First BOARD OF STUDIES MEETING

28th August, 2017

Department of Chemistry and Chemical Sciences
School of Physical and Material Sciences

Minutes of the Meeting

CENTRAL UNIVERSITY OF HIMACHAL PRADESH
[Established under the Central Universities Act 2009]
Dharamshala, District Kangra - 176215 (HP)
www.cuhimachal.ac.in

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Agenda Index

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	Introduction of members	
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CCS-BoS-1/17-2	Approval of the minutes of the CDC meeting and Courses suggested by the CDC members which are to be offered at PG Level in the Department of Chemistry and Chemical Sciences	Annexure-II
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The first Meeting of Board of Studies (BoS) of the Department of Chemistry and Chemical Sciences, SoPMS was held on 28th August, 2017 at TAB Shahpur. Please find below the Minutes against each Agenda items:-

Agenda Item No. - CCS-BoS-1/17-1: Rules for Business for the conduct of the meeting of Board of Studies:

For the conduct of the meeting of Board of Studies the Executive Council of the University has approved Regulation No. 4. The Regulation given in Annexure-I is placed before the BoS for approval.

Decision:
All members agreed and approved it.

Agenda Item No. - CCS-BoS-1/17-2: Approval of Courses to be offered at PG Level in the Department of Chemistry and Chemical Sciences as Suggested by the Curricular Development Committee

To decide about the courses to be offered to the students of M.Sc. Chemistry as per the guidelines of UGC and Choice Based Credit System, a curricular Committee was constituted. The Committee held its meeting on 15th May, 2017. The details of the courses suggested by Curricular Development Committee Meeting have been placed before the members of the board for their approval.
The list of courses, respective course code, credits, detail syllabus and level is attached as Annexure II.

Decision:
All members agreed and approved it.

Agenda Item No. - CCS-BoS-1/17-3: Approval of the Expert's List for the Department of Chemistry and Chemical Sciences. The Expert's list is given in Annexure-III.

Decision:
All members agreed and approved it.

Agenda Item No. - CCS-BoS-1/17-4: Any Other Item with the Permission of the Chair

Following suggestions have been made by the Subject Experts and Board members:

(10)

1. In the 3rd semester students may take courses from other specialization (2 credits). But considering the present infrastructure the existing concept of offering specialization from 3rd semester may retain.
2. Some more books have been suggested.
3. Few "experts" have been incorporated in the Experts member list.

All the Agenda items are approved by the BOS.

28/8/17

Dr. Subhankar Chatterjee
(Member)

-absent-

Dr. Vikram Singh
(VC's Nominee)

Dr. Dilbag Singh
(VC's Nominee)

28/8/2017

Prof. Gurmeet Singh
(Subject Expert)

Dr. B.C. Chauhan
(Chairman and Convener)

(11)

1. In the 3rd semester students may take courses from other specialization (2 credits). But considering the present infrastructure the existing concept of offering specialization from 3rd semester may retain.
2. Some more books have been suggested.
3. Few experts have been incorporated in the Experts member list.

One of the Subject expert, Prof. Sashi Kant Sharma, Shimla University was absent due to some urgent official work.

All the Agenda items are approved by the BOS.

28/8/17

Dr. Subhankar Chatterjee
(Member)

- absent -

Dr. Vikram Singh
(VC's Nominee)

Dr. Dilbag Singh
(VC's Nominee)

28/8/2017

Prof. Gurmeet Singh
(Subject Expert)

Dr. B.C. Chauhan
(Chairman and Convener)

ANNEXURE-II

Proposed structure of courses to be offered in the Department of Chemistry and Chemical Sciences as per new Choice Bases Credit System (CBCS). A student needs to complete 80 credits to get Masters Degree.

