## STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: November 2023 - April 2024

**Department** : Chemistry

Name/s of the Faculty : New Faculty & Dr K. Vidya\*

Course Title : Synthetic Organic Chemistry and Natural Products

Course Code : 19CH/PC/SO44

Shift II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23, 2023 (Day Order 1 & 2) 1 hour	Unit 1 Strategies for Synthesis 1. 1 Definitions, Synthonsand Synthetic Equivalents,	Lecture & Discussion	Warren,Stuart. S. Organic Synthesis- the Disconnection Approach. New York:Wiley, 2013. Jonathan,Clayden,Nick Greeves, Stuart Warren.Organic Chemistry.New York: Oxford University Press, 2012. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York:Springer, 2007.	Short answer test
*1 hour	Unit 4 Alkaloids, Terpenoids and Steroids 4.1 Classification -	Lecture & Discussion	Norman, R.O.C and J.M.Coxon.Principles of Organic Synthesis.New York: CRC Press, 2012.  Chatwal,Gurdeep R. Organic Chemistry of Natural Products Volume I, Mumbai: Himalaya Publishing House,2010.  Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000.	Worksheet
Nov 24-30, 2023 (Day Order 1	1.1 Guidelines, Functional Group Interconversion and Planning for Synthesis of Organic Compounds	Lecture & Discussion	Warren, Stuart. S. Organic Synthesis- the Disconnection Approach. New York: Wiley, 2013. Jonathan, Clayden, Nick	Worksheet

to 6)			Greeves, Stuart	
3 hours			Warren.Organic	
			Chemistry.New York: Oxford	
			University Press, 2012.	
*3 hours	4.1 General Methods of Structure Determination of Alkaloids Contd General Methods of Structure Determination of Terpenoids	Lecture & Discussion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Worksheet
Dec 1-7, 2023	1.2 Disconnection	Lecture	Warren,Stuart. S. Organic	Quiz
1-7, 2023	Approach – One	&	Synthesis- the Disconnection	Quiz
(Day Order 1	Group C-X, Two	Discussion	Approach. New York: Wiley,	
to 6)	Group C-X, One Group C-C and Two		2013.	
3 hours	Group C-C		Jonathan, Clayden, Nick	
	Disconnections		Greeves, Stuart	
			Warren.Organic Chemistry.New York: Oxford University Press, 2012.	
			Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York: Springer, 2007.	
*3 hours	4.1. Could Count			
	4.1 Contd General Methods of Structure Determination of Steroids	Lecture & Discussion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Worksheet

Dec 8-9, 2023  (Day Order 1, 3)  3 hours	1.3 Chemoselectivity, Reversal Polarity (Umpolung) and Ammine Synthesis 1.4 Protection and Deprotection – Alcohols, Carbonyls	Lecture & Discussion	Warren, Stuart. S. Organic Synthesis- the Disconnection Approach. New York:Wiley, 2013. Jonathan,Clayden,Nick Greeves, Stuart Warren.Organic Chemistry.New York: Oxford University Press, 2012.	Short Answer
			Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York :Springer, 2007.	
*3 hours	4.2 Structural Elucidation of Papaverine and Reserpine (Alkaloids),	Lecture & Discussion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Test
Dec 11-15, 2023 (Day Order 2 to 6) 3 hours	1.4 Protection and Deprotection – Carboxylic Acids and Amino Functional Groups 1.5 Retrosynthetic Analysis-Alternate Synthetic Routes.	Lecture & Discussion	Bhat, V. Sujata ,Bhimsa A. Nagasampagi, Meenakshi Siva Kumar. Chemi stry of Natural Products ,India: Narosa, 2005	Quiz
*3 hours	4.2 Structural Elucidation of Zingiberine and Longifolene (Terpenoids)	Lecture & Discus sion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Test

