LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Sharmila Bhattacharya

Course Name: Four-Year B.A./B.ScChemistry (Honours and Honours with Research) Course

Semester: 1+Semester:2

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC1-1-Th/Module : I	Extra nuclear structure of atoms	1.Lee,J.D.Concise Inorganic Chemistry 2.Sarkar,R.P.General & Inorganic Chemistry	7	Class room teaching(traditional method)	
CHEM-H-SEC1-1-Th/Module : II	Titrimeric analysis & Tutorial	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	8+4	Class room teaching(traditional method)	
CHEM-H-CC1-1-P	Acid-Base Titration, Redox Titration	Practical Workbook Chemistry(H),UGBOS,University of Calcutta	30	Class room teaching(traditional method)	
CHEM-H-IDC1-1-Th/Module : II	Titrimetric analysis &Tutorial	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	8+4	Class room teaching(traditional method)	
CHEM-H-CC2-2-Th/ Module : II	Chemical bonding	1.Lee,J.D.Concise Inorganic Chemistry 2.Sarkar,R.P.General & Inorganic Chemistry	7	Class room teaching(traditional method)	
CHEM-H-IDC2-2-Th/Module: II	Titrimetric analysis &Tutorial	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	8+4	Class room teaching(traditional method)	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Sharmila Bhattacharya

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
Course Name: Three-Year B.A./B.ScChemistry (Honours) under CBCS: **Semester: 3**					
CC-3-6-TH/ INORGANIC CHEMISTRY-3	Noble gases,Inorganic polymers,Coordination Chemistry-I	1.Lee,J.D.Concise Inorganic Chemistry 2.Sarkar,R.P.General & Inorganic Chemistry 3.Huheey,J.E.;Keiter,E.A,& Keiter, R.L. InorganicChemistry,Principles of Structure and Reactivity	30	Class room teaching(traditional method)	
SEC-2:Analytical Clinical Biochemistry	Lipids,Lipoproteins	1.Lectures on Analytical Clinical biochemistry,C Saha,B.Chakraborty,S.Chakraborty.K.Basu	10	Class room teaching(traditional method)	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Sharmila Bhattacharya

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**

Three-Year B.A./B.ScChemistry (Honours) under CBCS

Semester: 5

DSE-B-1-Th:Inorganic materialsof industrial importance	Silicate industries,Fertilizers,Batteries	1.J.A.Kent:Riegel's Handbook of Industrial Chemistry	30	Class room teaching(traditional method)	
DSE-B-1-P			45	Class room teaching(traditional method)	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Sharmila Bhattacharya

Course Name: Three-Year B.A./B.ScChemistry(Multidisciplinary) Course Semester:1					
CHEM-MD-CC1-1-Th Module:I	Extra nuclear structures of atoms &periodicity	1.Lee,J.D.Concise Inorganic Chemistry 2.Sarkar,R.P.General & Inorganic Chemistry	15	Class room teaching(traditional method)	
CHEM-MD-SEC-Th+Tutorial	Chemistry in daily life:Module:I	1.B.K.Sharma:Introduction to Industrial Chemistry 2.Ashutosh Kar.Medicinal Chemistry	15+5	Class room teaching(traditional method)	
Course Name: Three-Year B.A./B.ScChemistry(general) Course under CBCS **Semester: 3**					
CC3/GE3-Th	Transition Elements(3d	1.R.L Dutta	15	Class room teaching(traditional	

CC3/GE3-P	series)&Coordination Chemistry Qualitative analysis			method)	
Semester:5					
DSE-A2: Inorganic materials of industrial importance	Silicate industries,Fertilizers,Batteries.	1.J.A.Kent:Riegel's Handbook of Industrial Chemistry	30	Class room teaching(traditional method)	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Course Name: Four-Year B.A./B.Sc Chemistry (Major and Minor) Course