CORE COMPULSORY COURSES

A student has to offer 40 credits from core compulsory courses				
Sr. No.	**Course Code**	**Course Name**	**Credits***	**Pre-requisite/ Remarks**
1	CCS 401	Organic Chemistry I	4	
2	CCS 402	Inorganic Chemistry I	4	
3	CCS 403	Physical Chemistry I	4	
4	CCS 404	Organic Chemistry Lab I	2	
5	CCS 405	Inorganic Chemistry Lab I	2	
6	CCS 406	Physical Chemistry Lab I	2	
7	CCS 407	Organic Chemistry II	4	
8	CCS 408	Inorganic Chemistry II	4	
9	CCS 409	Physical Chemistry II	4	
10	CCS 501	Chemistry General (Interdisciplinary Topics)	4	
11	CCS 556	Major Project	6	

**60 Lectures are recommended for 4 Credit courses & 30 Lectures are recommended for 2 Credit courses

CORE OPEN COURSES

A student has to offer 12 credits from core open courses				
Sr. No.	**Course Code**	**Course Name**	**Credits***	**Pre-requisite/ Remarks**
1.	CCS 410	Biophysical and Material Chemistry	2	
2.	CCS 411	Statistical error, electrochemical analyses, environmental analyses	2	
3.	CCS 412	Catalysis and green chemistry	2	
4.	CCS 413	Environmental chemistry	2	
5.	CCS 414	Chemistry of Xenobiotics Biodegradation-I	2	
6.			2	
7.	CCS 538	Biochemistry-I	4	
8.	CCS 539	Biochemistry-II	2	
9.	CCS 540	Advanced stereochemistry	4	
10.	CCS 541	Computer applications in chemistry-I		

11.	CCS 542	Computer applications in chemistry-II	4	
12.	CCS 543	Group theory and its applications in bonding	2	
13.	CCS 544	Structure and properties of solids	2	
14.	CCS 545	Chemistry of elements	2	
15.	CCS 546	Advanced bioinorganic chemistry	2	
16.	CCS 547	Biophysical chemistry	2	
17.	CCS 548	Data analysis & mathematical methods in chemistry	2	
18.	CCS 549	Electronic spectroscopy (absorption and emission)	2	
19.	CCS 550	Advanced statistical thermodynamics and symmetry	4	
20.	CCS 551	Physical methods of analysis and structure determination	4	
21.	CCS 552	Synthetic methodology & strategy	2	
22.	CCS 553	Chemoinformatics	2	
23.	CCS 554	Advance Bioorganic Chemistry	2	
24.	CCS 555	Advance Bio-Analytical techniques	2	
25.	CCS 556	Metabolomics and Biomarker study-I	2	
26.	CCS 557	Organic structure elucidation, characterization by spectrophotometry	2	
27.	CCS 558	Advance characterization techniques (FESEM,HRTEM, AFM, XRD)	4	
28.		Mathematics for Chemists	2	
29.				
30.				
31.				

*60 Lectures are recommended for 4 Credit courses & 30 Lectures are recommended for 2 Credit courses

ELECTIVE SPECIALIZATION

(A student has to offer 16 credits from elective specialisation)
[CHOOSE 16 CREDITS FROM ANY ONE GROUP]

Note: A specialization shall only be offered if minimum 10 students have opted for it.

Specialization I: ORGANIC CHEMISTRY SPECIALIZATION				
Sr. No.	**Course Code**	**Course Name**	**Credits***	**Pre-requisite/ Remarks**
1	CCS 502	Organic Chemistry Specialization I	4	
2	CCS 503	Organic Chemistry Specialization II	4	
3	CCS 504	Organic Chemistry Specialization III	4	
4.	CCS 505	Organic Chemistry Specialization IV	4	

	CCS 506	Organic Chemistry Specialization V	2	
6.	CCS 507	Organic Chemistry Specialization VI	2	
7.	CCS 508	Organic Chemistry Specialization VII	2	
8.	CCS 509	Organic Chemistry Specialization VIII	2	
9.	CCS 510	Advance Organic Chemistry Lab I	2	
10.	CCS 511	Advance Organic Chemistry Lab II	2	
11.	CCS 512	Advance Organic Chemistry Lab III	2	
12.	CCS 513	Advance Organic Chemistry Lab IV	2	

