

**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,  
AURANGABAD.**

**DEPARTMENT OF CHEMISTRY**



# **SYLLABUS**

**M. Sc. Chemistry**  
**(Semester I to IV)**

**Choice Based Credit and Grading System**

**Effective from : June 2016**



## **Structure and Curriculum for M. Sc. Chemistry programme (Choice Based Credit and Grading System)**

The M. Sc. Chemistry programme is divided into four semesters having 108 credits. There are 19 theory courses of 63 credits, 09 laboratory courses of 27 credits, research project of 18 credits (distributed in IV semester) and one course is on constitution of India is of 02 credit. Tutorials, assignments and seminar presentation are integral component of all theory courses. Approximately, 44% are of core courses, 4% foundation courses, and 7% are elective courses, 25% laboratory courses and 20% research project.

### **Eligibility:**

Those who have completed B. Sc. with Chemistry as an optional subject from any recognized University/ Institution are eligible for registration subject to the rules and regulations laid down by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

### **Admission / Promotion Process:**

In response to the advertisement for registration, interested students will have to register themselves. Admission will be done on the basis of Common Entrance Test (CET) (50% weightage) and performance of students at their qualifying graduate level examination (50% weightage of Marks obtained in the subject of Chemistry at B. Sc level). Once the student is admitted he/she will be promoted to the 2<sup>nd</sup> year (3<sup>rd</sup> semester) as per university rules and regulations. The admission of the concern student will be automatically cancelled if he / she fails to complete the M. Sc. degree within a period of maximum four years / eight semesters.

### **Choice Based Credit System (CBCS) :**

The choice based credit system has been adopted by this department. This provides flexibility to make the system more responsive to the changing needs of our students, the professionals and society. It gives greater freedom to students to determine their own pace of study. The credit based system also facilitates the transfer of credits.

### **Credit-to- contact hour Mapping:**

One contact hour per week is assigned 1 credit for theory and 0.5 credits for laboratory courses/ research project. Thus a 4- credit theory course corresponds to 4 contact hours per week and same analogy will be applicable for laboratory courses / research project.



<b>Semester- I (Core and Foundation Courses)</b>				
<b>Paper No.</b>	<b>Course Title</b>	<b>Teaching (hrs/week)</b>	<b>Marks</b>	<b>Credits</b>
CHEC-101	Inorganic chemistry	04	100	04
CHEC-102	Organic chemistry	04	100	04
CHEC-103	Physical chemistry	04	100	04
CHEF-104	Analytical chemistry	02	50	02
COM-100	Constitution of India	02	50	02
CHELI-105	Laboratory course	06	50	03
CHELO-106	Laboratory course	06	50	03
CHELP-107	Laboratory course	06	50	03
<b>Total Credits for Semester I: 25 (Theory: 16; Laboratory: 09)</b>				

<b>Semester- II (Core and Foundation Courses)</b>				
<b>Paper No.</b>	<b>Course Title</b>	<b>Teaching (hrs/week)</b>	<b>Marks</b>	<b>Credits</b>
CHEC-201	Inorganic chemistry	04	100	04
CHEC-202	Organic chemistry	04	100	04
CHEC-203	Physical chemistry	04	100	04
CHEF-204	Analytical chemistry	02	50	02
CHEF-205	Research methodology	02	50	02
CHER-206	Review of literature	01	25	01
CHELI-207	Laboratory course	06	50	03
CHELO-208	Laboratory course	06	50	03
CHELP-209	Laboratory course	06	50	03
<b>Total Credits for Semester II: 26 (Theory: 17; Laboratory: 09)</b>				

<b>Semester- III (Core and Elective Courses) Inorganic Chemistry</b>				
<b>Paper No.</b>	<b>Course Title</b>	<b>Teaching hrs/week</b>	<b>Marks</b>	<b>Credits</b>
CHESC-301	Structural elucidation by spectral methods	04	100	04
CHECI-302	Bioinorganic and supramolecular chemistry	04	100	04
CHECI-303	Applied inorganic chemistry	04	100	04
CHEEI-304	Chemistry of materials <b>OR</b>	04	100	04
CHEEI-305	Environmental chemistry <b>OR</b>	04	100	04
CHEEI-306	Solid state chemistry	04	100	04
CHELI-307	Laboratory course	06	50	03
CHELI-308	Laboratory course	06	50	03
CHELI-309	Laboratory course	06	50	03
<b>Total Credits for Semester III: 25 (Theory: 16; Laboratory: 09)</b>				





Semester- III (Core and Elective Courses) Organic Chemistry				
Paper No.	Course Title	Teaching hrs/week	Marks	Credits
CHEOC-301	Structural elucidation by spectral methods	04	100	04
CHEOC-302	Organic synthesis	04	100	04
CHEOC-303	Pericyclic reactions, photochemistry and free radicals	04	100	04
CHEEO-304	Advanced organic chemistry OR	04	100	04
CHEEO-305	Environmental chemistry OR	04	100	04
CHEEO-306	Green chemistry	04	100	04
CHELO-307	Laboratory course	06	50	03
CHELO-308	Laboratory course	06	50	03
CHELO-309	Laboratory course	06	50	03
<b>Total Credits for Semester III: 25 (Theory: 16; Laboratory: 09)</b>				

