KAVAYITRI BAHINABAI CHAUDHARI
NORTH MAHARASHTRA UNIVERSITY,
JALGAON

# Academic Curriculum
## (For Affiliated Colleges of KBCNMU)

# MASTER OF SCIENCE
# In
# ORGANIC CHEMISTRY
# PART- II

## (Semester III and IV)

**Choice Based Credit System, 60:40 Pattern**
**(Outcome Based Curriculum)**

**As per UGC Guidelines**

**w. e. f. 2022-23**

**2022**

# KAVAYITRI BAHINABAI CHAUDHARI
# NORTH MAHARASHTRA UNIVERSITY, JALGAON

## Summary of Distribution of Credits under CBCS Scheme
## for
## M.Sc. Organic Chemistry
## at

**[Affiliated Colleges of Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon w.e.f. 2022-23]**

| Sr. No | Type of course | Sem I | Sem II | Sem III | Sem IV |
|---|---|---|---|---|---|
| 01 | Core | **12** | **12** | **12** | **08** |
| 02 | Core Skill based | **02** | **20** | **-** | **12** |
| 03 | Elective | **-** | **-** | **04** | **04** |
| 04 | Project | **-** | **-** | **-** | **06** |
| 05 | Audit | **02** | **02** | **02** | **02** |
| 06 | Total Credits | **16** | **34** | **18** | **32** |

| Subject Type | Core | Core Skill based | Elective | Project | Audit | Total |
|---|---|---|---|---|---|---|
| **Credits** | **44** | **34** | **08** | **06** | **08** | **100** |

**Total Credits = 100**

# Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

## M. Sc. Part-II Organic Chemistry (Sem-III and IV)
### Choice Based Credit System (Outcome Based Curriculum)
### [At Affiliated Colleges w.e.f. 2022-23]

### *Course credit scheme*

| Semester | (A) Core Courses | | | (B) Skill Based / Elective Course | | | (C) Audit Course (No weightage in CGPA) | | | Total Credits (A+B+C) |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Courses | Credits (T) | Total Credits | No. of Courses | Credits (T+P) | Total Credits | No. of Courses | Credits (Practical) | Total Credits | |
| I | 3 | 12 | **12** | 1 | 2 + 0 | 02 | 1 | 2 | 2 | **16** |
| II | 3 | 12 | **12** | 4 | 2 + 18 | 20 | 1 | 2 | 2 | **34** |
| III | 3 | 12 | **12** | 1 | 4 + 0 | 04 | 1 | 2 | 2 | **18** |
| IV | 2 | 08 | **08** | 4 | 4 + 18 | 22 | 1 | 2 | 2 | **32** |
| Total Credits | **44** | | | **48** | | | **8** | | | **100** |

(T, Theory; P, Practical)

### *Structure of Curriculum*

| | | First Year | | | | Second Year | | | | Total Credit Value |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Semester I | | Semester II | | Semester III | | Semester IV | | |
| | | Credit | Course | Credit | Course | Credit | Course | Credit | Course | |
| | **Prerequisite and Core Courses** | | | | | | | | | |
| **(A)** | Theory | 14 | 4 | 14 | 4 | 12 | 3 | 08 | 2 | 48 |
| | Practical | - | - | 18 | 3 | - | - | 18 | 3 | 36 |
| **(B)** | **Skill Based / Subject Elective Courses** | | | | | | | | | |
| 1 | Theory /Practical | - | - | - | - | 4 | 1 | 4 | 1 | 08 |
| **(C)** | **Audit Course (No weightage in CGPA calculations)** | | | | | | | | | |
| 1 | Practicing Cleanliness | 2 | 1 | | | | | | | 2 |
| 2 | Personality and Cultural Development Related Course | | | 2 | 1 | | | | | 2 |
| 3 | Technology Related + Value Added Course | | | | | 2 | 1 | | | 2 |
| 4 | Professional and Social + Value Added Course | | | | | | | 2 | 1 | 2 |
| | Total Credit Value | 16 | 5 | 34 | 8 | 18 | 5 | 32 | 7 | 100 |