Specialization II: INORGANIC CHEMISTRY SPECIALIZATION

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/ Remarks
1	CCS 514	Inorganic Chemistry Specialization I	4	
2	CCS 515	Inorganic Chemistry Specialization II	4	
3	CCS 516	Inorganic Chemistry Specialization III	4	
4.	CCS 517	Inorganic Chemistry Specialization IV	4	
5.	CCS 518	Inorganic Chemistry Specialization V	2	
6.	CCS 519	Inorganic Chemistry Specialization VI	2	
7.	CCS 520	Inorganic Chemistry Specialization VII	2	
8.	CCS 521	Inorganic Chemistry Specialization VIII	2	
9.	CCS 522	Advance Inorganic Chemistry Lab I	2	
10.	CCS 523	Advance Inorganic Chemistry Lab II	2	
11.	CCS 524	Advance Inorganic Chemistry Lab III	2	
12.	CCS 525	Advance Inorganic Chemistry Lab IV	2	

Specialization III: PHYSICAL CHEMISTRY SPECIALIZATION

Sr. No.	Course Code	Course Name	Credits	Pre-requisite/ Remarks
1	CCS 526	Physical Chemistry Specialization I	4	
2	CCS 527	Physical Chemistry Specialization II	4	
3	CCS 528	Physical Chemistry Specialization III	4	
4.	CCS 529	Physical Chemistry Specialization IV	4	
5.	CCS 530	Physical Chemistry Specialization V	2	
6.	CCS 531	Physical Chemistry Specialization VI	2	
7.	CCS 532	Physical Chemistry Specialization VII	2	
8.	CCS 533	Physical Chemistry Specialization VIII	2	
9.	CCS 534	Advance Physical Chemistry Lab I	2	
10.	CCS 535	Advance Physical Chemistry Lab II	2	
11.	CCS 536	Advance Physical Chemistry Lab III	2	
12.	CCS 537	Advance Physical Chemistry Lab IV	2	

*60 Lectures are recommended for 4 Credit courses & 30 Lectures are recommended for 2 Credit courses

ELECTIVE OPEN COURSES

[For the students of the Department and students of other departments]

A students can offer 4 credits from this list of courses				
Sr. No.	**Course Code**	**Course Name**	**Credits**	**Pre-requisite/ Remarks**
1.	CCS 415	Green Chemistry and its application	2	
2.	CCS 416	Alchemy to modern Chemistry	2	
3.	CCS 417	Biosafety issues & Research ethics	2	
4.	CCS 418	Chemical data analysis	2	
5.	CCS 559	Advance Analytical techniques	2	
6.	CCS 560	Computational Chemistry	2	
7.	CCS 561	Food Chemistry	2	
8.	CCS 562	Clinical Chemistry	2	
9.	CCS 563	Chemistry of Organic materials	2	
10.	CCS 564	Assymatric organic synthesis/catalysis	2	
11.				
12.				
13.				
14.				
15.				

M.Phil & Ph.D. Courses:

Sr. No.	**Course Code**	**Course Name**	**Credits**	**Pre-requisite/ Remarks**
1.	CCS 599	Dissertation (M.Phil.)	20	
2.				
3.	CCS 601	Chemistry of Xenobiotics Biodegradation-II	6	
4.	CCS 602	Metabolomics and Biomarker study-II	6	
5.	CCS 603	Analytical Techniques in Metabolomics research	6	
6.	CCS 604	Microbial Metabolism for pollutant abatement-biochemical pathway analysis	6	
7.	CCS 699	Thesis (Ph.D.)	60	

Name of the Topics for the course proposed above:-

[*Faculties can modify the content as per their convenience and requirement*]

ORGANIC CHEMISTRY:

Bonding in Organic Compounds

Stereochemistry and Conformational Analyses

Organic Reaction Mechanism

Pericyclic Reactions

Heterocyclic Chemistry

Chemistry of Natural Products-I

Advanced Organic Syntheses-I

Advanced Organic Syntheses-II

Chemistry of natural Products-II

Mass spectrometry

Nuclear Magnetic Resonance (NMR) Spectroscopy

Techniques of Chemical Separation

Green Chemistry

Organometallic Chemistry of Transitional Elements

Synthetic Methodology II

Advanced Pericyclic Reactions

Dynamic Aspects of Stereochemistry

Advance Heterocyclic Chemistry

Organometallic Reagents in organic syntheses and Structure Determination of Organic Compounds