Semester: 1

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-SEC1-1-Th/Module : II	**Introduction to Quantitative analysis and its interdisciplinary nature**: **Complexometric titrimetry:**	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	3	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-SEC1-1-Th/Module: III	**Water analysis: Water treatment technologies**:	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	8	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-SEC1-1-Tu	1. Safety Practices in the Chemistry Laboratory, knowledge about common toxic chemicals and safety measures in their handling, cleaning and drying of glass wares. 2. Calibration of glassware, pipette, burette and volumetric flask. 3. Preparation of TLC plates and separation of amino acids		5	On class demonstrations, study material supplied, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	4. Calibration of instruments like colorimeter, pH-meter, conductivity meter, spectrophotometer using reference standards or reference materials. 5. Conductometric titration between HCl and NaOH. 6. Determination of alkali present in soaps/detergents.				
CHEM-H-CC1-1-Th/Module: III	**Thermodynamics -I: Chemical Kinetics-I:**	**1. Levine, I. N. Physical Chemistry, 6th Edition McGraw-Hill India, 2011** **2. Castellan, G. W. Physical Chemistry, Narosa , 2004** **3. Atkins, P. W. & Paula, J. de, Atkins' Physical Chemistry, 11th Edition, Oxford University Press, 2018** **4. G. L. Miessler, D. A. Tarr, Inorganic Chemistry , 3rd Edition, Pearson India, 2008**	15	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-CC1-1-P	(1) Calibration and use of apparatus. (2) Preparation of primary standard solutions (Oxalic Acid and K2Cr2O7) **Acid-Base Titrations:**	**1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.** **2. Practical Workbook Chemistry (Honours), UGBOS, Chemistry, University of Calcutta, 2015**	30	On class demonstrations, study material supplied, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	(3) Standardization of NaOH standard oxalic acid solution. (4) Estimation of Carbonate and bicarbonate present together in a mixture (5) Estimation of acetic acid in commercial Vinegar. **Oxidation-Reduction Titrimetry:** (6) Standardization of KMnO4 standard Oxalic Acid solution. (7) Estimation of Fe(II) using standardized KMnO4 solution. (8) Estimation of Fe(III) using standard K2Cr2O7 solution. (9) Estimation of Fe(II) and Fe(III) in a given mixture using standard K2Cr2O7 solution.				
CHEM-H-IDC1-1-Th/Module: II	**Complexometric titrimetry:**		3	On class demonstrations, study material supplied, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-IDC1-1-Th/Module: III	**Water analysis: Water treatment technologies**:	**1. Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022 2. Daniel C. Harris , Quantitative Chemical Analysis , 10th Edition , W.H. Freeman , 2020**	8	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-IDC1-1-Tu	1. Safety Practices in the Chemistry Laboratory, knowledge about common toxic chemicals and safety measures in their handling, cleaning and drying of glass wares. 2. Calibration of glassware, pipette, burette and volumetric flask. 3. Preparation of TLC plates and separation of amino acids 4. Calibration of instruments like colorimeter, pH-meter, conductivity meter, spectrophotometer using reference standards or reference materials.	**Practical Workbook Chemistry (Honours), UGBOS, Chemistry, University of Calcutta, 2015**	5	On class demonstrations, study material supplied, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	5. Determination of alkali present in soaps/detergents.				
			77		

Semester: 2

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC2-2-Th/Module:I	**Kinetic Theory and Gaseous state: Real gas and Virial equation:**	**6. Levine, I. N. Physical Chemistry, 6th Edition McGraw-Hill India, 2011** **7. Castellan, G. W. Physical Chemistry, Narosa , 2004** **8. Atkins, P. W. & Paula, J. de, Atkins' Physical Chemistry,**	15	On class demonstrations, study material supplied, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		11th Edition, Oxford University Press, 2018 **9. G. L. Miessler, D. A. Tarr, Inorganic Chemistry , 3rd Edition, Pearson India, 2008**			
CHEM-H-CC2-3-Th/Module:I	**Kinetic Theory and Gaseous state: Real gas and Virial equation:**	**6. Levine, I. N. Physical Chemistry, 6th Edition McGraw-Hill India, 2011** **7. Castellan, G. W. Physical Chemistry, Narosa , 2004** **8. Atkins, P. W. & Paula, J. de, Atkins' Physical Chemistry, 11th Edition, Oxford University Press, 2018** **9. G. L. Miessler, D. A. Tarr, Inorganic Chemistry , 3rd Edition, Pearson India, 2008**	15	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-CC2-3-P	(1) Standardization of Na2S2O3 solution against standard K2Cr2O7 solution.	**1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis**	30	On class demonstrations, study material supplied,	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	Iodo-/ Iodimetric Titrations (2) Estimation of Vitamin C (3) Estimation of (i) arsenite and (ii) antimony iodimetrically (4) Estimation of available chlorine in bleaching powder. **Estimation of metal content in some selective samples** (5) Estimation of Cu in brass. (6) Estimation of Cr and Mn in Steel. (7) Estimation of Fe in cement.	**6th Ed., Pearson, 2009.** **2. Practical Workbook Chemistry (Honours), UGBOS, Chemistry, University of Calcutta, 2015**		modelling and interactive discussions	
CHEM-H-IDC1-1-Th/Module: III	**Water analysis:** **Water treatment technologies**:	**1. Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022** **2. Daniel C. Harris , Quantitative Chemical Analysis , 10th Edition , W.H. Freeman , 2020**	8	On class demonstrations, study material supplied, modelling and interactive discussions	
CHEM-H-IDC1-1-Tu	1. Safety Practices in the Chemistry Laboratory, knowledge about common toxic chemicals and safety measures in	**Practical Workbook Chemistry (Honours), UGBOS, Chemistry,**	5	On class demonstrations, study material supplied,	

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	their handling, cleaning and drying of glass wares. 2. Calibration of glassware, pipette, burette and volumetric flask. 3. Preparation of TLC plates and separation of amino acids 4. Calibration of instruments like colorimeter, pH-meter, conductivity meter, spectrophotometer using reference standards or reference materials. 5. Determination of alkali present in soaps/detergents.	**University of Calcutta, 2015**		modelling and interactive discussions	
		Total	73		