| *List of Audit Courses (Select any ONE course of Choice from Semester II; Semester III and Semester IV)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Semester I (Compulsory)** | | **Semester II** (Choose One) | | **Semester III** (Choose One) | | **Semester IV**(Choose One) | |
| | | **Personality and Cultural Development** | | **Technology + Value Added Course** | | **Professional and Social + Value Added Course** | |
| **Course Code** | **Course Title** | **Course Code** | **Course Title** | **Course Code** | **Course Title** | **Course Code** | **Course Title** |
| AC-101 | Practicing Cleanliness | AC-201A | Soft Skills | AC-301A | Computer Skills | AC-401A | Human Rights |
| | | AC-201B | Practicing Sport Activities | AC-301B | Cyber Security | AC-401B | Seminar on Review of Research Paper |
| | | AC-201C | Practicing Yoga | AC-301C | Molecular Docking | AC-401C | Current Affairs |
| | | AC-201D | Introduction to Indian Music | AC-301D | Technical Report Writing | AC-401D | Intellectual Property Rights (IPR) |

# Kavayitri Bahinabai Chaudhari North Maharashtra University Jalgaon

## M. Sc. Part-II Organic Chemistry (Sem-III and IV)

### Choice Based Credit System (Outcome Based Curriculum)

### Semester-III

| Course Code | Course Type | Title of the Course | Contact hours/week | | | Distribution of Marks for Examination | | | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Internal | | External | | Total | | |
| | | | Th | Pr | Total | Th | Pr | Th | Pr | Th | Pr | |
| CH-350 | Core | Organic Reaction Mechanism | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | 04 |
| CH-351 | Core | Spectroscopic Methods in Structure Determination | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | 04 |
| CH-352 | Core | Organic Stereo Chemistry | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | 04 |
| CH-353 | Elective | Choose one out of two CH-353 A/B (A) Heterocyclic Chemistry (B) Green Chemistry | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | 04 |
| AC-301 (A)/ (B)/(C)/(D) | Audit Course | Choose one out of four (AC-301 A/B/C/D) (Technology + Value Added Course) | 02 | -- | 02 | 100 | -- | -- | -- | 100 | -- | 02 |

**List of Audit courses to be offered in Semester-III:**

**AC-301 (A): Computer Skills** **AC-301 (B): Cyber Security**

**AC-301 (C): Molecular Docking** **AC-301 (D): Technical Report Writing**

### Semester-IV

| Course Code | Course Type | Title of the Course | Contact hours/week | | | Distribution of Marks for Examination | | | | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Internal | | External | | Total | | |
| | | | Th | Pr | Total | Th | Pr | Th | Pr | Th | Pr | |
| CH-450 | Core | Chemistry of Natural Products | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | **04** |
| CH-451 | Core | Synthetic Methods in Organic Chemistry | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | **04** |
| CH-452 | Elective | Choose one out of two CH-452 A/B (A) Drug Chemistry (B) Applied Organic Chemistry | 04 | -- | 04 | 40 | -- | 60 | -- | 100 | -- | **04** |
| *CH-O-2 | Core Skill base | Organic Chemistry Practical Course-II | -- | 12 | 12 | -- | 40 | -- | 60 | -- | 100 | **06** |
| *CH-O-3 | Core Skill base | Organic Chemistry Practical Course-III | -- | 12 | 12 | -- | 40 | -- | 60 | -- | 100 | **06** |
| *CH-O-4 | Core Skill base | A Short Research Project | -- | 12 | 12 | -- | 40 | -- | 60 | -- | 100 | **06** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-401 (A)/ (B)/(C)/ (D) | Audit Course | Choose one out of four (AC-401 A/B/C/D) (Professional & Social + Value Added Course) | 02 | -- | 02 | 100 | -- | -- | -- | 100 | -- | **02** |

* To be started from Semester-III & evaluated at the end of Semester-IV

**List of Audit courses to be offered in Semester-IV:**

**AC-401 (A): Human Rights**
**AC-401 (B): Seminar on Review of Research Paper**
**AC-401 (C): Current Affairs**
**AC-401 (D): Intellectual Property Rights**

# KAVAYITRI BAHINABAI CHAUDHARI

# NORTH MAHARASHTRA UNIVERSITY, JALGAON

## Syllabus for M.Sc. Part-II Organic Chemistry

(Semester - III & IV) (With Effect from 2022-23)

