Anti-Inflammatory Agents, Anti Gout and DMARDS:**<br>• Synthesis:- Paracetamol, Aspirin, Diclofenac, Ibuprofen, Indomethacin, Allopurinol, Mefenamic acid, Nimesulide, Naproxen | 7 | 16 |
| | **Alzheimer's disease** | 2 | 4 |
| | **Cognition enhancers** | 1 | 2 |

**List of Experiments: (45 Hours)**

| Sr. No. | Contents | No. of Practical Hours |
|---|---|---|
| **A** | **Separation and qualitative analysis of Organic binary mixtures containing water insoluble components having salt, acidic, phenolic, amphoteric, basic and neutral nature (Solid + Solid, Solid + liquid, Liquid + liquid and Eutectic mixtures) with derivative preparations.**<br>**1)** Salts (sodium benzoate, Sodium salicylate etc.)<br>**2)** Acids (Benzoic acid, salicylic acid, cinnamic acid, acetyl salicylic acid etc.)<br>**3)** Phenols (α-Naphtol, β-Naphtol, o/m/p-nitrophenol, Phenol, o/m/p-cresol etc.)<br>**4)** Strong acidic amphoterics (P-amino benzoic acid, o-amino benzoic acid, sulphanilic acid etc.) and weak acidic amphoteric (Sulphanilamide etc.)<br>**5)** Bases (α-Naphthylamine, o/m/ p-anisidine, diphenyl amine, o/m/p-nitroaniline, Aniline, N-methyl aniline, N, N-dimethyl aniline etc.)<br>**6)** Neutrals (Benzophenone, Benzaldehyde, Acetophenone, Nitrobenzene, m-dinitrobenzene, acetanilide, benzamide, naphthalene etc.) | 33 |
| 1. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 2. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 3. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 4. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 5. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 6. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 7. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 8. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 9. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 10. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| 11. | Separation and qualitative analysis of Organic binary mixtures with derivative preparation | |
| **B.** | **Synthesis of some organic compounds:** | 12 |
| 12. | Aspirin | |
| 13. | Paracetamol | |
| 14. | Methyl salicylate | |
| 15. | Phenytoin | |

**List of References:**
**Reference books:**

1. J. N. Delagado and W. A. R. Remers, edn, Wilson and Giswolds Textbook of Organic Medicinal and Pharmaceutical Chemistry, J. Lippincott Co. Philadelphia
2. W. C. Foye, Principles of Medicinal Chemistry, Lea and Febiger, Philadelphia
3. H. E. Wolff, edn, Burgers Medicinal chemistry, John Wiley and sons, New York Oxford University Press, Oxfords
4. Daniel Lednicer, Strategies for organic drug synthesis and design, John Wiley and Sons USA

5. B. N. Ladu, H. G. Mandel and E. L. Way. Fundamentals of Drug Metabolism and Disposition. William and Willkins co. Baltimore

**Text books:**

1. Vogel's Text books practical organic chemistry, ELBS/Longman, London
2. Mann and Saunders, Practical organic chemistry, Orient Longman, UK
3. Shriner, Hermann, Morill, Curtin and Fusion. The Systematic Identification of Organic Compounds, John Wiley and Sons
4. Hans Thacher Clarke, A Handbook of Organic Analysis Qualitative and Quantitative, Fourth edition, Orient Longmans Ltd.
5. Arthur Vogel, Elementary Practical Organic Chemistry, Part-I and II, Second edition, CBS Publisher

**e- Resources:**

1. http://www.uio.no/studier/emner/matnat/kjemi/KJM5230/h08/undervisningsmateriale/KJM5230kap4.pdf
2. http://www.kau.edu.sa/Files/0053627/Subjects/drug%20metabolism-1.pdf
3. https://www.medicalnewstoday.com/articles/159442.php
4. https://bebrainfit.com/cognitive-enhancers/