

COURSE TEMPLATE

1.	Department / Centre proposing the course	Chemistry
2.	Course Title (<i>< 45 characters</i>)	INTRODUCTION TO CHEMISTRY
3.	L-T-P structure	3 - 0 - 0
4.	Credits	3
5.	Course number	CYL100
6.	Status (<i>category for program</i>)	First-Year Core

7.	Pre-requisites (<i>course no./title</i>)	None
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8.	Status vis-à-vis other courses (<i>give course number/title</i>)	
8.1	Overlap with any UG/PG course of the Dept./Centre	No
8.2	Overlap with any UG/PG course of other Dept./Centre	No
8.3	Supercedes any existing course	No

9.	Not allowed for (<i>indicate program names</i>)	NA
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10.	Frequency of offering	☒ Every sem ☐ 1 st sem ☐ 2 nd sem ☐ Either sem
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11.	Faculty who will teach the course All faculty members in the department.	
12.	Will the course require any visiting faculty?	No

13.	Course objective (<i>about 50 words</i>): Everything in the environment, whether naturally occurring or man made, is composed of chemicals. This course aims at providing introduction to the basic knowledge and concepts of chemistry. The objective of the course is the learning of composition, properties and behavior of matter.	
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14.	Course contents (<i>about 100 words</i>) (<i>Include laboratory/design activities</i>): Quantum mechanical principles of structure and bonding. Free energy and entropy changes in chemical processes. Phase diagram. Coordination chemistry. Bioinorganic chemistry. Organometallic chemistry. Materials of interest in chemistry. Stereochemistry. Reactivity of molecules. Strategies for carbon-carbon bond formation.	
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15. Lecture Outline *(with topics and number of lectures)*

Module no.	Topic	No. of hours
1	Schrodinger equation and postulates of quantum mechanics	3
2	Applications of quantum theory to chemical systems	7
3	Free energy and entropy changes in chemical processes	7
4	Phase diagram	3
5	Coordination Chemistry: Electronic spectra and magnetic properties of complexes [Crystal Field Theory (CFT) treatment], tetragonal distortion and drawbacks of CFT	3
6	Bioinorganic Chemistry: Structure and function of hemoglobin and myoglobin, role of main group elements in biological systems	3
7	Organometallics: 18 electron rule, bonding in metal carbonyls, homogeneous and heterogeneous catalysis	3
8	Materials of interest in chemistry: Synthesis, structure, and properties of zeolites, polysiloxanes, polysilanes, etc.	2
9	Stereochemistry: general introduction, topicity, axial chirality, Cram's rule	3
10	Reactivity of molecules: factors influencing acidity, basicity, and nucleophilicity of molecules, kinetic vs. thermodynamic control of reactions	4
11	Strategies for carbon-carbon bond formation: substitution, elimination, rearrangement, stereochemical aspects of reaction mechanism.	4
12		
COURSE TOTAL (14 times 'L')		42

16. Brief description of tutorial activities

NA

17. Brief description of laboratory activities

Module no.	Experiment description	No. of hours
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
COURSE TOTAL (14 times 'P')		

18. Suggested texts and reference materials

STYLE: Author name and initials, Title, Edition, Publisher, Year.

- Atkins, P.; de Paula, J. Physical Chemistry, 9th Edition, Oxford University Press, 2010. - McQuarrie, D. A.; Simon, J. D. Physical Chemistry: A Molecular Approach, 1st Edition, University Science Books, 1997. - Levine, I. Physical Chemistry, 6th Edition, McGraw Hill Science, 2008.
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- Engel, T.; Reid, P. Physical Chemistry, 3rd Edition, Prentice Hall, 2012.
- Huheey, J. E.; Keiter, E. A.; Keiter, R. L.; Medhi, O. K. Inorganic Chemistry - Principles of Structure and Reactivity, 4th Edition, Pearson Education, 2006.
- Gupta, B. D.; Elias, E. J. Basic Organometallic Chemistry - Concepts, Syntheses, and Applications, 1st Edition, Universities Press, 2010.
- Graham Solomons, T. W. Organic Chemistry, 10th Edition, Wiley, 2009.
- Morrison and Boyd, Organic Chemistry, 6th Edition, Prentice Hall, 2007.

19. Resources required for the course (*itemized & student access requirements, if any*)

19.1	Software	
19.2	Hardware	
19.3	Teaching aides (videos, etc.)	
19.4	Laboratory	
19.5	Equipment	
19.6	Classroom infrastructure	
19.7	Site visits	

20. Design content of the course (*Percent of student time with examples, if possible*)

20.1	Design-type problems	
20.2	Open-ended problems	
20.3	Project-type activity	
20.4	Open-ended laboratory work	
20.5	Others (please specify)	

Date:

(Signature of the Head of the Department)