### Course Structure for Second Year

The following will be the structure for revised syllabus from June 2022 for Semester III and Semester IV.

| Course Code | Course Type | Title of the Course |
|---|---|---|
| | | **SEMESTER - III** |
| CH-350 | Core | Organic Reaction Mechanism |
| CH-351 | Core | Spectroscopic Methods in Structure Determination |
| CH-352 | Core | Organic Stereochemistry |
| CH-353 | Elective | Choose one out of four (CH-353 A/B/C/D)<br>(A) Heterocyclic Chemistry (B) Green Chemistry |
| AC-301 (A)/(B)/(C)/(D) | Audit Course | Choose one out of four (AC-301 A/B/C/D)<br>(Technology + Value Added Course)<br>AC-301 (A): Computer Skills<br>AC-301 (B): Cyber Security<br>AC-301 (C): Molecular Docking<br>AC-301 (D): Technical Report Writing |
| | | **SEMESTER - IV** |
| CH-450 | Core | Chemistry of Natural Products |
| CH-451 | Core | Synthetic Methods in Organic Chemistry |
| CH-452 | Elective | Drug Chemistry |
| *CH-O-2 | Core Skill base | Organic Chemistry Practical Course-II |
| *CH-O-3 | Core Skill base | Organic Chemistry Practical Course-III |
| *CH-O-4 | Core Skill base | A Short Research Project |
| AC-401 (A)/(B)/(C)/(D) | Audit Course | Choose one out of four (AC-401/402/403/404)<br>(Professional & Social + Value Added Course)<br>AC-401 (A): Human Rights<br>AC-401 (B): Seminar on Review of Research<br>AC-401 (C): Current Affairs<br>AC-401 (D): Intellectual Property Rights |

**CH-O-4: A Short Research Project**

**(180Hrs, 100 Marks and 6 Credits)**

**Course Objectives:**

**CO-1**. To make students familiarize themselves with the techniques such as synthesis, isolation, purification and characterization/analysis etc.

**CO-2**. To introduce students on how to generate new ideas based on literature survey and their Execution.

**CO-3**. To foster the self-confidence amongst the students to think and execute ideas Independently.

The project is allotted during the third semester. The students will get an opportunity to become a part of ongoing research activities in the respective supervisor's laboratory. This should make them familiar with the literature survey and the fundamental understanding of how to devise research methodology.It is expected that the student should learn the synthesis, isolation, purification and characterization techniques whatever applicable for their projects. Students whose projects are dependent on the instruments are expected to know SOP and their working principles. Full flexibility is given to the student in identifying the project depending on the resources and infrastructure available in the host organization. It is recommended to work on multidisciplinary projects but not mandatory. In any case, not more than 2-3 students should involve in the same project.

**The systematic approach towards the execution of the project should be as follows**:

1. Selection of topic relevant to priority areas of chemistry and allied sciences
2. Literature survey and devising research methodology based on the gaps in the literature
3. Good laboratory practices: Safety, MSDS, disposal of chemical waste etc.
4. Execution of the project by designing and performing suitable experiments
5. Interpretation of results and drawing important conclusions
6. To prepare a PowerPoint presentation using modern ICT tools
7. Students should present their research work in Avishkar/Webinars/Conferences
8. Maintaining lab notebooks and writing monthly progress report
9. Writing a dissertation with following components in a given order: Title of the Project, Certificates, Acknowledgement, Abstract and Keywords, Contents, Introduction, Literature, Aim of the Project,Materials and Methods, Results and Discussion, Conclusions and Future Perspectives, Contributions, Bibliography and References. Total three bound copies of the dissertation should be prepared (library, guide and student: each one copy). Student should note that plagiarism is strictly prohibited. Beside writing dissertation, students should write a manuscript/patent if the results obtained are worthy of publication.