Course Name: Three-Year B.A./B.Sc Chemistry (Honours and General) under CBCS

Semester: 3

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CC-3-5-TH/ PHYSICAL CHEMISTRY-3	Electrochemistry, Ionic equilibrium, Electromotive force	**1. Levine, I. N. *Physical Chemistry*, 6th Edition , McGraw-Hill India 2. Castellan, G. W. *Physical Chemistry*, Narosa 3. McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press 4. Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**	24	Face-to-face demonstrations, modelling and interactive discussions	
Sec 2/Analytical clinical biochemistry	Carbohydrates Enzymes	1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977). 2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009). 3. Varley, H., Gowenlock, A.H &	12	Face-to-face demonstrations, hand on experiment and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980).			
CC3/GE3/Practical	**Qualitative semimicro analysis of mixtures containing two radicals. Emphasis should be given to the understanding of the chemistry of different reactions.**		45		
		Total	81		

Semester: 4

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CC-4-9-TH/ PHYSICAL CHEMISTRY-4	Foundation of quantum mechanics Crystal structure	1. Atkins, P. W. *Molecular Quantum Mechanics*, 5th edition ,Oxford	40	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		2. Levine, I. N. *Quantum Chemistry*, 7th Edition, Pearson India 3. Sannigrahi A.B, Quantum Chemistry,2nd Edition, Books and Allied Pvt Ltd.			
		Total	40		

Semester: 5

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Content Delivery Planned**	**Technique**	**Remarks / Comments**
CC11/Physical Chemistry-5	Quantum chemistry II	**1. Levine, I. N. *Physical Chemistry*, 6th Edition McGraw-Hill India** **2. Castellan, G. W. *Physical Chemistry*, Narosa** **3. McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press** **4. Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**	**30**		
CC11 Practical Physical Chemistry	Programming 1 Programming 2 Programming 3	McQuarrie, D. A. *Mathematics for PhysicalChemistry*. University Science Books (2008)	**45**		
DSE-A-2 APPLICATIONS OF COMPUTERS IN CHEMISTRY	Computer Programming Basics (FORTRAN), Introduction to Spreadsheet Software (MS Excel), Statistical Analysis	McQuarrie, D. A. *Mathematics for PhysicalChemistry*. University Science Books (2008)	60		
DSE-A-2 Practical	Use of Excel, FORTRAN, Linear and Non Linear Least squares fit to analyze chemical systems.	1. Levie, R. de, How to use Excel in analytical chemistry and in general scientific data analysis, Cambridge Univ. Press (2001)	45		

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Content Delivery Planned**	**Technique**	**Remarks / Comments**
CC11/Physical Chemistry-5	Quantum chemistry II	**1. Levine, I. N. *Physical Chemistry*, 6th Edition McGraw-Hill India 2. Castellan, G. W. *Physical Chemistry*, Narosa 3. McQuarrie, D. A. & Simons, J. D. *Physical Chemistry: A Molecular Approach*, Viva Press 4. Kapoor K.L, A Text Book Of Physical Chemistry , McGraw Hill India**	**30**		
CC11 Practical Physical Chemistry	Programming 1 Programming 2 Programming 3	McQuarrie, D. A. *Mathematics for PhysicalChemistry*. University Science Books (2008)	**45**		
		Total	180		

Semester: 6

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CC14	Photochemistry and Theory of reaction rate,	1. Banwell, C. N. Fundamentals of	30	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
Physical Chemistry-5	Surface phenomenon	Molecular Spectroscopy, Tata-McGraw-Hill 2. Barrow, G. M. Molecular Spectroscopy, McGraw-Hill 3. Hollas, J.M. Modern Spectroscopy, Wiley India 4. McHale, J. L. Molecular Spectroscopy, Pearson Education 5. Wayne, C. E. & Wayne, R. P. Photochemistry, OUP 6. Brown, J. M. Molecular Spectroscopy, OUP			
CC14 Practical Physical Chemistry-5	Advanced physicochemical experiments	**Practical Workbook Chemistry (Honours), UGBOS, Chemistry, University of Calcutta, 2015**	45		
DSE(B)-6-4-TH/ DISSERTATION	Topics on physical chemistry		105	Guidance and support for research or review work	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Anuva Samanta

