INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
भारतीय प्रौद्योगिकी संस्थान तिरुपति
Yerpedu-Venkatagiri Road, Yerpedu Post, Tirupati District, Andhra Pradesh - 517 619

1.	Title of the course	Chemistry for Engineers
2.	Course number	CY104L
3.	Structure of credits (L-T-P-C)	2-1-0-3
4.	New course/modification to	Modified with CY102L/ORGANIC AND INORGANIC CHEMISTRY
5.	To be offered by	Chemistry
6.	Prerequisite	None
7.	**Course Objective(s):** To state a molecular level understanding of different physical and chemical processes. To discuss the fundamentals of thermodynamics, chemical kinetics, selected organic reactions and their applications and mechanisms, transition metal chemistry, organometallics, bioinorganic chemistry, and basic spectroscopic techniques.	
8.	**Course Content:** Thermodynamics: laws, state and path functions and their applications, thermodynamics of physical and chemical processes, Maxwell's relations, spontaneity and equilibria, Phase transitions: phase equilibria and phase rule, Kinetics: molecularity and order, mechanism of parallel, opposing, chain and consecutive reactions, steady-state approximations, Arrhenius equation, enzyme kinetics, Aromatic electrophilic substitution reactions: Friedel-Crafts reactions, halogenation, nitration, sulfonation, Aliphatic nucleophilic substitution reactions, Addition reactions: electrophilic addition to alkenes and alkynes, Transition metal chemistry: isomerism, valence bond theory and crystal field theory, Organometallics: 18 electron rules, nitrosyls, carbonyls, catalysis, Bioinorganic chemistry: heme and non-heme oxygen carriers, Minamata disease, Introduction to ultraviolet-visible and infrared spectroscopy.	
9.	**Textbook(s):** 1. Atkins P W and de Paula J, Atkin's Physical Chemistry, 10th Edition, Oxford University Press (2014). 2. Solomons T W G, Fryhle C B and Snyder S A, Solomons's Organic Chemistry, 12th Edition, Wiley (2017).	
10.	**Reference(s):** 1. Huheey J E, Keiter E A, Keiter R L and Medhi O K, Inorganic Chemistry: Principles of Structure and Reactivity, 5th Edition, Pearson (2022). 2. Castellan G W, Physical Chemistry, 3rd Edition, Narosa Publishing House (2004). 3. Clayden J, Greeves N and Warren S, Organic Chemistry, 2nd Edition, Oxford University Press (2014). 4. Pavia D L, Lampman G M, Kriz G S and Vyvyan J A, Introduction to spectroscopy, 5th Edition, Cengage Learning (2014).	