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Oxidation and Reduction of Functional Groups

Photo Organic Chemistry and Free Radical Reactions

Advance Spectroscopy

Chemistry of Medicinally Important Molecules

Synthetic methodology and strategy of few compounds

INORGANIC CHEMISTRY

Aspects of Chemical Bonding

Theory of Coordination Chemistry

Chemistry of d- and f- Block Elements (Comparative Study)

Organometallic Chemisty

Molecular Clusters

Bioinorganic Chemistry

Group theory and its Applications in Spectroscopy

Advanced Organometallic Chemistry

Nuclear Chemistry

NMR, ORD/CD

EPR, NQR, Mossbauer

I.R., Raman, Mass, PES, ESCA

Analytical techniques: Isolation, Characterization and Structure Determination

Inorganic Analyses

Inorganic Reaction Mechanism

Magnetochemistry

Solid state chemistry and X-ray crystallography

Inorganic Photochemistry

Chemistry of Complex Equilibria

Synthetic Methodology for Transition and Non-transition Metal Compounds

Inorganic substitution reactions Mechanism

Chemical Application of Group Theory

Principle of symmetry in Chemistry

Catalysis

Inorganic Polymers

PHYSICAL CHEMISTRY

Thermodynamics

Surface Chemistry and dielectric Behaviour

Molecular spectroscopy, structure and properties

Quantum Mechanics

Atomic structure and Spectroscopy

Chemical Kinetics and Reaction Dynamics

Advanced Quantum Mechanics-I

Advanced Quantum Mechanics-II

Perturbation Theory:

Statistical Mechanics-I

Group Theory-Introduction

Photochemistry

Electrochemistry

Group Theory-Applications

Solid State Chemistry

Polymers

Advanced Quantum Mechanics-III

Statistical Mechanics-II

Non-Equilibrium Thermodynamics and Quantum Statistics

Principles & Basic Instrumentation of NMR/ESR/NQR/Mossbauer Spectra

Applications of NMR/ESR/Mossbauer Spectra

Introduction to 2D NMR: NOESY, COSY, HETCOR, HOMCOR, INADEQUATE, INDOR, INEPT for simple compounds and problems.

Advance Molecular Spectroscopy-I

UV-VIS Spectroscopy:

IR Spectroscopy:

Advance Molecular Spectroscopy-II

CHEMISTRY GENERAL (INTERDISCIPLINARY TOPICS)

Supramolecular Chemistry

Nanoscience and Technology

Medicinal Chemistry

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Any Other Course Suggested by BOS members:

Will Discuss in Next Meeting. for Specilized Paper.

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SEMESTER WISE COURSE STRUCTURE-DEPARTMENT OF CHEMISTRY-CUHP

Semester	Total Credits	Core Compulsory	Credits	Credits	Core Open	Credits
I	16	CCS 401- Organic Chemistry I	4			
		CCS 402 - Inorganic Chemistry I	4			
		CCS 403 - Physical Chemistry I	4			
		CCS 404 - Organic Chemistry Lab I	2			
		CCS 405 - Inorganic Chemistry Lab I	2			
II	14	CCS 406 - Physical Chemistry Lab I	2	2		
		CCS 407 - Organic Chemistry II	4			
		CCS 408 - Inorganic Chemistry II	4			
		CCS 409 - Physical Chemistry II	4			
III	4	Chemistry General-(Interdisciplinary topics)	4	6		
IV	6	Major Project	6	4	Computer applications in chemistry-I	4
					Computer applications in chemistry-II	4
Semester	**Total Credits**	**Elective specialization**		**Semester**	**Total Credits**	**Elective specialization**	**Credits**
III	8			IV	8		
		Advance Organic/Inorganic/Physical Chemistry Lab	2			Advance Organic/Inorganic/Physical Chemistry Lab	2
Semester	**Total Credits**	**Human Making & Skill Development courses**	2	**Semester**	**Credits**	**Elective Open**	**Credits**
I	4	HM -I	2	III	2		2
		SD- I	2				2
II	4	HM -II	2	IV	2		2
		SD- II	2				2