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Total	180		

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC1-1-Th	Basics of Organic Chemistry Bonding and Physical Properties, Stereochemistry – I	1. Finar, I. L. Organic Chemistry (Volume 1), 6th Edition , Pearson Education , 2002 2. Sykes, P. A guidebook to Mechanism in Organic Chemistry, Pearson Education, 2003. 3. Nasipuri, D. Stereochemistry of Organic Compounds, 4th Edition, New Age International Pvt Ltd , 2020	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CHEM-H-CC1-1-Th CHEM-MD-CC1-1-Th	Basics of Organic Chemistry Bonding and Physical Properties, Stereochemistry – I	1. Finar, I. L. Organic Chemistry (Volume 1), 6th Edition , Pearson Education , 2002 2. Sykes, P. A guidebook to Mechanism in Organic Chemistry, Pearson Education, 2003. 3. Nasipuri, D. Stereochemistry of Organic Compounds, 4th Edition, New Age International Pvt Ltd , 2020	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-MD-SEC-Th	Dairy Products, Food additives, adulterants, and contaminants, Artificial food colorants	1. Ashtoush Kar. Medicinal Chemistry (Two Colour Edition), New Age International Pvt Ltd, 2022 2. Edward Cox Henry , The Chemical analysis of Foods , Hardcover , Hassell Street Press , 2021	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CHEM-H-CC2-2-Th	Stereochemistry – II, General Treatment of Reaction Mechanism-I	1. Finar, I. L. Organic Chemistry (Volume 1), 6th Edition , Pearson Education , 2002 2. Sykes, P. A guidebook to Mechanism in Organic Chemistry, Pearson Education, 2003. 3. Nasipuri, D. Stereochemistry of Organic Compounds, 4th Edition, New Age International Pvt Ltd , 2020	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC2-2-Th CHEM-MD-CC2-2-Th	Stereochemistry – II, General Treatment of Reaction Mechanism-I.	1. Finar, I. L. Organic Chemistry (Volume 1), 6th Edition , Pearson Education , 2002 2. Sykes, P. A guidebook to Mechanism in Organic Chemistry, Pearson Education, 2003. 3. Nasipuri, D. Stereochemistry of Organic Compounds, 4th Edition, New Age International Pvt Ltd , 2020	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC-3-7-TH ORGANIC CHEMISTRY -3	Alkenes, Alkynes, Carbonyls	1. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education). 26 2. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education). 3. Sykes, P. *A guidebook to Mechanism in Organic*	60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Chemistry, Pearson Education, 2003. 4. Carey, F. A., Guiliano, R. M.*Organic Chemistry*, Eighth edition, McGraw Hill Education, 2012. 5. Loudon, G. M. *Organic Chemistry*, Fourth edition, Oxford University Press, 2008. 6. Norman, R.O. C., Coxon, J. M. *Principles of Organic Synthesis*, Third Edition, Nelson Thornes, 2003. 7. Clayden, J., Greeves, N. &Warren, S. *Organic Chemistry*, Second edition, Oxford UniversityPress, 2012. 8. Graham Solomons, T.W., Fryhle, C. B. *Organic Chemistry*, John Wiley & Sons, Inc.			

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		9. Smith, J. G. *Organic Chemistry*, Tata McGraw-Hill Publishing Company Limited. 10. March, J. *Advanced Organic Chemistry*, Fourth edition, Wiley.			
CEMA-CC-3-7-P PRACTICALS	Identification of a Pure Organic Compound and Quantitative Estimations	1. Bhattacharyya, R. C, *A Manual of Practical Chemistry*. 2. Vogel, A. I. *Elementary Practical Organic Chemistry*, Part 2: *Qualitative Organic Analysis*, CBS Publishers and Distributors. 3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009).	45	Offline method 1. Traditional method through the use of the chalk and board	
SEC-A-2	Biochemistry of disease: A diagnostic approach by	1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977).	10	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
ANALYTICAL CLINICAL BIOCHEMISTRY	blood/ urine analysis.	2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009). 3. Varley, H., Gowenlock, A.H & Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980). 4. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.		2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CC/GE 3	Aromatic Hydrocarbons, Organometallic Compounds, Aryl Halides	1. Sethi, A. *Conceptual Organic Chemistry;* New Age International Publisher. 2. Parmar, V. S. *A Text Book of Organic*	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Chemistry, S. Chand & Sons. 3. Madan, R. L. *Organic Chemistry*, S. Chand & Sons. 4. Wade, L. G., Singh, M. S., *Organic Chemistry*, *Pearson.*		3. Consulting different reference books and photocopy of prepared notes 4. E book	
CC3/GE 3 Practical	Qualitative semimicro analysis of mixtures containing two radicals. Emphasis should be given to the understanding of the chemistry of different reactions.	1. Ghosal, Mahapatra & Nad, *An Advanced Course in Practical Chemistry*, New Central	23	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
SEC-A-2 ANALYTICAL CLINICAL BIOCHEMISTRY	Biochemistry of disease: A diagnostic approach by blood/ urine analysis.	1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977). 2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009). 3. Varley, H., Gowenlock, A.H & Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980). 4. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.	10	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC-4-8-TH	Organic Synthesis, Spectroscopy	1. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India)	60	Offline method 1. Traditional method through the	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
ORGANIC CHEMISTRY -4		Pvt. Ltd. (Pearson Education). 2. Finar, I. L. *Organic Chemistry* (*Volume 2: Stereochemistry and the Chemistry* *of Natural Products*), Dorling Kindersley (India) Pvt. Ltd.(Pearson Education). 3. Norman, R.O. C., Coxon, J. M. *Principles of Organic Synthesis*, Third Edition, Nelson Thornes, 2003. 4. Clayden, J., Greeves, N., Warren, S., *Organic Chemistry*, Second edition,		use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Oxford University Press 2012. 5. Silverstein, R. M., Bassler, G. C., Morrill, T. C. *Spectrometric Identification of Organic Compounds*, John Wiley and Sons, INC, Fifth edition. 6. Kemp, W. *Organic Spectroscopy*, Palgrave. 7. March, J. *Advanced Organic Chemistry*, Fourth edition, Wiley. 8. Warren, S. *Organic Synthesis the Disconnection Approach*, John Wiley and Sons.			