Dec 16 – 22,	1.5 Synthesis of Organic Mono and Bifunctional	Lecture &	Sanyal,S.N. Reactions,	Other
(Day Order 1 to 6) 3 hours	Compounds Via	Discussion	Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York:Springer, 2007.	Component Test (15 marks)
*3 hours	4.3 Constitution of Cholesterol – Structure of the Nucleus, Position of the Hydroxyl Group	Lecture & Discussion	Chatwal, Gurdeep R. Organic Chemistry of Natural Products Volume I, Mumbai: Himalaya Publishing House, 2010 Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000	Quiz
Jan 3 – 6, 2024 (Day Order 1 to 4) 2 hours	1.6 Stereochemical Control of Products- Selective Aldol and Michael Reactions	Lecture & Discussion	Sanyal,S.N. Reactions, Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York:Springer, 2007.	Test
*2 hours	4.3 Contd Double Bond, nature and position of the side-chain, position of the angular methyl Group	Lecture & Discus sion	Chatwal, Gurdeep R. Organic Chemistry of Natural Products Volume I, Mumbai: Himalaya Publishing House, 2010	Other Component Test (10)

	C.A. Test – I			
Jan 8 – 12, 2024				
	Unit 2 (14 Hours) Novel Reagents in Organic	Lecture &	Sanyal,S.N. Reactions, Rearrangements and	Test
(Day Order 1) 1 hours	Synthesis 2.1 Organic Reagents for functional group transformations –	Discussion	Reagents.New Delhi:BharathiBhawan ,2006.	
Jan 18 -20,	<b>2.1</b> chiral diboranes	Lecture	Sanyal,S.N. Reactions,	Test
2024	(asymmetric synthesis),	&	Rearrangements and	
(Day Order 4 to 6)  1 hours		Discussion	Reagents.New Delhi:BharathiBhawan ,2006. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York:Springer, 2007.	
*2 hours	Unit 5 Heterocyclic Compounds and Natural Pigments 5.1 Nomenclature, synthesis and reactions of imidazole,	Lecture & Discussion	Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India: Narosa, 2005	Worksheet
Jan 22-29, 2024 (Day Order 1 to 6) 3 hours	2.1 9-BBN, Osmium tetroxide, Lead Tetraacetate, 2,3- Dichloro-5,6-dicyano-1,4- benzoquinone (DDQ),	Lecture & Discussion	Sanyal,S.N. Reactions, Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York :Springer, 2007.	Quiz
*3 hours	5.1 Nomenclature, synthesis and reactions of imidazole, oxazole, thiazole and syndones.	Lecture & Discussion	Bhat, V. Sujata ,Bhimsa A. Nagasampagi, Meenakshi Siva Kumar. Chemi stry of Natural Products ,India: Narosa, 2005	Test
Jan 30 – Feb 2, 2024 (Day Order 1 to 4)	Iodoxy Benzoic acid (IDX), Perbenzoic Acid,	Lecture & Discussion	Sanyal,S.N. Reactions, Rearrangements and Reagents.New Delhi:BharathiBhawan,2006.	Quiz

	5.2 Natural Pigments – Classification based on	Lecture &	Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York: Springer, 2007.  Bhat,V. Sujata, Bhimsa A. Nagasampagi, Meenakshi Siya Kumar Chemi	Other Component
	source and structure.	Discussion	MeenakshiSivaKumar.Chemi stry of Natural Products ,India: Narosa, 2005	Test (15 marks)

Feb 3, 2024	<b>2.1</b> N-bromosuccinamide	Lecture	Sanyal,S.N. Reactions,	Test
(Day Order 2) and Feb 5- 6, 2024 (Day Order 5 to 6) 2 hours	(NBS), Phenylisothiocyanate	& Discussion	Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006. Carey ,A.Francis and Richard J.Sundburg. Advanced Organic Chemistry Part B: Reactions and Synthesis. New York:Springer, 2007.	
*1 hours  5.3 Anthocyanins— Introduction, Isolation,		Lecture & Discussion	Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India: Narosa, 2005	Test
Feb 7 – 14, 2024 (Day Order 1 to 6)	2.1 N,N'- Dicyclohexylcarbodiimide (DCC) 2.2 Baker's Yeast	Lecture & Discussion	Sanyal,S.N. Reactions, Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006	Worksheet
3 hours *3 hours	Determination of Structure of Anthocyanins 5.3 General methods for the synthesis of Anthocyanidins. Structural elucidation of Cyanin (Anthocyanin).	Lecture & Discussion	Bhat, V. Sujata ,Bhimsa A. Nagasampagi, Meenakshi Siva Kumar. Chemi stry of Natural Products ,India: Narosa, 2005	Quiz
Feb 15 – 22, 2024 (Day Order 1 to 6)	Unit 3 Organometallic Reagents in Organic Synthesis 3.1 Lithium 5.4 Flavones and Flavonols: Introduction, Classification, Isolation, General	Lecture & Discussion	Bhat, V. Sujata , Bhimsa A. Nagasampagi, Meenakshi Siva Kumar. Chemi stry of Natural Products , India: Narosa, 2005	Quiz
	Properties, Basic Structure of Flavones and Flavonols,	Lecture & Discus sion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Test

