# Mangalore University

# Department of Studies in Chemistry

## M. Sc. Degree Programmes

**(CHOICE BASED CREDIT SYSTEM – SEMESTER SCHEME)**

**Syllabi for M.Sc., Courses in**

# CHEMISTRY

(From the Academic Year 2016-17 onwards)

# Mangalore University

## M. Sc. Degree Programme in Chemistry:

### CHOICE BASED CREDIT SYSTEM (CBCS) SEMESTER SCHEME

### C O U R S E P A T T E R N AND S C H E M E OF E X A M I N A T I O N

(Year 2016-2017 onwards)

### PREAMBLE

Revision of Syllabi for the Two years Master Degree (Choice Based Credit System-Semester Scheme) Pogrammes in Chemistry, Applied Chemistry, Organic Chemistry and Analytical Chemistry.

PG BOS in Chemistry has revised and prepared the Syllabi (CBCS based) for all the Four Courses -Chemistry, Applied Chemistry, Organic Chemistry and Analytical Chemistry in its meeting held on 24$^{th}$ July 2014 and the University implemented it from the same academic year. Now the University has asked the PG BOS in Chemistry to revise the syllabi by giving certain Guidelines (Ref:-No: MU/ACC/CR.38/ CBCS (PG)/2015-16 dt.05-05-2016 bse on UGC letter) for all the four Courses (Programmes) to offer Hard Core, Soft Core and Open Elective courses with credits to each course amounting to 92 credits for the entire programme.

Accordingly, the PG BOS in Chemistry prepared the syllabi for all the four programmes. It has prepared course pattern by proposing 12 Hard Core theory courses (3 in each semester) and 5 practical courses (in 3$^{rd}$ and 4$^{th}$ semester), one Project work (in 4$^{th}$ Semester with 4 credits)with a provision to have One Project Work in lieu of one of the practicals in 4$^{th}$ semester in each programme with 3 credits each(project work - 4 credits) with total of **55 Credits**). BOS is offering 3, 2, 2 and 3 (Total 10 courses) Soft core courses respectively in 1$^{st}$ , 2$^{nd}$, 3$^{rd}$ and 4$^{th}$ semesters of a programme. Student shall opt any 2, 1, 1 and 2(Total 6 courses) courses respectively in 1$^{st}$ , 2$^{nd}$ , 3 $^{rd}$, 4$^{th}$ Semesters. All the soft core courses are of 3 credits. Programme consists of 6 Soft Core practical courses (3 courses each in 1$^{st}$ and 2$^{nd}$ semesters of the Programme with 2 credits each) with a total of **30 credits** (6 theory x 3 credits + 6 practicals x 2 credits). BOS has also proposed 2 open electives (1 each in 2$^{nd}$& 3$^{rd}$ Semesters of the programme) with 3 credits each (**6 credits)**. All together **total credits** come to 91from teaching. I have prepared a draft course pattern by considering all the points mentioned in the above said letter from the Registrar and placing it before the BOS meeting.

Detailed syllabi for 1$^{st}$ and 2$^{nd}$ Semesters are prepared and enclosed, whereas the syllabi for the 3$^{rd}$ and 4$^{th}$ Semesters will be prepared in forthcoming BOS meeting.

## Course/credit pattern:

| Semester Credits | Hard Core(H)(T) | Soft Core (S)(T) | Elective E)(T) | Practical | Tutorial | Total Credits |
|---|---|---|---|---|---|---|
| First | 9 | 6 | -- | 6 (S) | -- | 21 |
| Second | 9 | 3 | 3 | 6 (S) | -- | 21 |
| Third | 9 | 3 | 3 | 9 (H) | -- | 24 |
| Fourth | 9 | 6 | -- | 10(H) | -- | 25 |
| Total | 36 | 18 | 6* | 12(S) + 19(H) | -- | 91 |

Total Credits from all the Four Semesters (1st , 2nd , 3rd and 4th) : 21+21+24+25 = 91

Total Hard Core credits = 36 (T) + 19 (P) = 55 = 60.4%

Total Soft Core credits = 18 (T) + 12(P) = 30 = 33.0%

*Open Elective Credits = 6 = 6.6% (Not to considered for calculating the CGPA) H= Hard Core, S= Soft Core, P =Practical/Project

**Consolidated Course code and title**
**Programme: M.Sc. in Chemistry**

**1st Semester** **2nd Semester**

| Course Code | Course Title | Course Code | Course Title |
|---|---|---|---|
| CH H 401 | Inorganic Chemistry | CH H 451 | Advanced Inorganic Chemistry |
| CH H 402 | Organic Chemistry | CH H 452 | Advanced Organic Chemistry |
| CH H 403 | Physical Chemistry | CH H 453 | Advanced Physical Chemistry |
| CH S 404<br>Or<br>CH S 405 | Inorganic Spectroscopy and Analytical Techniques<br>Or<br>Environmental Chemistry | CH S 454<br>Or<br>CH S 455 | Organic Spectroscopic Techniques Or<br>Chemistry of Bio-molecules |
| CH S 406 | Molecular Spectroscopy and Diffraction Techniques | CH E 456 | Environmental, Electro- and Polymer Chemistry |
| CH P 407 | Inorganic Chemistry Practicals-1 | CH P 457 | Inorganic Chemistry Practicals-II |
| CH P 408 | Organic Chemistry Practicals-1 | CH P 458 | Organic Chemistry Practicals-II |
| CH P 409 | Physical Chemistry Practicals-1 | CH P 459 | Physical Chemistry Practicals-II |