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		9. Warren, S., *Designing Organic Synthesis*, Wiley India, 2009. 10. Carruthers, W. *Modern methods of Organic Synthesis*, Cambridge University Press.			
CEMA-CC-4-8-P PRACTICALS	Qualitative Analysis of Single Solid Organic Compounds	1. Clarke, H. T., *A Handbook of Organic Analysis (Qualitative and Quantitative)*, Fourth Edition, CBS Publishers and Distributors (2007). 2. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015.	45	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
SEC-B-3 PHARMACEUTICALS CHEMISTRY	Drugs & Pharmaceuticals	1. Patrick, G. L. Introduction to Medicinal Chemistry, Oxford University Press, UK, 2013. 2. Singh, H. & Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan, Pitampura, New Delhi, 2012.	10	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CC/GE 4	Alcohols, Phenols and Ethers, Carbonyl Compounds, Carboxylic Acids and Their Derivatives…		44	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
				4. E book	
SEC-B-3 PHARMACEUTICALS CHEMISTRY	Drugs & Pharmaceuticals	1. Patrick, G. L. Introduction to Medicinal Chemistry, Oxford University Press, UK, 2013. 2. Singh, H. & Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan, Pitampura, New Delhi, 2012.	10	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC-5-12-TH ORGANIC CHEMISTRY -5	Cyclic Compounds, Biomolecules	1. Clayden, J., Greeves, N., Warren, S. *Organic Chemistry*, Second edition, Oxford University Press 2012. 2. Eliel, E. L. & Wilen, S. H. *Stereochemistry of*	60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Organic Compounds, Wiley: London. 3. Nasipuri, D. *Stereochemistry of Organic Compounds*, Wiley Eastern Limited. 4. Fleming, I. *Molecular Orbitals and Organic Chemical reactions*, Reference/Student Edition, Wiley, 2009. 5. Fleming, I. *Pericyclic Reactions*, Oxford Chemistry Primer, Oxford University Press. 6. Gilchrist, T. L. & Storr, R. C. *Organic Reactions and Orbital symmetry*,		3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Cambridge University Press. 7. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd.(Pearson Education). 8. Finar, I. L. *Organic Chemistry* (*Volume 2: Stereochemistry and the Chemistry of Natural Products*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education). 9. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).			

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		10. Loudon, G. M. *Organic Chemistry*, Fourth edition, Oxford University Press.			
CEMA-CC-5-12-P PRACTICALS	Chromatographic Separations and Spectroscopic Analysis of Organic Compounds	1. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015 2. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. *Practical Organic Chemistry, 5th Ed.*, Pearson (2012). 3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education.	45	Offline method 1. Traditional method through the use of the chalk and board	
DSE-A-3-TH	Green Chemistry	1. Lancaster, M. *Green Chemistry: An*	60	Offline method	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
Green Chemistry		*Introductory Text* RSC Publishing, 2nd Edition, 2010. 2. Ahluwalia, V. K & Kidwai, M. R. New Trends in Green Chemistry, Anamalaya Publishers, 2005. 3. Finar, I. L. *Organic Chemistry* (*Volume 2*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).		1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
DSE-A-3-P PRACTICALS	PRACTICALS - GREEN CHEMISTRY	1. Anastas, P.T & Warner, J.C. *Green Chemistry: Theory and Practice*,OxfordUniversity Press (1998). 2. Kirchoff, M. & Ryan, M.A. *Greener approaches*	45	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		to undergraduate chemistryexperiment. American Chemical Society, WashingtonDC (2002). 3. Ryan, M.A. *Introduction to Green Chemistry*, Tinnesand; (Ed), American Chemical Society, WashingtonDC (2002).			
DSE-B-1-TH Green Chemistry	Green Chemistry	1. Lancaster, M. *Green Chemistry: An Introductory Text* RSC Publishing, 2nd Edition, 2010. 2. Ahluwalia, V. K & Kidwai, M. R. New Trends in Green Chemistry, Anamalaya Publishers, 2005.	60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		3. Finar, I. L. *Organic Chemistry* (*Volume 2*), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).			
DSE-B-1-P PRACTICALS	PRACTICALS - GREEN CHEMISTRY	1. Anastas, P.T & Warner, J.C. *Green Chemistry: Theory and Practice*,OxfordUniversity Press (1998). 2. Kirchoff, M. & Ryan, M.A. *Greener approaches to undergraduate chemistryexperiment*. American Chemical Society, WashingtonDC (2002). 3. Ryan, M.A. *Introduction to Green Chemistry*, Tinnesand; (Ed), American	45	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr Priyabrata Roy

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Chemical Society, WashingtonDC (2002).			
		Total			