Feb 23 – 24, 2024 (Day Order 1 & 5)	3.1 Lithium: n-Butyl Lithium, Lithium diisopropylamide (LDA),	Lecture & Discussion	Bhat, V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India: Narosa, 2005	Quiz
	5.4 General Methods for Determination of the Structure of Flavones.	Lecture & Discus sion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Test
Feb 26 – Mar 1, 2024 (Day Order 2 to 6)	<b>3.1</b> Aluminium: Hydroalumnation, carboalumnation	Lecture & Discussion	Bhat, V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India: Narosa, 2005	Quiz
And Mar 2, 2024 (Day Order 1)	5.5 Structural Elucidation of Apigenin (Flavones),	Lecture & Discus sion	Finar, I.L. Organic Chemistry-Volume II, London: ELBS, 2000. Bhat,V. Sujata ,Bhimsa A. Nagasampagi, MeenakshiSivaKumar.Chemi stry of Natural Products ,India:	Test

Mar 4 –8,				
2024	C.A. Tes	t – II		
Mar 9 – 16,	Zing: Cyclopropagation	Lectu re&	Sanyal,S.N. Reactions,	Test
2024 (Day 6 &	Zinc: Cyclopropanation, Lomordo reagent,	Discussion	Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006.	
Day Order 1 to 6)			Carey ,A.Francis and Richard J.Sundburg. Advanced Organic	
*3 hours	5.5.0		Chemistry Part B: Reactions and Synthesis. NewYork	
	5.5 Structural Elucidation of Apigenin (Flavones), Quercetin (Flavonols) and Daidzein (Isoflavones)		:Springer, 2007.	
*3 hours		Lectu re& Discussion	Sanyal,S.N. Reactions, Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006.	Quiz
Mar 18 - 19,	3.1 Copper: Gilman reagent, Ullman	Lectu re		Work sheet
2024	reaction, Silicon: Alkyl	and		.,, 5555 8555 65
(Day Order 2	and Vinyl silanes 3.2 Crown Ether	Discu ssion		
to 3)	Complexes	SSIOII	Sanyal,S.N. Reactions,	
3 hours			Rearrangements and Reagents.New Delhi:BharathiBhawan ,2006.	
*3 hours	3.1 Tin: tri-n-Butyl Tin Hydride, Palladium: Suzuki coupling, Heck reaction, Sonagashira coupling	Lectu re and Discu ssion		Assignment
1 hour	Revision and Discussion	Discu ssion		Worksheet
*2 hours	ACVISION AND DISCUSSION			

Mar 20-22, 2024	REVISION				
(Day Order 4 to 6)					

## STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule:- November 2023- April 2024

**Department** : Chemistry

Name/s of the Faculty : New Faculty

Course Title : CORROSION AND ITS PREVENTION

Course Code : 19CH/PE/CP15

Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23, 2023 (Day Order 1 & 2) Nov 24-30, 2023 (Day Order 1 to 6)	Unit 1 Principles of Electrochemistry 1.1 Electrochemistry – Basic principles – Electrode potential,  Unit 1.1 Helmholtz electrical double layer, Electrochemical cell – Half reactions, Galvanic cell, calculation of the EMF of a cell 1.2 Electrochemical cell representation- EMF Series and its significance. Relation between EMF and Free energy – Determination of EMF of a half cell - Nernst equation and its derivation. 1.3 Calculation of half-cell and cell potential – calculation of equilibrium constant for the cell reaction	Lecture and Group Discussion  Lecture and Group Discussion	J. O. M.Bockris and A.K. N Reddy, Modern Electrochemistry. Vol. I and II, New York: Plenum Press, 1970. Jain P.C. and Monika Jain, Engineering Chemistry, New Delhi, Dhanpat Rai Publishing Company Pvt. Ltd. 2011. J. O. M.Bockris and A.K. N Reddy, Modern Electrochemistry. Vol. I and II, New York: Plenum Press, 1970. Jain P.C. and Monika Jain, Engineering Chemistry, New Delhi, Dhanpat Rai Publishing Company Pvt. Ltd. 2011.	Work sheet  Quiz
Dec 1-7, 2023 (Day Order 1 to 6)	1.4 Reference electrodes – Saturated calomel electrode, Glass electrode, standard hydrogen electrode. 1.5 Overvoltage or overpotential – Concentration cell and EMF of concentration cell	Lecture and Group Discussion	J. O. M.Bockris and A.K. N Reddy, Modern Electrochemistry. Vol. I and II, New York: Plenum Press, 1970. Jain P.C. and Monika Jain, Engineering Chemistry, New Delhi,	Test

			Dhanpat Rai Publishing	5
			Company Pvt. Ltd. 201	1.
Dec 8-9, 2023	Unit 2	Lecture and	M. G. Fontana,	Assignment
(Day Order 1,	Principles and Types of Corrosion	Discussion	Corrosion Engineering, New York, McGraw-Hi	
3)	2.1 Introduction – Corrosion		Book Company, 1987.	
	Rate Expression		Denny A Jones,	
			Principles and Prevention	on
			of Corrosion, New	
			Jersey, Prentice Hall, 1996.	
Dec 11-15,	2.1 Types of Corrosion –	Lecture and	M. G. Fontana,	Worksheet
	Chemical Corrosion,		Corrosion Engineering,	
2023	Electrochemical Corrosion	Discussion	New York, McGraw-Hi	
(Day Order 2 to	2.2 Types of Electrochemical		Book Company, 1987.	
6)	Corrosion – Galvanic		Denny A Jones,	
	Corrosion, Concentration Cell Corrosion,		Principles and Prevention	on
	Corrosion,		of Corrosion, New	
			Jersey, Prentice Hall,	
			1996.	
Dec 16 – 22,	2.2 Pitting Corrosion, Stress	Lecture and	M. G. Fontana,	Worksheet
2023	Corrosion, Inter-granular	Discussion	Corrosion Engineering,	
(Day Order 1 to	Corrosion. 2.3 Passivity,		New York, McGraw-Hi	111
6)	Factors influencing corrosion, EMF and Galvanic series.		Book Company, 1987.	
0)	2.4 Microbially influenced		Denny A Jones,	
	corrosion (MIC) –		Principles and Prevention	on
	Electrochemical aspects and		of Corrosion, New	
	general mechanisms.		Jersey, Prentice Hall,	
			1996.	
Jan 3 – 6, 2024	Unit 3	Powerpoint and	M. G. Fontana,	Test
(Day Order 1 to	Electrode Kinetics and	discussion	Corrosion Engineering,	
4)	Polarisation Phenomena		New York, McGraw-Hi	
,	3.1 Electrode – Solution Interface – definition and		Book Company, 1987. Denny A Jones,	
	types of Polarisation.		Principles and Prevention	on
	Jpos of Foldibution.		of Corrosion, New	
			Jersey, Prentice Hall,	
			1996.	
Jan 8 – 12, 2024		C.A. Test	- I	
Jan 13, 2024	3.1 Exchange current density	Lecture and	J. O. M.Bockris	Quiz
(Day Order 1)	– Polarisation relationships	Discussion	and A.K. N	
,			Reddy, Modern	
			Electrochemistry.	