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SEMESTER WISE COURSE STRUCTURE-DEPARTMENT OF CHEMISTRY-CUHP

SEMESTER	SUBJECT	CREDITS	TOTAL CREDITS
I	CORE COMPULSORY	16	20
	CORE OPEN	00	
	ELCTIVE SPECIALIZATION	00	
	HM+SD	04	
	ELECTIVE OPEN	00	
II	CORE COMPULSORY	14	20
	CORE OPEN	02	
	ELCTIVE SPECIALIZATION	00	
	HM+SD	04	
	ELECTIVE OPEN	00	
III	CORE COMPULSORY	04	20
	CORE OPEN	06	
	ELCTIVE SPECIALIZATION	08	
	HM+SD	00	
	ELECTIVE OPEN	02	
IV	CORE COMPULSORY	06	20
	CORE OPEN	04	
	ELCTIVE SPECIALIZATION	08	
	HM+SD	00	
	ELECTIVE OPEN	02	
TOTAL CREDITS			80

Inorganic Chemistry Books

1. Advanced Inorganic Chemistry- F. A. Cotton & G. Wilkinson, John Wiley
2. Inorganic Chemistry- J.E. Huheey, E.A. Keiter & R. L. Keiter, Harper & Row
3. Chemistry of Elements- N. N. Greenwood & A. Earnshaw
4. Concept and Models of Inorganic Chemistry-Douglass, McDaniel & Alexander
5. Coordination Chemistry- S. F. A. Kettle
6. Theoretical Approach to Inorganic Chemistry-A. F. Willams
7. Inorganic Chemistry-D. F. Shriver, P. W. Atkins & C. H. Langford
8. Chemical Applications of Group theory- F. A. Cotton
9. Molecular Symmetry & Group Theory- R. L. Carter
10. Introduction to Ligand Fields- B. N. Figgis
11. Introduction to Ligand Field Theory- C. J. Ballahausen
12. Valence- C. A. Coulson
13. Chemical Crystallography-L. W. Bunn
14. Solid State Chemistry- C. N. R. Rao
15. Ionic Crystal Lattice & Nonstoichiometry-N. N. Greenwood
16. Inorganic Reaction Mechanism- M. L. Tobe
17. Mechanism of Inorganic Reactions- Katakis & Gordon
18. Kinetics and Mechanism of Reactions of Trans. Metal Complexes- R. G. Wilkins
19. Determination and use of Stability Constants- A. E. Martell & R. J. Motekaitis
20. An Introduction to Bioinorganic Chemistry-D. R. Williams
21. Inorganic Chemistry of Biological Processes-M. N. Hughes
22. Bioinorganic Chemistry-E. I. Ochiai
23. Bioinorganic Chemistry- R. W. Hay
24. Elements of Bioinorganic Chemistry- G. N. Mukherjee & A. Das
25. Organometallic Chemistry of Transition Metals-R.H. Cabtree
26. Organometallic Chemistry- R. C. Mehrotra & A. Singh