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC-1-TH	Thermodynamics	1. Basic Physical Chemistry Castellan 2. Fundamental physical chemistry Levine 3. Physical chemistry by Atkins 4. Physical Chemistry by KL Kapoor	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
Chem-CC-3-Th	Thermodynamics II, Electrochemistry	1. Basic Physical Chemistry Castellan 2. Fundamental physical chemistry Levine 3. Physical chemistry by Atkins 2. 4. Physical Chemistry by KL Kapoor by Glasstone	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-MD-SEC-Th	Dairy Products, Food additives, adulterants, and contaminants, Artificial food colorants	1. Ashtoush Kar. Medicinal Chemistry (Two Colour Edition), New Age International Pvt Ltd, 2022 2. Edward Cox Henry , The Chemical analysis of Foods , Hardcover , Hassell Street Press , 2021	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CHEM-H-CC3-3-Th	Thermodynamics II,	Thermodynamics by H. Chatterjee	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC2-2-Th CHEM-SEC1 -Th	Water treatment technology and Basic Laboratory Practices	Quantitative analysis by Vogel Analytical Chemistry by Skoog	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC-3-8-TH Physical CHEMISTRY -3	Application of Thermodynamics	Thermodynamics By Atkins	60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CEMA-CC-3-8-P PRACTICALS	Conductometric titration, Saponification experiment	Calcutta University Practical Book	45	Offline method 1. Traditional method through the use of the chalk and board	
CC/GE 3	Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water; Ionization of weak acids and bases, pH	1. . Chugh, K.L., Agnish, S.L. A Text Book of Physical Chemistry Kalyani Publishers 5. N. G. Mukherjee Quantum Chemistry, molecular Spectroscopy and Photochemistry.Archana Publishing Center,(2010). 6. Bahl, B.S., Bahl, A., Tuli, G.D., Essentials of Physical Chemistry S. Chand & Co. ltd. 7. Palit, S. R., Elementary Physical	15	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	scale, common ion effect; Salt hydrolysis- calculation of hydrolysis constant, degree of hydrolysis and pH for different salts; Buffer solutions; Solubility and solubility product of sparingly soluble salts – applications of solubility product principle 2) Conductance Conductance, cell constant,	Chemistry Book Syndicate Pvt. Ltd. 8. N. G. Mukherjee, Elementary Physical Chemistry Archana Publishing Center,(2014). 9. Mandal, A. K. Degree Physical and General Chemistry Sarat Book House 10. Pahari, S., Physical Chemistry New Central Book Agency 11. Palit, S.R., Practical Physical Chemistry Science Book Agency			

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	specific conductance and molar conductance; Variation of specific and equivalent conductance with dilution for strong and weak electrolytes; Kohlrausch's law of independent migration of ions; Equivalent and molar conductance at infinite dilution and their determination for strong and				

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	weak electrolytes; Ostwald's dilution law;				
CC3/GE 3 Practical	Qualitative semimicro analysis of mixtures containing two radicals. Emphasis should be given to the understanding of the chemistry of different reactions.	1. Ghosal, Mahapatra & Nad, *An Advanced Course in Practical Chemistry*, New Central	23	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
SEC-A-2	Biochemistry of disease: A diagnostic approach by	1. Cooper, T.G. Tool of Biochemistry. Wiley-Blackwell (1977).	10	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
ANALYTICAL CLINICAL BIOCHEMISTRY	blood/ urine analysis.	2. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009). 3. Varley, H., Gowenlock, A.H & Bell, M.: Practical Clinical Biochemistry, Heinemann, London (1980). 4. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.		2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC-4-9-TH Physical CHEMISTRY -4	Vapour pressure of solution; Ideal solutions, ideally diluted solutions and colligative properties; Raoult's law; Thermodynamic	. Levine, I. N. Physical Chemistry, 6th Edition , McGraw-Hill India 2. Castellan, G. W. Physical Chemistry, Narosa 3. McQuarrie, D. A. & Simons, J. D. Physical Chemistry: A Molecular Approach, Viva Press 4. Kapoor K.L, A Text Book Of Physical	60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	derivation using chemical potential to derive relations between the four colligative properties	Chemistry , McGraw Hill India of Thermodynaamics by K.L. Kapoor Vol-4		photocopy of prepared notes 4. E book	
CEMA-CC-4-9-P PRACTICALS	Kinetic study of inversion of cane sugar using a Polarimeter (Preferably Digital) Experiment 2: Study of Phase diagram of Phenol-Water system. Experiment 3: Determination	1 Viswanathan, B., Raghavan, P.S. Practical Physical Chemistry Viva Books (2009) 2. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson 3. Harris, D. C. Quantitative Chemical Analysis. 9th Ed., Freeman (2016) 4. Palit, S.R., De, S. K. Practical Physical Chemistry Science Book Agency 5. Levitt, B. P. edited Findlay's Practical Physical Chemistry Longman Group Ltd. 6. Gurtu, J.	45	Offline method 1. Traditional method through the use of the chalk and board	

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	of partition coefficient for the distribution of I2 between water and CCl4 Experiment 4: Determination of pH of unknown solution (buffer), by colour matching method Experiment 5: pH-metric titration of acid (mono- and di-basic) against strong base Experiment 6 : pH-metric	N., Kapoor, R., Advanced Experimental Chemistry S. Chand & Co. Ltd. 7. Practical Workbook Chemistry (Honours), UGBS, Chemistry, University of Calcutta, 2015 2. *Practical Workbook Chemistry (Honours), UGBS, Chemistry*, University of Calcutta, 2015.			