			Vol. I and II, New York: Plenum Press, 1970. Jain P.C. and	
			Monika Jain,	
			Engineering	
			Chemistry, New	
			Delhi, Dhanpat	
			Rai Publishing	
			Company Pvt.	
			Ltd. 2011.	
Jan 18 -20, 2024 (Day Order 4 to 6)	3.1 Exchange current density  – Polarisation relationships	Lecture and Discussion	J. O. M.Bockris and A.K. N Reddy, Modern Electrochemistry. Vol. I and II, New York: Plenum Press, 1970. Jain P.C. and Monika Jain, Engineering Chemistry, New Delhi, Dhanpat Rai Publishing Company Pvt. Ltd. 2011.	III Component Test
Jan 22-29, 2024 (Day Order 1 to 6)	3.2 Polarisation Techniques – Corrosion Rate Determination. Mixed potentials – concepts and basics. 3.3 Mixed Potential Theory – bimetallic couples, activation and diffusion controlled processes	Powerpoint and discussion	M. G. Fontana, Corrosion Engineering, New York, McGraw- Hill Book Company, 1987. Denny A Jones, Principles and Prevention of Corrosion, New Jersey, Prentice Hall, 1996.	Test
Jan 30 – Feb 2, 2024	Unit 4 Methods of Corrosion Control 4.1 Protection against	Powerpoint and discussion	M. G. Fontana, Corrosion Engineering, New	Worksheet

			1	1
(Day Order 1 to	corrosion – Material selection		York, McGraw-	
4)	and Proper Designing		Hill Book	
	Principles, inhibitors and		Company, 1987.	
	surface engineering		Denny A Jones,	
	4.2 Cathodic Protection – Principles and Classification –		Principles and	
	Sacrificial Anodic Protection		Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Feb 3, 2024	4.2 Impressed Current	Powerpoint and	M. G. Fontana,	Test
(Day Order 2)	Cathodic Protection.	discussion	Corrosion	
			Engineering, New	
			York, McGraw-	
			Hill Book	
			Company, 1987.	
			Denny A Jones,	
			Principles and Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Feb 5- 6, 2024	4.2 Stray Current Corrosion.	Powerpoint and	M. G. Fontana,	Test
(Day Order 5 to	Anodic Protection	discussion	Corrosion	
			Engineering, New	
6)			York, McGraw-	
			Hill Book	
			Company, 1987.	
			Denny A Jones,	
			Principles and	
			Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Feb 7 – 14,	4.3 Passivity – Definition and	Lecture and	J. O. M.Bockris	Quiz
2024	parameters influencing	Group Discussion	and A.K. N	
(Day Order 1 to	passivity, design of Corrosion	-	Reddy, Modern	
	Resistant Alloys		Electrochemistry.	
6)			Vol. I and II, New	
			York: Plenum	
			Press, 1970.	
			Jain P.C. and	
			Monika Jain, Engineering	
			Chemistry, New	
			Delhi, Dhanpat	
			Rai Publishing	
			Company Pvt.	
			Ltd. 2011.	

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Feb 15 – 22,	4.4 Coatings – Metallic	Powerpoint and	M. G. Fontana,	Test
2024	Coatings – Organic and	discussion	Corrosion Engineering New	
(Day Order 1 to	Polymer Coatings –		Engineering, New	
6)	Phosphating Unit 5		York, McGraw- Hill Book	
0)				
	Corrosion Testing		Company, 1987.	
			Denny A Jones,	
			Principles and Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Feb 23 – 24,	5.1 NACE test methods –	Powerpoint and	M. G. Fontana,	Test
·	Open-circuit Potential – Time	1	Corrosion	1681
2024	measurements – Cyclic	discussion	Engineering, New	
(Day Order 1 &	polarization – Tafel plot for		York, McGraw-	
5)	aluminium alloys		Hill Book	
3)	arummum anoys		Company, 1987.	
			Denny A Jones,	
			Principles and	
			Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Feb 26 – Mar 1,	5.2 Linear polarisation –	Lecture and	M. G. Fontana,	Assignment
	Potentiostatic steady state		Corrosion	1 issignment
2024	experiments – Small	Discussion	Engineering, New	
(Day Order 2 to	Amplitude Cyclic		York, McGraw-	
6)	Voltammetry (SACV)		Hill Book	
			Company, 1987.	
			Denny A Jones,	
			Principles and	
			Prevention of	
			Corrosion, New	
			Jersey, Prentice	
			Hall, 1996.	
Mar 2, 2024	5.2 Small Amplitude Cyclic	Lecture and	M. G. Fontana,	Worksheet
(Day Order 1)	Voltammetry (SACV)	Discussion	Corrosion	
(Duy Older 1)		21000001011	l	
			Engineering, New	
			York, McGraw-	
			York, McGraw-	
			York, McGraw- Hill Book	
			York, McGraw- Hill Book Company, 1987.	
			York, McGraw- Hill Book Company, 1987. Denny A Jones,	
			York, McGraw- Hill Book Company, 1987. Denny A Jones, Principles and	
			York, McGraw- Hill Book Company, 1987. Denny A Jones, Principles and Prevention of	

