GUJARAT TECHNOLOGICAL UNIVERSITY BACHELOR OF PHARMACY

SEMESTER: V

Subject Name: Pharmaceutical Chemistry – VI (Medicinal Chemistry)

| Sr. No. | Course contents | Proposed No. of Hours of Teaching |
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| 1. | An introduction to the subject of medicinal chemistry History and development of medicinal chemistry, Drug therapy | 2 |
| 2. | Physiochemical properties of drug molecules influencing biological activity a. Solubility, Partition coefficient, Hydrogen bonding, Complexation, lonisation, Redox potential, Surface activity and protein binding b. Stereochemical features of drugs: geometric and optical isomers Bioisosterism | 10 |
| 3. | Heterocyclic compounds: Chemistry, preparation and properties of a. Furan, thiophene, pyrrol and pyridine b. Pyrrazole, imidazole, oxazole, isoxazole and thiazole c. Pyrazine, pyridazine and pyrimidine Quinoline, isoquinoline and indole | 10 |
| 4. | A study history, development, structure activity relationship, mechanism of action and synthesis* of following classes of drugs (*Synthesis of drugs mentioned in each category) i. Drugs acting on respiratory tract a. Antiasthmatics b. Expectorants c. Antitussive agents d. Respiratory stimulants e. Mucolytics f. Decongestants ii. Drugs acting on gastrointestinal tract a. Antacids b. Antisecretary (Ranitidine) c. Proton pump inhibitors (Omeprazole) d. Antiemetics e. Antidiarrheals f. Laxatives | 7 |
| | g. Prokinetics h. Antispasmodics and drug modifying intestinal motility i. Drugs for irritable bowel syndrome j. Local colorectal preparations k. Enzymes, carminatives and hepatobiliary preparations iii. Autocoids a. Histamines and antihistamines, Histamine receptors, H ₁ antagonists, H ₂ antagonists (histamines, diphenhydramine, tripelenamine,chlorcylclizine, trimeprazine, chlorpheniramine, promethazine, cyproheptadiene, antazoline, cetrizine) b. Eicosanoids: history and discovery, eicosanoids biosynthesis, drug | 8 |

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Medicinal Chemistry – I – Practical 3 hr/week:

- 1. Organic spotting of solid-solid binary mixtures including eutectic mixture.
- 2. Synthesis of some organic compounds including some heterocyclic compounds.
- 3. Workshops on stereo models using some selected drugs

References 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
- 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
- 6. I. L. Finar. Organic chemistry Vol. I and Vol. II. ELBS/Longman, London
- 7. Vogels Text books practical organic chemistry, ELBS/Longman, London
- 8. Mann and Saunders, Practical organic chemistry, Orient Longman, UK
- 9. Shriner, Hermann, Morill, Curtin and Fusion. The systematic identification of organic compounds, John Wiley and Sons