27. Nuclear and Radio Chemistry-Friedlander, Kennedy & Miller

28. Radioactiviry Applied to Chemistry- A. C. Wahl & N. A. Bonner

29. Magnetochemistry- Selwood

30. Intriduction to Magnetochemistry- Earnshaw

31. Environmental Analysis- S. M. Khopkar

32. Physical Methods in Inorganic Chemistry-R. S. Drago

33. Instrumental Methods in Chemical Analysis- Willard, Meritt and Dean

34. Instrumental Methods in Chemical Analysis- G. W. Ewing

35. Vogel`s Text Book of Quantitative Chemical Analysis G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denny

36. Advanced Experiments in Inorganic Chemistry-G. N. Mukherjee (U. N. Dhur)

37. Macro and Semi-micro Qualitative Inorganic Analysis- A. I. Vogel

38. Semi-Micro Qualitative Inorganic Analysis- G. N. Mukherjee (C.U.Press)

39. Quantitative Chemical Analysis- Kolthoff, Sandel, Meehan & Bruckenstein

40. Synthesis and Characterizations if inorganic Compounds-W. L. Jolly

41. Group Theory : Bishop (D.M)

24

Organic Chemistry Books

1. Organic Chemistry- I. L. Finar, Vols. 1 & 2, ELBS

2. .Adv. Organic Chemistry: Reaction, Mechanism- Jerry March

3. Adv. Organic Chemistry-F. A. Carey & R. J. Sundberg

4. Organic Chemistry (3rd. edn) -Hendrikson, Cram, Hammond

5. Organic Chemistry- Clayden, Greeves, Warren & Wolthers

6. Organic Chemistry- R. T. Morrison & R. N. Boyd

7. Organic Reaction Mechanics- A. Gallego, M. Gomer & M. A. Sierra

8. A Guide Book to Mechanism of Organic Reactions-Peter Sykes

9. Reaction Mechanism in Organic Chemistry- S. M. Mukherjee & S. P. Singh

10. Structure and Mechanism in Organic Chemistry- C. K. Ingold

11. Physical Organic Chemistry-J. Hiine

12. Physical Organic Chemistry-N. S. Isaacs

13. Orbital Symmetry and Organic Reactions-T. L. Gilchrist & R. C. Storr

14. Some Modern Methods in Organic Synthesis-W. Carruthers

15. Principles of Organic Synthesis-Norman, Coxon & Blakie

16. Current Trends in Organic Synthesis-C.Scolastico & F. Nicotra

17. Frontier Orbitals and Organic Chemcal Reactions-I. Fleming

18. Pericyclic Reactions- Gill & Willis

19. Pericyclic Reactions- S. M. Mukherjee

20. Stereochemistry-E. Eliel & S. H. Wilen

21. Stereochemistry- D. Nasipuri

21a. Stereochemistry of Organic Compounds- P. Kalsi

22. NMR in Chemistry-A Multinuclear approach—W. Kemp

23. Application of N. M. R. Spectroscopy in Organic ChemistryL- L. M. Jackman M.

24. Interpretation of 13C –NMR Spectra- F. W. Werli & T. W. Wirthlin

25. Mass Spectrometry-Organic Applications-K. Biieman

26. Free Radicals in Organic Chemisrey—Fossey, Lepost & Sorbs

27. Elements of Organic Photochemistry-D. O. Cowan & K. L.Drisco

28. Application of Organotransition Metal in Organic Synthesis-S.G. Davies

29. Comprehensive Heterocyclic Chemistry- A. R. Katritzky, & C. W. Rees (eds)

30. Heterocyclic Chemistry-J. A. Joule &K. Mills

31. Natural Product-A. Pelter

32. Natural Products: Chemistry & Biological Significance Mann, Davidson, Hobbs, Banthrope, Harbome & Longman

33. An Introduction to Medicinal Chemistry-(3rd.edn) G. L. Patrick

34. Fundamentals of Medicinal Chemistry-G. Thomas

35. Supramolecular Chemistry: Concepts & Perspective- J. M. Lehn

36. Experimental Organic Chemistry: Principles & Practice-L. M. Harwood & C. J. Roodey

37. Experiments and Techniques in organic Chemistry-Pasto, Johnson & Miller

38. Spectrometric Identification of Organic Compounds-(6th. edn)-Silverstein & Webster

39. An Introduction to Experimental Organic Chemistry- Robert, Gilbert, Rodewaid & Wingrove

40. Systematic Qualitative Organic Analysis-H. Middleton

41. Hand Book of Organic Analysis- H. T. Clarke 42. Text Book of Practical Organic Chemistry-A.I. Vogel

42. Aromaticity & Aromatic character : G.M. Badger

Physical Chemistry Books

1. Physical Chemistry: A Molecular Approach-D. A. McQuarrie & J. D. Simon