Mar 4 –8, 2024	-8, 2024 C.A. Test – II			
Mar 9 – 16, 2024 (Day 6 & Day Order 1 to 6) (Day Order 1 to 6)	5.3 Small Amplitude Cyclic Voltammetry (SACV) AC impedance methods – Slow strain rate test.	Powerpoint and discussion	M. G. Fontana, Corrosion Engineering, New York, McGraw- Hill Book Company, 1987. Denny A Jones, Principles and Prevention of Corrosion, New Jersey, Prentice Hall, 1996.	Quiz
Mar 18 - 19, 2024 (Day Order 2 to 3)	Discussion of Questions	Powerpoint and discussion	M. G. Fontana, Corrosion Engineering, New York, McGraw- Hill Book Company, 1987. Denny A Jones, Principles and Prevention of Corrosion, New Jersey, Prentice Hall, 1996.	Quiz
Mar 20-22, 2024 (Day Order 4 to 6)		REVISIO	)N	ı

## STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: November 2023 - April 2024

**Department** : Chemistry

Name/s of the Faculty : Dr. R. Sripriya

Course Title : NANOCHEMISTRY

Course Code : 19CH/PE/NC15

Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23,	Unit 1	PowerPoint	Rao,C.N.R Muller,	Group
2023	Introduction to	presentation,	Achim, Cheetham,K	Discussion
(Day Order 1 &	Nanoscience	Lecture and	Anthony, The Chemistry	
2)	1.1 Concepts of	discussion	of	
	Nanoscience and		NanomaterialsSynthesis,P	
	Nanotechnology,		roperties and	
	Nanosized effects,		Applications. New York:	
	Surface to		WileyVCH, 2004.	
	Volume ratio, Quantum		Pradeep T, Nano: The	
	structures, Quantum		essentials - understanding	
	confinement effects		Nanoscience and	
	1.2 Classification of		Nanotechnology. New	
	Nanosystems based on		Delhi: McGraw Hill	
	origin (natural and		Education, 2007	
	artificial),			
	dimensionality and			
	structural configuration			
	(Carbon based, Metal			
	based,			
	Dendrimers, Composites)			
Nov 24-30,	1.3 Special	PowerPoint	Rao,C.N.R Muller,	Assignment
2023	nanomaterials: Carbon	presentation,	Achim, Cheetham,K	
(Day Order 1 to	Nanotubes, Fullerenes,	Lecture and	Anthony, The Chemistry	
6)	Graphene and Self	discussion	of	
	Assembled monolayers		NanomaterialsSynthesis,P	
	(SAMs), Nanoclusters		roperties and	
			Applications. New York:	
			WileyVCH, 2004.	
			Pradeep T, Nano: The	
			essentials - understanding	
			Nanoscience and	
			Nanotechnology. New	
			Delhi: McGraw Hill	
			Education, 2007	