Semester- III (Core and Elective Courses) Physical Chemistry				
Paper No.	Course Title	Teaching hrs/week	Marks	Credits
CHEOC-301	Structural elucidation by spectral methods	04	100	04
CHECP-302	Solid state chemistry	04	100	04
CHECP-303	Thermodynamics	04	100	04
CHEEP-304	Advanced electrochemistry OR	04	100	04
CHEEP-305	Nuclear chemistry OR	04	100	04
CHEEP-306	Environmental chemistry	04	100	04
CHELP-307	Laboratory course	06	50	03
CHELP-308	Laboratory course	06	50	03
CHELP-309	Laboratory course	06	50	03
<b>Total Credits for Semester III: 25 (Theory: 16; Laboratory: 09)</b>				

Semester- IV (Core and Elective Courses) Inorganic Chemistry				
Paper No.	Course Title	Teaching hrs/week	Marks	Credits
CHECI-401	Nuclear chemistry	02	50	02
CHECI-402	Photoinorganic chemistry	04	100	04
CHECI-403	Therapeutic bioinorganic and forensic chemistry	04	100	04
CHEEI-404	Organo transition metal chemistry OR	04	100	04
CHEEI-405	Polymer chemistry OR	04	100	04
CHEEI-406	Theoretical and structural inorganic chemistry	04	100	04
CHEIR-407	Research project (Experimental)	24	200	12
CHEIR-408	Research project (Dissertation, presentation and Seminars)	06	100	06
<b>Total Credits for Semester IV: 32 (Theory: 14; Laboratory: 18)</b>				





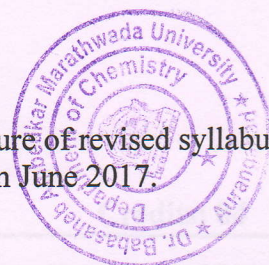
Semester- IV (Core and Elective Courses) Organic Chemistry				
Paper No.	Course Title	Teaching hrs/week	Marks	Credits
CHECO-401	Heterocyclic chemistry	02	50	02
CHECO-402	Organic synthesis: Retrosynthetic approach	04	100	04
CHECO-403	Chemistry of natural products	04	100	04
CHEEO-404	Medicinal chemistry OR	04	100	04
CHEEO-405	Organic high polymers OR	04	100	04
CHEEO-406	Drug design and drug discovery	04	100	04
CHEOR-407	Research project (Experimental)	24	200	12
CHEOR-408	Research project (Dissertation, presentation and Seminars)	06	100	06
<b>Total Credits for Semester IV: 32 (Theory: 14; Laboratory: 18)</b>				

Semester- IV (Core and Elective Courses) Physical Chemistry				
Paper No.	Course Title	Teaching hrs/week	Marks	Credits
CHECP-401	Surface and magnetochemistry	02	50	02
CHECP-402	Polymer chemistry	04	100	04
CHECP-403	Chemical dynamics and catalysis	04	100	04
CHEEP-404	Nanochemistry OR	04	100	04
CHEEP-405	Quantum chemistry OR	04	100	04
CHEEP-406	Biophysical chemistry	04	100	04
CHEPR-407	Research Project-3(Experimental)	24	100	12
CHEPR-408	Research project (Dissertation, presentation and Seminars)	06	50	06
<b>Total Credits for Semester IV: 32 (Theory: 14; Laboratory: 18)</b>				





The following will be the Choice Based Credit and Grading System structure of revised syllabus for M. Sc. III & IV semester Analytical Chemistry effective from June 2017.



Semester	Paper Nos.	Title of Paper	Teaching (Hrs.)/week	Marks	Credits
III- Semester	CHESC-301	Structural elucidation by spectral methods	04	100	04
	CHECA- 302	Advanced Analytical Techniques-I	04	100	04
	CHECA- 303	Quality Assurance and Accreditation	04	100	04
	CHEEA -304	Electroanalytical TechniquesOR	04	100	04
	CHEEA -305	Advanced Analytical Techniques-II OR	04	100	04
	CHEEA- 306	Polymer & Petrochemical Analysis	04	100	04
	CHELA- 307	Laboratory course	06	50	03
	CHELA- 308	Laboratory course	06	50	03
	CHELA- 309	Laboratory course	06	50	03
IV semester	CHECA -401	Analytical Method Development and Validation	02	50	02
	CHECA -402	Pharmaceutical, and Forensic Analysis	04	100	04
	CHECA -403	Environmental Analysis and Monitoring	04	100	04
	CHEEA -404	Food, Fertilizer & Pesticides AnalysisOR	04	100	04
	CHEEA -405	Ores, Alloys & CosmeticsAnalysis OR	04	100	04
	CHEEA -406	Microbial and Clinical Analysis	04	100	04
	CHEAR - 407	Research project (Experimental)	24	200	12
	CHEAR - 408	Research project (Dissertation, Presentation and Seminars)	06	100	06