Enclosure-IX

Sarvodaya Kelavani Samaj managed,

Shri Manibhai Virani and Smt. Navalben Virani Science College

(Autonomous)

(Affiliated to Saurashtra University, Rajkot)

Re-Accredited at 'A' Level by NAAC

STAR college Scheme & Status by MST-DBT

UGC- College with Potential for Excellence (CPE)

UGC-DDU KAUSHAL Kendra

GAAA –Grade A-1 by KCG, Government of Gujarat

GPCB-Government of Gujarat approved Environment Audit Center

Nodal Center for capacity building by GSBTM

Syllabi for the DSE-ID Course offered to
M.Sc. Industrial Chemistry
Semester-II

Syllabus

DSE-ID-Offering to M.Sc. Industrial Chemistry

Semester-II

Department: Industrial Chemistry Programme: M.Sc IC

Semester - II		
Course Code	**Course Title**	**Course Credit and hrs**
19PICID202	**DSE-ID 2: Medicinal Chemistry-I**	**4 Credits - 4 hrs / wk**

Course Outcomes: Upon completion of this course, the learner will be able to		
CO No.	**CO Statement**	**Blooms taxonomy Level (K_1 to K_6)**
CO_1	Understand and describe process of drug discovery.	K1, K2
CO_2	Explain Clinical Trials for the drug development	K1, K2
CO_3	Design and optimize lead molecules	K2, K3
CO_4	Predict and describe, Quantitative structure activity relationship (QSAR)	K2, K3
CO_5	Illustrate concept of combinatorial library for drug development.	K4

Course Content **Hours**

Module-I: Introduction to drug discovery: 08 hrs

History and development of medicinal chemistry, drugs and their important, drug discovery and development process (Timeline), Trends in Drug Discovery and Development, Clinical Studies: Phase 1, 2, & 3 clinical trials, evaluations, post clinical trials, filing of NDA.

Module-II : Lead discovery: 10 hrs

Lead discovery from natural sources, lead discovery through random screening, nonrandom (or targeted or focused) screening, drug metabolism studies, clinical observations, rational approaches to lead discovery.

Module-III : Lead Modification: 12 hrs

Identification of the Active Part: the pharmacophore, functional group modification. Structure–activity relationships, privileged

structures and drug-like molecules. Structure modifications to increase potency and the therapeutic index: Homologation, chain branching, ring-chain transformations, bioisosterism.

Module-IV : QSAR: 10 hrs

Introduction to quantitative structure–activity relationships (QSARs), lipophilicity, partition coefficients (P), lipophilic substitution constants (p), electronic effects, The Hammett constant (s), steric effects, The Taft steric parameter (Es), molar refractivity (MR), other parameters. Hansch analysis, Craig plots, The Topliss decision tree.

Module-V : Combinatorial Chemistry: 08 hrs

The principle and design of combinatorial chemistry, pool and split method for peptide synthesis, parallel synthesis, Furka's mix and split technique, Solid support method.

Suggested laboratory experiments:

- NA

Pedagogic tools:

- Chalk and Board, Power point presentation, models
- LCD and Videos.

Text book:

1. Introduction to Medicinal Chemistry, A. Gringuage, Wiley-VCH.
2. Wilson and Gisvold's Text Book of Organic Medicinal and Pharmaceutical Chemistry, Ed Robert F. Dorge.
3. Morrison & Boyd (2009, Sixth edition) *Organic Chemistry*. New Jersey: Pearson Education (ISBN: 978-81-7758-169-0).

Reference Books:

1. An Introduction to Drug Design, S. S. Pandey and J.R. Dimmock, New Age International.
2. Burger's Medicinal Chemistry and Drug Discovery, Sixth Edition, Ed.M.E.vWolff, John Wiley.
3. Goodman and Gilman's Pharmacological Basis of Therapeutics, McGraw-Hill.
4. The Organic Chemistry of Drug Design and Drug Action, R. B. Silverman, Academic Press.
5. Strategies for Organic Drug Synthesis and Design, D. Lednicer, John Wiley. Pharmaceutical Substances., Kleemann, Vol-I & II., Fourth edition., Thieme

Laboratory Manual/ Book

- Not applicable.

Suggested reading / E-resources

- Medicinal Journal

Methods of assessing the Course Outcomes

- Continuous Internal Assessment (CIA)
- Semester End Evaluation (SEE)

Component of CIA

Sr. No	CIA Component	Content	Duration	Marks	Total Marks
1	Test-I	Two Modules	1.5 hrs	5 (Set for 30)	20
	Test-II	All modules	3 hrs	15 (Set for 60)	
2	Assignment	-	-	10 (Mark on 20)	30
3	Class Activity	-	-	20	
					50