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	titration of a tribasic acidagainst strong base.				
CC/GE 4	Quantum Chemistry and spectroscopy	Dutta, S.K., Physical Chemistry Experiments Bharati Book Stall	44	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
CEMA-CC5-11-Th	Statistical Thermodynamics and numerical analysis	7. Levine, I. N. Quantum Chemistry, 7th Edition,Pearson India 8. Maron, S. & Prutton Physical Chemistry 9. Ball, D. W.	10	Offline method 1. Traditional method through the use of the chalk and board	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

Planned					
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Physical Chemistry, Thomson Press 10. Mortimer, R. G. Physical Chemistry, Elsevier 11.Glasstone, S. & Lewis, G.N. Elements of Physical Chemistry 12. Rakshit, P.C., Physical Chemistry Sarat Book House 14. Klotz, I.M., Rosenberg, R. M. Chemical Thermodynamics:Basic Concepts and Methods , Wiley		2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	
			60	Offline method 1. Traditional method through the use of the chalk and board 2. Project-Based Learning 3. Consulting different reference books and photocopy of prepared notes 4. E book	

LESSON PLAN

Department Name:Chemistry

Name of Faculty: Dr. Ishita Saha

Paper Name & Code:

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Course Name: Four-Year B.A./B.Sc Chemistry (Honours and Honours with Research) Course

Semester: 1

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CHEM-H-CC1-1-Th/Module : I	Effective nuclear charge. Shielding and penetration; Slater's rule. The general idea about modern periodic table, atomic and ionic radii, ionization energy, electron affinity and electro negativity –definition, trends of variation in periodic table and their application in explaining and predicting the chemical behavior of elements and compounds. Electronegativity scales (Pauling's, Mulliken's and Allred-Rochow's scales). Inert pair effect.	**Atkins, Overton, Rourke , Weller , Armstrong; Shriver & Atkins' Inorganic Chemistry, 5th Ed., Oxford University Press (2010)**	8	Face-to-face demonstrations, modelling and interactive discussions	
CHEM-H-SEC1-1-Th/Module : I	**Introduction to Quantitative analysis and its interdisciplinary nature**: **(15 Lectures)** Definitions of analysis, determination, measurement, techniques and methods. Classification of analytical techniques. Choice of an analytical method -	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	15	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	accuracy, precision, sensitivity, selectivity, method validation. Figures of merit of analytical methods and limit of detection (LOD). Limitations of analytical methods . Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors. Statistical treatment of finite samples - mean, median, range, standard deviation and variance. External standard calibration -regression equation (least squares method), correlation coefficient (R_2). Presentation of experimental data and results from the point of view of significant figures. **Numerical problems are to be solved wherever applicable.**				
CHEM-H-IDC1-1-Th/Module : I	**Introduction to Quantitative analysis and its interdisciplinary nature**: Definitions of analysis, determination, measurement, techniques and methods. Classification of analytical techniques. Choice of an analytical method -accuracy, precision,	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	10	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	sensitivity . Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors. Statistical treatment of finite samples - mean, median, range, standard deviation and variance. External standard calibration -regression equation (least squares method), correlation coefficient (R_2). Presentation of experimental data and results from the point of view of significant figures.				
		Total	33		

Semester: 2

Planned	After Implementation

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
CHEM-H-CC2-2-Th/ Module : II	i) Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its application and limitations. Packing of ions in crystals. Born-Lande equation with derivation and importance of Kapustinskii expression for lattice energy. Madelung constant, Born-Haber cycle and its application, Solvation energy. Defects in solids (elementary idea). Solubility energetics of dissolution process. ii) Covalent bond: Polarizing power and polarizabilty, ionic potential, Fajan's rules	**J. E. Huheey, E. A. Keiter, R. L. Keiter, Okhil K. Medhi , Principles of Structure and Reactivity, 5th Edition ,Pearson India, 2022**	8	Face-to-face demonstrations, modelling and interactive discussions	
CHEM-H-IDC2-2-Th/Module: I	**Introduction to Quantitative analysis and its interdisciplinary nature**: Definitions of analysis, determination, measurement, techniques and methods. Classification of analytical techniques. Choice of an analytical method -accuracy, precision, sensitivity . Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors. Statistical treatment of finite samples - mean, median, range, standard deviation and variance. External	**Douglas A. Skoog, D.M. West , F. james Holler , Stanely R. Crouch, Fundamentals of Analytical Chemistry , Cengage learning India Pvt Ltd. 10th Edition , 2022**	10	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	standard calibration -regression equation (least squares method), correlation coefficient (R_2). Presentation of experimental data and results from the point of view of significant figures.				
		Total	18		

Course Name: Three-Year B.A./B.Sc Chemistry (Honours) under CBCS

Semester: 3

Planned	After Implementation

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
CC-3-6-TH/ INORGANIC CHEMISTRY-3	Chemical periodicity, Chemistry of s and p Block Elements	**J. E. Huheey, E. A. Keiter, R. L. Keiter, Okhil K. Medhi , Principles of Structure and Reactivity, 5th Edition ,Pearson India, 2022**	30	Face-to-face demonstrations, modelling and interactive discussions	
CC-3-6-P/ INORGANIC CHEMISTRY Practical	Complexometric titration, Chromatography of metal ions, Gravimetry	Practical Workbook Chemistry (Honours), UGBS, Chemistry, University of Calcutta, 2015	45	Face-to-face demonstrations, hand on experiment and interactive discussions	
		Total	75		

Semester: 4

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CC-4-10-TH/ INORGANIC CHEMISTRY-4	d-d transitions; L-S coupling; qualitative Orgel diagrams… …charge transfer spectra, Chemistry of f- block elements Inorganic Reaction Kinetics and	**J. E. Huheey, E. A. Keiter, R. L. Keiter, Okhil K. Medhi , Principles of Structure and Reactivity, 5th Edition ,Pearson India, 2022**	30	Face-to-face demonstrations, modelling and interactive discussions	