Dec 1 7 2022	1.2 Cmanial	DayyanDaint	Doo C N D Myllon	A a a i a m m a m t
Dec 1-7, 2023 (Day Order 1 to	1.3 Special nanomaterials: Carbon	PowerPoint	Rao,C.N.R Muller, Achim, Cheetham,K	Assignment
(Day Order 1 to 6)	Nanotubes, Fullerenes,	presentation, Lecture and	Anthony, The Chemistry	
0)		discussion	of	
	Graphene and Self	discussion		
	Assembled monolayers		NanomaterialsSynthesis,P	
	(SAMs), Nanoclusters		roperties and	
			Applications. New York:	
			WileyVCH, 2004.	
			Pradeep T, Nano: The	
			essentials - understanding	
			Nanoscience and	
			Nanotechnology. New	
			Delhi: McGraw Hill	
			Education, 2007	
Dec 8-9, 2023	1.4 Applications of	PowerPoint	Pradeep T, Nano: The	Short test
(Day Order 1,	Nanomaterials in	presentation,	essentials - understanding	
3)	electronics,	Lecture and	Nanoscience and	
,	Nanomechanics and	discussion	Nanotechnology. New	
	nanobots,		Delhi: McGraw Hill	
	catalysis (gold		Education, 2007. Kenneth	
	nanoparticles), Quantum		J.Klabunde. Nanoscale	
	dot devices, Medicine		materials in Chemistry.	
	and Drug delivery		New York: John Wiley	
			&	
			Sons, 2001	
D 11.15	4.537			
Dec 11-15,	1.5 Nanowires and	PowerPoint	Guozhong C.	Assignment
2023	Nanomachines	presentation,	Nanostructures & Damp;	
(Day Order 2 to		Lecture and	Nanomaterials: Synthesis,	
6)		discussion	Properties & amp;	
			Applications, London:	
			Imperial College	
			Press,2004	
Dec 16 – 22,	Unit 2	PowerPoint	Guozhong C.	Assignment
2023	Fabrication of	presentation,	Nanostructures & amp;	
(Day Order 1 to	Nanomaterials	Lecture and	Nanomaterials: Synthesis,	
6)	2.1 Techniques for	discussion	Properties & Damp;	
	Synthesis of Nanophase		Applications, London:	
	Materials – Top-down vs		Imperial College	
	Bottom-up		Press,2004	
	Approach		,	
Jan 3 – 6, 2024	2.2 Physical Methods of	PowerPoint	Guozhong C.	Group
(Day Order 1 to	Synthesis-High energy	presentation,	Nanostructures &	discussion
4)	Ball milling, Arc	Lecture and	Nanomaterials: Synthesis,	
	discharge, Plasma	discussion	Properties & Applications,	
	synthesis, Aerosol		London: Imperial College	

synthesis, Physical and	Press,2004
Chemical Vapour	Ramachandra R., Singh S,
deposition,	Nanoscience and
Electrodeposition	Nanotechnology-
	Fundamentals and
	Frontiers.
	New Delhi , Wiley,2013

Jan 8 – 12, 2024		C.A. Test – I				
Jan 13, 2024 (Day Order 1)	2.3 Chemical Methods of Synthesis–Chemical reduction, Solvothermal,	PowerPoint presentation, Lecture and discussion	Guozhong C. Nanostructures & Nanomaterials: Synthesis, Properties & Applications, London: Imperial College Press,2004 Ramachandra R., Singh S, Nanoscience and Nanotechnology- Fundamentals and Frontiers. New Delhi , Wiley,2013	Assignment		
Jan 18 -20, 2024 (Day Order 4 to 6)	Hydrothermal, Microemulsion, Sol gel method 2.4 Synthesis and applications of Pure Metal nanoparticles (Gold and Silver) and metal oxide nanoparticles (ZnO, TiO <sub>2</sub> )	PowerPoint presentation, Lecture and discussion	Guozhong C.  Nanostructures & Nanomaterials: Synthesis, Properties & Applications, London: Imperial College Press,2004 Ramachandra R., Singh S, Nanoscience and Nanotechnology- Fundamentals and Frontiers. New Delhi , Wiley,2013	Assignment		
Jan 22-29, 2024 (Day Order 1 to 6)	2.5 Nanomaterial fabrication techniques- Lithography, Electrospinning	PowerPoint presentation, Lecture and discussion	Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry. New York: John Wiley & Sons, 2001	Short test		
Jan 30 – Feb 2, 2024 (Day Order 1 to 4)	Unit 3 Nanocomposites 3.1 Definition of composite materials: Classification based on matrix and reinforcements, Properties and	PowerPoint presentation, Lecture and discussion	Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry.	Group Discussion		