2. Physical Chemistry- R. S. Berry, S. A. Rice & J. Ross
3. Introduction to Quantum mechanics- L. Pauling & E. B. Wilson
4. Quantum Mechanics J. L. Powel & B. Crasemann
5. Elementary Quantum Chemistry-F. L. Pilar
6. Quantum Chemistry- I. N. Levine
7. Chemical Kinetics-K. J. Laidler
8. Fundamentals of Chemical Kinetics-S. W. Benson
9. Theoretical Chemistry- S. Glasstone
10. The Principles of Chemical Equilibrium-K. Denbigh
11. The Physical Chemistry of Surfaces- N. K. Adams
12. Physical Chemistry of Surfaces- A. W. Adamson
13. Introduction to Molecular Spectroscopy-G. M. Barrow
14. Fundamentals of Molecular Spectroscopy- C.W. Banwell
15. Introduction to Quantum Mechanics- D. J. Griffith
16. Group Theory and Chemistry—D. M. Bishop
17. Thermodynamics and an Introduction to Thermostatistics- H. B. Callen
18. Coulson`s Valence- R. McWeeny
19. Modern Electrochemistry-J.O`M. Bockris & A. K. N. Reddy
20. Principles of Physical Biochemistry- K. E. van Holde, C. Johnson & P. S. Ho
21. Polymer chemistry-P. J. Flory
22. Microwave Spectroscopy-C. H. Townes & A. L. Schawlow
23. Symmetry and Spectroscopy- D. C. Harris & M. d. Bertolucci
24. Solid State Physics- A. J. Dekker
25. Introduction to Solid State Physics- C. Kittel
26. Chemical Kinetics and Dynamics- J. I. Seinfeld, J. S. Francesco & W. L. Hase

Physical Chemistry Books

1. Physical Chemistry: A Molecular Approach-D. A. McQuarrie & J. D. Simon
2. Physical Chemistry- R. S. Berry, S. A. Rice & J. Ross
3. Introduction to Quantum mechanics- L. Pauling & E. B. Wilson
4. Quantum Mechanics J. L. Powel & B. Crasemann
5. Elementary Quantum Chemistry-F. L. Pilar
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21. Polymer chemistry-P. J. Flory
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23. Symmetry and Spectroscopy- D. C. Harris & M. d. Bertolucci
24. Solid State Physics- A. J. Dekker
25. Introduction to Solid State Physics- C. Kittel
26. Chemical Kinetics and Dynamics- J. I. Seinfeld, J. S. Francesco & W. L. Hase

27. Text Book of Physical Chemistry- S. Glasstone

28. Statistical Mechanics- D. A. Mcquarrie

29. Statistical Mechanics-B. B. Laud

30. Statistical Mechanics- K. Huang

31. Practical Physical Chemistry- A. M. James & F. F. Prichard

32. Findlay's Practical Physical Chemistry- B. P. Levit

33. Experimental Physical Chemistry- Shoemaker & Garland

34. Introduction to Magnetic Resonance-A. Carrington & A. D. McLachlan

35. NMR, NQR, EPR and Mossbauer Spectro. in Inorganic Chemistry- R. V. Parish

36. Macromolecules:Structure and Function- F. Wold, Prentice-Hall

37. Principles of Biochemistry- A.L. Lehninger

38. Programming with FORTRAN - S. Lepschutz & A. Poe (Schaum Series)

39. Computer Programming in FORTRAN 77- V. Rajaraman

40. Computational Chemistry- A. C. Norris, John Wiley

41. Computational Chemistry- A. Konar

42. Computers in Chemistry – K. V. Raman, TMH

43. Electricity and Magnetism (Vol I) – J.H. Fewkes & J. Yarwood, OUP

44. Atomic Physics (Vol II) – J. Yarwood , OUP 45. Biochemistry – Voet and Voet

45. Kinetic & Mechanism. by Frost &
46. Statistical Mechanics : T.H. Hill,
47. N.M.R. : Raymond. C. Chang,

Computer applications in chemistry

Suggested Readings

1. Rajaraman V., Computer Progoramming in FORTRAN 90 and 95, 4th edition, Pubs:Prentice Hall, India (2004).

2. Scheid F., Numerical Analysis: Schaum's Series, Pubs: McGraw Hill, Singapore (1988)

Annexure-III

LIST OF EXPERTS & EXAMINERS IN CHEMISTRY

S.No.	Name of the Expert	Area of Interest	Position and Organization	Contact Information
1.	**Dr. Dinesh Mohan**	Environmental Chemistry, Analytical Chemistry, Physical Chemistry	School of Environmental Sciences Jawaharlal Nehru University New Delhi - 110067	+91-11- 26704305 dmohan@mail.jnu.ac.in dm_1967@hotmail.com
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