

# Department of Chemistry

## COURSE STRUCTURE (Minimum Core/Electives Credits = 56/40)

### FIRST SEMESTER (ODD SEMESTER)

Code No.	Title	Theory/Practical (Hrs/Week)	Total Marks	Credits
MSCHE1001C04	Group Theory, Bonding and Metal-Ligand Equilibrium	4	100	4
MSCHE1002C04	Bonding, Stereochemistry and Reaction Mechanism (I)	4	100	4
MSCHE1003C04	Basic Concepts of Physical Chemistry	4	100	4
MSCHE1004C04	Inorganic Chemistry Lab	8	100	4
Departmental Elective	One or more courses to be selected from the elective basket for odd semesters	4	100	4
Open Elective (Inter-School or Inter-Department or SWAYAM)	One or more courses to be selected from the elective basket for odd semester	4	100	4

### SECOND SEMESTER (EVEN SEMESTER)

Code No.	Title	Theory/Practical (Hrs/Week)	Total Marks	Credits
MSCHE2001C04	Photochemical and magnetic properties of complexes and nuclear chemistry	4	100	4
MSCHE2002C04	Reaction Mechanism (II), Pericyclic and Photochemical Reactions	4	100	4
MSCHE2003C04	Quantum Mechanics and Statistical Thermodynamics	4	100	4
MSCHE2004C04	Physical Chemistry Lab	8	100	4
Departmental Elective	Two or more courses to be selected from the elective basket for even semesters	4	100	4

### THIRD SEMESTER (ODD SEMESTER)

Code No.	Title	Theory/Practical (Hrs/Week)	Total Marks	Credits
MSCHE3001C04	Carbohydrates, Hetrocyclic Compounds, Organometallic Reagents and Synthetic	4	100	4
MSCHE3002C04	Project-I and Scientific Activities	-	100	2+ 2 = 4
MSCHE3003C04	Organic Chemistry Lab	8	100	4
<b>Departmental Elective</b>	<b>Two</b> or more courses to be selected from the elective basket for odd semesters	4	100	4
<b>Open Elective (Inter-School or Inter-Department or SWAYAM)</b>	<b>One</b> or more courses to be selected from the elective basket for odd	4	100	4

### FOURTH SEMESTER (EVEN SEMESTER)

(Common to students of all branches)

Code No.	Title	Theory/Practical (Hrs/Week)	Total Marks	Credits
<b>Chemistry Specialisation</b>				
MSCHE4001C12	Project-II	-	100	12
<b>Departmental Elective</b>	<b>Three</b> or more courses to be selected from the elective basket for even semesters	4	100	4

### ELECTIVES COURSES

(Minimum 40 Credits<sup>#</sup>)

Code No.	Title of the Paper	Teaching/contact Hrs/week	Total Marks	Credits
<b>Elective-Basket for 1<sup>st</sup> Semester (Odd Semester)</b>				
<ul style="list-style-type: none"> <li>At least one elective has to be chosen.</li> </ul>				
MSCHE1001E04	Supramolecular Chemistry	4	100	4
MSCHE1002E04	Chemistry of Biomolecules	4	100	4
MSCHE1003E04	Green Chemistry I: Solvents & Synthesis	4	100	4
<b>SWAYAM Elective*</b>				
<sup>#</sup> Few courses have to be taken from SWAYAM portal and from other schools/departments Students will also be encouraged to take a self study/skill-based course available on SWAYAM portal. No credit will be awarded for this as it would be a zero-credit course. * SWAYAM Courses will be reviewed and announced by the department periodically.				
<b>Elective-Basket for 2<sup>nd</sup> Semester (Even Semester)</b>				
<ul style="list-style-type: none"> <li>At least two electives have to be chosen.</li> </ul>				
MSCHE2001E04	Solid State and Structural Chemistry	4	100	4
MSCHE2002E04	Advanced Instrumental Techniques-I	4	100	4

<b>MSCHE2003E04</b>	Green Chemistry II: Catalysis	4	100	4
<b>MSCHE2004E04</b>	Nucleoside, Advances in Nucleic Acid and Proteins	4	100	4
<b>MSCHE2005E04</b>	Chemistry of Natural Products	4	100	4
<b>Elective-Basket for 3<sup>rd</sup> Semester (Odd Semester)</b>				
<b>• At least two electives have to be chosen.</b>				
<b>MSCHE3001E04</b>	Atom Dynamics in Solid and Advanced Magnetochemistry	4	100	4
<b>MSCHE3002E04</b>	Surface Phenomena, Chemical Dynamics and Spectroscopy	4	100	4
<b>MSCHE3003E04</b>	Chemistry of Materials	4	100	4
<b>MSCHE3004E04</b>	Advanced Photochemistry	4	100	4
<b>MSCHE3005E04</b>	Medicine and Agrochemicals	4	100	4
<b>MSCHE3006E04</b>	Nano Chemistry	4	100	4
<b>Elective-Basket for 4<sup>th</sup> Semester (Even Semester)</b>				
<b>• At least three electives have to be chosen.</b>				
<b>MSCHE4001E04</b>	Reaction mechanism, Organometallics and Advanced Bioinorganic Chemistry	4	100	4
<b>MSCHE4002E04</b>	Applications of spectroscopy techniques to inorganic systems	4	100	4
<b>MSCHE4003E04</b>	Advanced Inorganic Materials	3 (L)+2 (P) = 5	100	3+1 = 4
<b>MSCHE4004E04</b>	Dynamic Stereochemistry, reagents and Retrosynthetic analysis	4	100	4
<b>MSCHE4005E04</b>	Medicinal, combinatorial and Organometallic reagents in Organic synthesis	4	100	4
<b>MSCHE4006E04</b>	Spectroscopy and catalysis in Organic synthesis	3 (L)+2 (P) = 5	100	3+1 = 4
<b>MSCHE4007E04</b>	Advanced Quantum Mechanics and Surface Chemistry	4	100	4
<b>MSCHE4008E04</b>	Applied Electrochemistry	4	100	4
<b>MSCHE4009E04</b>	Lasers in Chemistry	4	100	4
<b>MSCHE4010E04</b>	Green Energy Systems	4	100	4
<b>MSCHE4011E04</b>	Advanced Instrumental Techniques-II	4	100	4