**3rd Semester** **4th Semester**

| | | | |
|---|---|---|---|
| CH H 501 | Coordination Chemistry | CH H 551 | Bioinorganic Chemistry |
| CH H 502 | Organic Reaction Mechanism and Heterocyclic Chemistry | CH H 552 | Organic Synthetic Methods |
| CH H 503 | Solid State Chemistry | CH H 553 | Electrochemistry and Reaction Dynamics |
| CH S 504<br>Or<br>CH S 505 | Medicinal & Natural Product Chemistry<br>Or<br>Bioorganic Chemistry | CH S 554 | Organometallic Chemistry |
| CH E 506 | Analytical and Green Chemistry | CH S 555<br>Or<br>CH S 556 | Polymer Chemistry<br>Or<br>Nuclear, Radiation & Photochemistry |
| CH P 507 | Inorganic Chemistry Practicals-III | CH P 557 | Inorganic Chemistry Practicals-IV |
| CH P 508 | Organic Chemistry Practicals-III | CH P 558 | Physical Chemistry Practicals-IV |
| CH P 509 | Physical Chemistry Practicals-III | CH P 559 | Project Work & Dissertation |

## Detailed distribution of Course &Credits:

Programme: **Chemistry:**

### 1st Semester

| Course Code | Course Title | No of UNITs | Evaluation IA + Exam | Teaching hr week | Sem | Exam Hrs | Credits |
|---|---|---|---|---|---|---|---|
| CH H 401 | Inorganic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 402 | Organic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 403 | Physical Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH S 404<br>Or<br><br>CH S 405 | Inorganic Spectroscopy and Analytical Techniques<br>Or<br>Environmental Chemistry | 3<br><br><br>3 | 30 + 70<br><br><br>30 + 70 | 3<br><br><br>3 | 36<br><br><br>36 | 3 | 3 |
| CH S 406 | Molecular Spectroscopy and Diffraction Techniques | 3 | 30 + 70 | 3 | 36 | 3 | 3 |
| CH P 407 | Inorganic Chemistry Practicals-1 | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |
| CH P 408 | Organic Chemistry Practicals-1 | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |
| CH P 409 | Physical Chemistry Practicals-1 | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |

Total credits from 1St Semester**: 21** (Hard Core-9, Soft Core-12)

### 2nd Semester

| Course Code | Course Title | No of UNITs | Evaluation IA+ Exam | Teaching hr week | Sem | Exam Hrs | Credits |
|---|---|---|---|---|---|---|---|
| CH H 451 | Advanced Inorganic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 452 | Advanced Organic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 453 | Advanced Physical Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH S 454<br>Or<br><br>CH S 455 | Organic Spectroscopic Techniques<br>Or<br>Chemistry of Bio-molecules | 3<br><br><br>3 | 30+70<br><br><br>30 + 70 | 3<br><br><br>3 | 36<br><br><br>36 | 3 | 3 |
| CH E 456 | Environmental, Electro- and Surface Chemistry | 3 | 30 + 70 | 3 | 36 | 3 | 3 |
| CH P 457 | Inorganic Chemistry Practicals-II | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |
| CH P 458 | Organic Chemistry Practicals-II | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |
| CH P 459 | Physical Chemistry Practicals-II | 4 Hrs | 30 + 70 | 4 | | 4 | 2 |

## 3rd Semester

| Course Code | Course Title | No of UNITs | Evaluation IA +Exam | Teaching hr week | Sem | Exam Hrs | Credits |
|---|---|---|---|---|---|---|---|
| CH H 501 | Coordination Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 502 | Organic Reaction Mechanism and Heterocyclic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 503 | Solid State Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH S 504<br>Or<br><br>CH S 505 | Medicinal & Natural Product Chemistry<br>Or<br>Bioorganic Chemistry | 3<br><br>3 | 30 + 70<br><br>30 + 70 | 3<br><br>3 | 36<br><br>36 | 3 | 3 |
| CH E 506 | Analytical & Green Chemistry | 3 | 30 + 70 | 3 | 36 | 3 | 3 |
| CH P 507 | Inorganic Chemistry Practicals-III | 6 Hrs | 30 + 70 | 6 | | 6 | 3 |
| CH P 508 | Organic Chemistry Practicals-III | 6 Hrs | 30 + 70 | 6 | | 6 | 3 |
| CH P 509 | Physical Chemistry Practicals-III | 6 Hrs | 30 + 70 | 6 | | 6 | 3 |

Total Credits = **24** (Hard Core-18, Soft Core-3 and Elective-3)

## 4th Semester

| Course Code | Course Title | No of UNITs | Evaluation IA + Exam | Teaching hr week | Sem | Exam hrs | Credits |
|---|---|---|---|---|---|---|---|
| CH H 551 | Bioinorganic Chemistry | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 552 | Organic Synthetic Methods | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH H 553 | Electrochemistry and Reaction Dynamics | 3 | 30 + 70 | 3 | 45 | 3 | 3 |
| CH S 554 | Organ metallic Chemistry | 3 | 30 + 70 | 3 | 36 | 3 | 3 |
| CH S 555<br>Or<br>CH S 556 | Polymer Chemistry<br>Or<br>Nuclear, Radiation & Photochemistry | 3<br><br>3 | 30 + 70<br><br>30 + 70 | 3<br><br>3 | 36<br><br>36 | 3 | 3 |
| CH P 557 | Inorganic Chemistry Practicals -IV | 6 Hrs | 30 + 70 | 6 | | 6 | 3 |
| CH P 558 | Physical Chemistry Practicals -IV | 6 Hrs | 30 + 70 | 6 | | 6 | 3 |
| CH P 559 | Project Work & Dissertation | 8 Hrs | 30 + 70 | 8 | | -- | 4 |

Total Credits = **25** (Hard Core-18, Soft Core-6 + Seminar- 1)

**Total Credits: 21+21+24+25 = 91.**