10. Presentation during the university examination
11. The complete tenure of research project should be of one year. It should start at the third semester and will be end by the semester fourth.
12. Student should submit two progress report within the span of the project.
13. Student should be encouraged for applied and contemporary research work.
14. Weakly two days should be allotted to research project in a regular time table.
15. Each research group should not have more than four students.
16. Each research group should have different research topic

It highly recommended that the students should apply for the Summer Research Fellowship Programmes initiated by Science Academies of India - IAS, INSA, NASI. Similarly, there exist several other summer internship opportunities in the national institutes, reputed universities and industries. Students should explore these possibilities immediately after the completion of the second semester (M. Sc., Part - 1) meaning that applications should be sent much earlier. The exposure gained during the summer internship should build enough confidence amongst students to identify the right research project and its execution.

**Examination Assessment (100 Marks)**:

**Internal Examination (Internal Assessment)** - 40 marks:

| Activity | Marks |
|---|---|
| Submission of progress reports signed by supervisor (at least 2reports, 05 marks per report) | 10 |
| Outline of research work: - literature collected, experiment planning and design | 08 |
| Experimental work performed | 08 |
| Subject/topic related one workshop/course/instrumentation training (online/offline), | 10 |
| Regular attendance maintained by Research Supervisor | 04 |

**External Examination (External Assessment)** - 60 marks:

| Activity | Marks |
|---|---|
| Selection of topic of project work | 05 |
| Literature review | 05 |
| Characterization of intermediates / products | 10 |
| Overall quality of dissertation | 10 |
| Power point presentation | 15 |
| Oral discussion | 10 |
| Conference / Industrial Visit /Avishkar Participation | 05 |

**Suggested readings**: Reference Books/Reviews/Journal Papers as suggested by the supervisor.

**Course Outcomes (COts):**

Upon the completion of course, the student should be able:

| CO No. | CO | Cognitive level |
|---|---|---|
| **1** | To generate new research ideas based on the comprehensive literature survey | **3** |
| **2** | To acquire skill to execute the research project independently | **2** |
| **3** | To expertise in synthesis techniques and execution of research ideas would make the student quickly employable; either in industries or in academia for pursuing higher studies | **4** |

Secondary Education Society's
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## A Short Research Project

## Allotment of Research Supervisors

## 2023-24

| .Sr. No | Name of the Student | Project Title | Name of the Research Supervisior |
|---|---|---|---|
| 1 | Patil Sayali Vijay | Simple and highly efficient synthesis of thioamide derivative using, Morpholine | Dr. G.R.Chaudhari |
| 2 | Zambare Mayur Kishor | | |
| 3 | Chaudhari Puja Bhagwan | | |
| 4 | Jawale Saurabh Pramod | | |
| 5 | Parit Komal Pralhad | | |
| | | | |
| 1 | Partane Yogesh Sunil | Synthesis of substituted Stilbene under knoevenagel condensation condition | Asst. Prof. R.P. Chaudhari |
| 2 | Chaudhari Rajashri Dinkar | | |
| 3 | Deshmukh Sonali Ashok | | |
| 4 | Chaudhari Deepak Suresh | | |
| 5 | Mahajan Vaibhav Chandrakant | | |
| | | | |
| 1 | Patil Kunal Dhanraj | Synthesis of 5-arylpyrimido[4,5-b]quinoline-dione with calcium carbonate as an environmentally friendly catalyst | Asst. Prof. M.A.Tayade |
| 2 | Bari Chaitali Hiralal | | |
| 3 | Chaudhari Divesh Bapurao | | |
| 4 | Patil Harshala Eknath | | |
| 5 | Kumbhar Yash Narayan | | |
| | | | |
| 1 | Chopade Bhomati Narendra | Simple and highly efficient synthesis of thioamide derivative using Pyrrolidine | Asst. Prof. G.Y.Chaudhari |
| 2 | Mali Sachin Sanjay | | |
| 3 | Patil Rohit Bharat | | |
| 4 | Sarode Yuvaraj Jitendra | | |
| | | | |
| 1 | Patil Hiralal Ladu | Simple and highly efficient synthesis of thioamide derivative using Piperidine | Asst. Prof. F.I.Rane |
| 2 | Chaudhari Ishwar Bhalchandra | | |
| 3 | Chaudhari Shubham Dilip | | |
| 4 | Chaudhari Dipak Dinakar | | |

**Co-ordinator**
**(Dr. G.R.Chaudhari)**

S.E Society's Arts & Science College Bhalod Dist. Jalgaon

**Head**
**(Dr. K.G.Chaudhari)**