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
	Mechanism				
CC-4-10-P	Inorganic preparations, Instrumental Techniques: 1. Measurement of 10Dq by spectrophotometric method. 2. Determination of λ_{max}	Inorganic Synthesis, Vol. 1-10.	45	Face-to-face demonstrations, hand on experiment and interactive discussions	
		Total	75		

Semester: 5

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
DSE(B)-5-1-TH/INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	Surface Coatings, Alloys, Catalysis, Chemical explosives	J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.	30	Face-to-face demonstrations, modelling and interactive discussions	
		Total	30		

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Semester: 6

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CC-6-13-TH/ INORGANIC CHEMISTRY-5	Theoretical Principles in Qualitative Analysis of anions, Organometallic Chemistry	Cotton, F.A., Wilkinson, G., Murrillo, C. A., Bochmann, M., Advanced Inorganic Chemistry 6th Ed. 1999.,Wiley.	30	Face-to-face demonstrations, modelling and interactive discussions	
DSE(B)-6-4-TH/ DISSERTATION	Topics on inorganic and analytical chemistry		105	Guidance and support for research or review work	
		Total	135		

Course Name: Three-Year B.A./B.Sc Chemistry (Multidisciplinary) Course

Semester: 1

Planned	After Implementation

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
		Total	0		

Semester: 2

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
		Total	0		

Course Name: Three-Year B.A./B.Sc Chemistry (general) Course under CBCS

Semester: 3

Planned	After Implementation

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
CC 3/GE 3 TH	Chemical Bonding : Ionic and covalent bonding Chemical Bonding : MO Approach Comparative study of p-block elements Transition Elements (3d series and Lanthanoids and actinoid) Coordination Chemistry	Lee, J. D. Concise Inorganic Chemistry,5th Ed., Wiley India Pvt. Ltd., 2008.	20	Face-to-face demonstrations, modelling and interactive discussions	
CC 3/GE 3 Practical	Qualitative semimicro analysis of mixtures containing two inorganic radicals	Svehla & Sivasankar , Vogel's Qualitative Inorganic Analysis, 7th Ed., Pearson, 2012.	22	Face-to-face demonstrations, hand on experiment and interactive discussions	
SEC(A)-3-1-TH Basic Analytical Chemistry	Introduction to Analytical Chemistry, Chromatography, Ion-exchange, Suggested Applications, Suggested Instrumental demonstrations	Willard, H. H. Instrumental Methods of Analysis, CBS Publishers.	15	Face-to-face demonstrations, modelling and interactive discussions	
		Total	62		

Semester: 4

Planned	After Implementation

LESSON PLAN

Department Name: Chemistry

Name of Faculty: Dr. Soumavo Ghosh

Unit / Group / Module / Article	Topics	Reference Books	No of Lecture Planned	Content Delivery Technique	Remarks / Comments
CC 4/GE 4 TH	Crystal Field Theory	Lee, J. D. Concise Inorganic Chemistry,5th Ed., Wiley India Pvt. Ltd., 2008	20	Face-to-face demonstrations, modelling and interactive discussions	
CC 4/GE 4 P	1.Qualitative Analysis of Single Solid Organic Compound 2. Identification of a pure organic compound	Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education.	22	Face-to-face demonstrations, hand on experiment and interactive discussions	
SEC(B)-4-3-TH PHARMACEUTICALS CHEMISTRY	Fermentation	Foye, W.O., Lemke, T.L. & William, D.A.: Principles of Medicinal Chemistry, 4th ed., B..I. Waverly Pvt. Ltd. New Delhi.	10	Face-to-face demonstrations, modelling and interactive discussions	
		Total	52		

Semester: 5

LESSON PLAN

Department Name: Chemistry

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Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
DSE(A)-5-2-TH INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	Surface Coatings, Alloys, Catalysis, Chemical explosives	J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.	30	Face-to-face demonstrations, modelling and interactive discussions	
DSE(A)-5-2-P	1 . Determination of free acidity in ammonium sulphate fertilizer. 2. Estimation of phosphoric acid in superphosphate fertilizer. 3. Determination of composition of dolomite (by complexometric titration). 4. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples. 5. Analysis of Cement.	Practical Workbook Chemistry (Honours), UGBS, Chemistry, University of Calcutta, 2015	45	Face-to-face demonstrations, hand on experiment and interactive discussions	
SEC(A)-5-2-TH ANALYTICAL	Biochemistry of disease: A diagnostic approach by blood/ urine analysis	Varley, H., Gowenlock, A.H & Bell, M.: Practical	10	Face-to-face demonstrations, modelling and	

LESSON PLAN

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Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
CLINICAL BIOCHEMISTRY		Clinical Biochemistry, Heinemann, London (1980).		interactive discussions	
		Total	85		

Semester: 6

Planned				After Implementation	
Unit / Group / Module / Article	**Topics**	**Reference Books**	**No of Lecture Planned**	**Content Delivery Technique**	**Remarks / Comments**
SEC(B)-6-4-TH PESTICIDE CHEMISTRY	General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides,	R. Cremlyn: Pesticides, John Wiley.	15	Face-to-face demonstrations, modelling and interactive discussions	
		Total	15		