Programme: M. Sc. (Chemistry, Part-II) Course Code: OCO-504 Title of the Course: Retrosynthesis in Organic Chemistry Number of Credits: 3

Prerequisites for the course:         Should have studied the synthetic organic chemistry at M. Sc. part-I (Chemistry) levels and part II organic level CHOC-501, 502, 503 and 504 courses.           Course Objective:         1. Study of various logical steps related to planning of organic synthesis.         2. To apprehend the complexity of synthesis of complex organic molecules.           3. To apply the knowledge gained in organic synthesis for making new molecules.         3. To apply the knowledge gained in organic synthesis for making new molecules.           Course Outcome         1. Students should be in a position to understand how retrosynthesis can be used in finding out easily available chemical precursors for making organic molecules.         2 hours           Content:         1. Introduction to disconnection 2. One-Group disconnection 3. Disconnection of simple alcohols 2.2 Compounds derived from alcohols.         2 hours 3 hours           2.4 Disconnection of simple alcohols 2.5 Disconnection of simple letones 2.6 Control 2.7 Disconnection of simple ketones 3.6 Control 3. Two-group disconnection 3.1 1.3-Dioxygenated Skeletons 3.2 B Hydroxy carbonyl compounds 3.3 a.b-Unsturated carbonyl compounds 3.4 Review problems 3.5 1.5-Diarbonyl compounds 3.6 Mannich reaction 3.7 Summary and revision         4 hours           4 hours         3.1 The 1.2-Dioxygenated Pattern (a) a.4 Hydroxy carbonyl compounds         8 hours	Number of Credits: 3	Effective from AY	: 2019-20
sourse:       part-I (Chemistry) levels and part II organic level CHOC-501, 502, 503 and 504 courses.         Course Objective:       1. Study of various logical steps related to planning of organic synthesis.         2. To apprehend the complexity of synthesis of complex organic molecules.       3. To apply the knowledge gained in organic synthesis for making new molecules.         Course Outcome       1. Students should be in a position to understand how retrosynthesis can be used in finding out easily available chemical precursors for making organic molecules.         2. Students should be in a position to apply various reactions in constructions of simple to complex molecules.       2 hours         3. To apportend to disconnection       2 hours         2. Students should be in a position to apply various reactions in constructions of simple to complex molecules.       2 hours         2. Doe-Group disconnection       2 hours         3. Doe-Group disconnection       3 hours         2.1 Disconnection of simple alcohols.       2.2 Compounds derived from alcohols.         2.2 Compounds derived from alcohols.       2.3 Review problems.         2.4 Disconnection of simple ketones and acids       2 hours         3. Two-group disconnection       4 hours         3. Two-group disconnection       3. a.b-Unsaturated carbonyl compounds.         3.4 Review problems       3.5 1.5-Diacrbonyl compounds.         3.5 Mamint reacition       3.7 Summary and revision	Prerequisites for the	Should have studied the synthetic organic chemistry at M. Sc.	
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<ul> <li>4. 'Illogical' Two group disconnection</li> <li>4.1 The 1,2-Dioxygenated Pattern</li> <li>(a) a-Hydroxy carbonyl compounds</li> </ul>		3.7 Summary and revision	
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		(a) a-Hydroxy carbonyl compounds	

	(b) 1,2-Diols	
	(c) 'Illogical' Electrophiles	
	(d) Review problems	
	4.2 The 1,4-Dioxygenated Pattern	
	(a) 1,4-Dicarbonyl Compounds	
	(b) Y-Hydroxy Carbonyl Comppunds.	
	(c) Other 'Illogical' Synthons	
	(d) Review Problems	
	4.3 1,6-Dicarbonyl compounds	
	4.4 Synthesis of lactones, Review Problems	
	5. General review problems.	2 hours
	6. Pericyclic reactions: problems	2 hours
	7. Heteroatom and heterocyclic compounds	3 hours
	7.1 Ethers and amines	
	7.2 Heterocyclic compounds	
	7.3 Amino acids	
	7.4 Review problems	
	8. Special methods for small rings.	2 hours
	8.1 Three-Membered Rings.	
	8.2 Four-membered rings.	
	8.3 Review Problems	
	9. General review problems.	2 hours
	10. Strategy	8 hours
	10.1 Convergent synthesis	
	10.2 Strategic Devices	
	(a) C-Heteroatom Bonds.	
	(b) Polycyclic compounds: The Common Atom	
	Approach	
	10.3 Considering All Possible Disconnections,	
	10.4 Alternative FGI's Before Disconnection- The	
	Cost of Synthesis	
	10.5 Features Which Dominate Strategy,	
	10.6 Functional Group Addition	
	10.7 Molecules with Unrelated Functional Groups.	
	10.8 Revision Problems.	
Pedagogy:	Lectures & tutorials. Seminars / assignments / presentations /	
<del></del>	self-study or a combination of some of these could also be used	
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	to some extent	
References/Readings	1. S. Warren, Designing Organic Synthesis, John Wiley &	
	Sons.	
	2. G. S. Zweifel & M. H. Nantz, Modern Organic Synthesis:	
	An Introduction, W.H. Freeman and Company, New	
	York.	
	3. J. Clayden, N. Greeves & S. Warren, Organic Chemistry,	
	Oxford, 2016.	