Feb 3, 2024	Processing of	PowerPoint	New York: John Wiley & Samp; Sons, 2001	Group
(Day Order 2)	nanocomposites	presentation, Lecture and discussion	essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry. New York: John Wiley & Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry. New York: John Wiley Sons, 2001	Discussion
Feb 5- 6, 2024 (Day Order 5 to 6)	3.2 Types of nanocomposites: polymer-clay nanocomposites,	PowerPoint presentation, Lecture and discussion	Rao,C.N.R Muller, Achim, Cheetham,K Anthony, The Chemistry of NanomaterialsSynthesis,P roperties and Applications. New York: WileyVCH, 2004. Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007	Assignment
Feb 7 – 14, 2024 (Day Order 1 to 6)	Conducting nanocomposites, types of nanofiller- metal oxides, layered silicates, nanowires, nanotubes and quantum dots.	PowerPoint presentation, Lecture and discussion	Rao,C.N.R Muller, Achim, Cheetham,K Anthony, The Chemistry of NanomaterialsSynthesis,P roperties and Applications. New York: WileyVCH, 2004. Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007	Assignment

Feb 15 – 22, 2024 (Day Order 1 to 6)	3.3 Characterisation of nanocomposites: thermal, mechanical, surface, physical properties-density, viscosity, spectral analysis  3.4 Application of nanocomposites	PowerPoint presentation, Lecture and discussion	Rao,C.N.R Muller, Achim, Cheetham,K Anthony, The Chemistry of NanomaterialsSynthesis,P roperties and Applications. New York: WileyVCH, 2004. Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007	Short test
Feb 23 – 24,	Unit 4	PowerPoint	Rao,C.N.R Muller,	Group
2024	Properties and	presentation,	Achim, Cheetham,K	Discussion
(Day Order 1 &	Characterisation	Lecture and	Anthony, The Chemistry	Discussion
5)	Techniques of Nanophase	discussion	of	
	Materials		NanomaterialsSynthesis,P	
	4.1 Size Dependent		roperties and	
	properties of		Applications. New York:	
	Nanomaterials: Optical		WileyVCH, 2004.	
	properties (Surface		Pradeep T, Nano: The	
	Plasmon		essentials - understanding	
	resonance), mechanical,		Nanoscience and	
	electrical, magnetic and		Nanotechnology. New	
	thermal properties. Kinetic		Delhi: McGraw Hill	
	and Thermodynamic Features		Education, 2007	
	Thermodynamic Features of Nano materials			
	4.2 Characterisation			
	techniques* (with			
	reference to			
	nanomaterials): UV-			
	Visible			
	Spectroscopy-Band Gap			
	calculation, X ray			
	diffraction.			
	, Wide angle extended			
	Xray			
Ech 26 Mar 1	absorption technique	DovvomDoin4	Doo C N D Muller	Toot
Feb 26 – Mar 1, 2024	Electron Microscopy – SEM/TEM, DLS, Defects	PowerPoint	Rao,C.N.R Muller, Achim, Cheetham,K	Test
(Day Order 2 to	in Nanomaterials, Co-	presentation, Lecture and	Achim, Cheetham, K Anthony, The Chemistry	
(Day Order 2 to 6)	relation of XRD and TEM	discussion	of	
	Totalion of The und Thirl	GIBCUBBIOII	NanomaterialsSynthesis,P	
			roperties and	

			Applications. New York: WileyVCH, 2004. Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007	
Mar 2, 2024 (Day Order 1)	Unit 5 Impacts of Nanomaterials 5.1 Nanomaterials and the Environment – Exposure, Fate, Transport and Transformation	PowerPoint presentation, Lecture and discussion	Rao,C.N.R Muller, Achim, Cheetham,K Anthony, The Chemistry of NanomaterialsSynthesis,P roperties and Applications. New York: WileyVCH, 2004. Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007	Test
Mar 4 –8, 2024		C.A. Test	: <b>– II</b>	
Mar 9 – 16, 2024 (Day 6 & Day Order 1 to 6)	5.2 Nanomaterials and Biological systems – Toxicity, Exposure and Absorption, Metabolism	PowerPoint presentation, Lecture and discussion	Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry. New York: John Wiley & Sons, 2001	Group discussion
Mar 18 - 19, 2024 (Day Order 2 to 3)	Absorption, Metabolism	PowerPoint presentation, Lecture and discussion	Pradeep T, Nano: The essentials - understanding Nanoscience and Nanotechnology. New Delhi: McGraw Hill Education, 2007. Kenneth J.Klabunde. Nanoscale materials in Chemistry. New York: John Wiley & Education, 2007.	Group discussion

		Sons, 2001	
Mar 20-22, 2024 (Day Order 4 to 6)	REVISIO	ON	