



### List of Revised Courses

Department : **Chemistry**

Programme Name : **M.Sc.**

Academic Year : **2020-21**

### **List of Revised Courses**

Sr. No.	Course Code	Name of the Course
01.	CMT-304 (P)	Quantum Chemistry



## Minutes of Meetings (MoM) of Board of Studies (BoS)

**Academic Year : 2020-21**

**School : School of Physical Sciences**

**Department : Chemistry**

**Date and Time : Sept. 04, 2020 - 12:00 noon**

**Venue : Meeting room**

The scheduled meeting of member of Board of Studies (BoS) of Department of Chemistry, School of Studies of Physical Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the contents of each paper of U.G (CBCS) program and continuing elective course system (ECS) since 2009, P.G. program by members (both internal and external).

The following members were present in the meeting:

1. Prof. A. Mittal (External Expert Member BoS, Dept. of Chemistry, MNIT Bhopal)
2. Prof. G. K. Patra (Member BoS, Dept. of Chemistry, GGV.)
3. Prof. Tanmay Kumar Ghorai (HOD, Dept. of Chemistry-cum Chairman, BOS)
4. Dr. S. K. Singh (Member BoS, Associate Professor, Dept. of Chemistry)
5. Dr. S. Banerjee (Member, Assistant Professor, Dept. of Chemistry)

Following points were discussed during the meeting

1. The syllabus of Chemistry Generic Elective was thoroughly modified.
2. The content of existing Quantum Mechanics Paper [CMT-304(P)] of M.Sc. III Semester Physical Chemistry special was also modified on request of the teachers of Physical Chemistry Special.

The committee discussed and approved the scheme and syllabi. The following courses were revised in the B. Sc. (I, II, III and IV Semesters) and M. Sc. III Semesters:

- ❖ PSCHGE0101L Generic Elective - I
- ❖ PSCHGE0101P Generic Elective - I Practical
- ❖ PSCHGE0202L Generic Elective - 2
- ❖ PSCHGE0202P Generic Elective - 2 Practical
- ❖ PSCHGE0303L Generic Elective - 3
- ❖ PSCHGE0303P Generic Elective - 3 Practical
- ❖ PSCHGE0404L Generic Elective - 4
- ❖ PSCHGE0404P Generic Elective - 4 Practical
- ❖ CMT-304 (P) Quantum Chemistry

**अध्यक्ष/Head**

**रसायन शास्त्र विभाग**

**Dept. of Chemistry**

**गुरु घासीदास विश्वविद्यालय,**  
**Guru Ghasidas Vishwavidyalaya,**  
**बिलासपुर 495009 (छ.ग.)**  
**Bilaspur 495009 (C.G.)**



## Scheme and Syllabus

### Annexure-II

Revised

CMT-304 (P): Quantum Chemistry Credits: 3

- Fundamentals of Quantum Chemistry:** General formulation of Quantum Mechanics: Eigen functions and Eigen values and quantum mechanical operators, Expectation value of a physical quantity. Orthogonalization and normalization of wave functions. Postulates and theorem of quantum mechanics.
- Solutions to Schrodinger Equation:** Schrodinger wave equation, solution of Schrodinger wave equation to some model systems viz. particle in a box, rigid rotor, harmonic oscillator and H atom problems.
- Approximation Methods in Quantum Chemistry:** Variation method, Stationary perturbation theory for non-degenerate and degenerate. Ground state of He atom. Time-dependent perturbation theory. Radiative transition, Einstein coefficients.
- Angular momentum:** Ordinary Angular momentum, generalized angular momentum, eigen functions for angular momentum, Eigen values of Angular momentum, operators, ladder operator, Addition of angular momenta.
- Many Electron atoms:** Antisymmetry and Pauli Exclusion Principle, Term symbols for two equivalent electrons, Total angular momentum and spin-orbit interaction. Condon Slater Rules.

#### Books Recommended

- P.W. Atkins and R.S. Friedman, Molecular Quantum Mechanics, 3rd edition (1997), Oxford University Press. Oxford.
- H. Eyring, J. Walter and G.E. Kimball, Quantum Chemistry, John Wiley, New York (1944)
- I.N. Levine, Quantum Chemistry, 5th edition (2000), Pearson Educ., Inc., New Delhi.
- G. M. Barrow, Physical Chemistry, Fifth edition, Tata MacGraw Hill, New delhi (1994).
- J. N. Gurtu and A. Gurtu, Advanced Physical Chemistry, Pragati Edition, Meerut (2009).
- Donald A. McQuarrie, Quantum Chemistry, published by Viva Books PVT LTD, New Delhi (2007)