

# PG DEPARTMENT OF CHEMISTRY



## SYLLABUS

**2018-2020 BATCH**

### FACULTY MEMBERS

Dr. K. POONKODI, M.Sc.,M.Phil.,Ph.D.

Dr. V. PRABHU, M.Sc., Ph.D.

Ms. K. VIMALADEVI, M.Sc.,M.Phil.,

Ms. R. MINI, M.Sc.,M.Phil.,

Ms. M.ANUSUYA, M.Sc., M.Phil., (Ph.D)



**NGM COLLEGE (Autonomous)**

Affiliated to Bharathiar University

Re-Accredited with 'A' grade by NAAC & ISO 9001:2008 certified

90, Palghat road, Pollachi- 642001, Coimbatore (Dist)

Phone: 04259-234868. 234870 Fax: 04259-234869

**Website:** [www.ngmc.org](http://www.ngmc.org)

## SCHEME OF EXAMINATION

| I SEMESTER  |                       |                                                                              |                            |             |     |     |       |         |
|-------------|-----------------------|------------------------------------------------------------------------------|----------------------------|-------------|-----|-----|-------|---------|
| Part        | Course Code           | Title of the Paper                                                           | Duration in hours per week | Examination |     |     |       | Credits |
|             |                       |                                                                              |                            | Hours       | CIA | ESE | Total |         |
| III         | 18PCY101              | Inorganic Chemistry -I                                                       | 5                          | 3           | 25  | 75  | 100   | 5       |
| III         | 18PCY102              | Organic Chemistry -I                                                         | 5                          | 3           | 25  | 75  | 100   | 5       |
| III         | 18PCY103              | Physical Chemistry -I                                                        | 5                          | 3           | 25  | 75  | 100   | 5       |
| III         | 18PCY207              | Inorganic Chemistry Practical-I                                              | 5                          | 6           | --  | --  | --    | --      |
| III         | 18PCY208              | Organic Chemistry Practical-I                                                | 5                          | 6           | --  | --  | --    | --      |
| III         | 18PCY209              | Physical Chemistry Practical -I                                              | 5                          | 6           | --  | --  | --    | --      |
|             |                       |                                                                              |                            |             |     |     | 300   | 15      |
| II SEMESTER |                       |                                                                              |                            |             |     |     |       |         |
| Part        | Course Code           | Title of the Paper                                                           | Duration in hours per week | Examination |     |     |       | Credits |
|             |                       |                                                                              |                            | Hours       | CIA | ESE | Total |         |
| III         | 18PCY204              | Inorganic Chemistry-II                                                       | 5                          | 3           | 25  | 75  | 100   | 5       |
| III         | 18PCY205              | Organic Chemistry-II                                                         | 5                          | 3           | 25  | 75  | 100   | 5       |
| III         | 18PCY206              | Physical Chemistry-II                                                        | 5                          | 3           | 25  | 75  | 100   | 5       |
| IV          | 18PCY2N1/<br>18PCY2N2 | Non-Major Elective:<br>Chemistry in day today life /<br>Chemistry in context | 1                          | 3           | --  | 100 | 100   | 2       |
| III         | 18PCY207              | Inorganic Chemistry Practical - I                                            | 5                          | 6           | 40  | 60  | 100   | 3       |
| III         | 18PCY208              | Organic Chemistry Practical -I                                               | 5                          | 6           | 40  | 60  | 100   | 3       |
| III         | 18PCY209              | Physical Chemistry Practical -I                                              | 4                          | 6           | 40  | 60  | 100   | 4       |
|             |                       |                                                                              |                            |             |     |     | 700   | 27      |

### III SEMESTER

| Part | Course Code | Title of the Paper                                         | Duration in hours per week | Examination |     |     |       | Credits |
|------|-------------|------------------------------------------------------------|----------------------------|-------------|-----|-----|-------|---------|
|      |             |                                                            |                            | Hours       | CIA | ESE | Total |         |
| III  | 18PCY310    | Organic Chemistry -III                                     | 5                          | 3           | 25  | 75  | 100   | 5       |
| III  | 18PCY3E1    | Major Elective-I- Spectroscopy                             | 5                          | 3           | 25  | 75  | 100   | 5       |
| III  | 18PCY311    | Physical Chemistry - III                                   | 5                          | 3           | 25  | 75  | 100   | 5       |
| III  | 18PCY3E2    | Major Elective –II-Green, Nanochemistry and Cyber Security | 3                          | 3           | 25  | 75  | 100   | 3       |
| III  | 18PCY414    | Inorganic Chemistry Practical -II                          | 3                          | 6           | --  | --  | --    | --      |
| III  | 18PCY415    | Organic Chemistry Practical -II                            | 3                          | 6           | --  | --  | --    | --      |
| III  | 18PCY416    | Physical Chemistry Practical -II                           | 4                          | 6           | --  | --  | --    | --      |
| IV   | 18PCY417    | Project Work                                               | 2                          | 6           | --  | --  | --    | --      |
|      |             |                                                            |                            |             |     |     | 400   | 18      |

### IV SEMESTER

| Part               | Course Code | Title of the Paper                            | Duration in hours per week | Examination |     |     |             | Credits   |
|--------------------|-------------|-----------------------------------------------|----------------------------|-------------|-----|-----|-------------|-----------|
|                    |             |                                               |                            | Hours       | CIA | ESE | Total       |           |
| III                | 18PCY412    | Inorganic Chemistry -III                      | 5                          | 3           | 25  | 75  | 100         | 4         |
| III                | 18PCY4E3    | Major Elective-III – Applied electrochemistry | 5                          | 3           | 25  | 75  | 100         | 3         |
| III                | 18PCY413    | Physical methods in chemistry                 | 5                          | 3           | 25  | 75  | 100         | 5         |
| III                | 18PCY414    | Inorganic Chemistry Practical -II             | 4                          | 6           | 40  | 60  | 100         | 3         |
| III                | 18PCY415    | Organic Chemistry Practical -II               | 4                          | 6           | 40  | 60  | 100         | 3         |
| III                | 18PCY416    | Physical Chemistry Practical -II              | 4                          | 6           | 40  | 60  | 100         | 4         |
| IV                 | 18PCY417    | Project Work & viva voce                      | 3                          | 6           | 40  | 160 | 200         | 8         |
|                    |             |                                               |                            |             |     |     | 800         | 30        |
| <b>TOTAL MARKS</b> |             |                                               |                            |             |     |     | <b>2200</b> | <b>90</b> |

|                        |                 |                          |                     |           |
|------------------------|-----------------|--------------------------|---------------------|-----------|
| <b>Programme code:</b> | M.Sc.           | <b>Programme Title :</b> | Master of Chemistry |           |
| <b>Course Code:</b>    | <b>18PCY420</b> | Project Work & Viva-Voce | <b>Batch</b>        | 2018-2020 |
|                        |                 |                          | <b>Semester</b>     | III & IV  |
| <b>Hrs/Week:</b>       | 2&3             | <b>Total Hrs: 65</b>     | <b>Credits:</b>     | 8         |

### Course Objective

- To arm the future chemist with the knowledge of research in various fields.
- To gain knowledge about different steps of research and article publications.

### Course Outcomes (CO)

|    |     |                                                                                                                        |
|----|-----|------------------------------------------------------------------------------------------------------------------------|
| K3 | CO1 | To apply the various preliminary skills in laboratory                                                                  |
| K4 | CO2 | To analyse the various sources of literature review                                                                    |
| K5 | CO3 | To evaluate the various techniques from the previous studies and to apply the suitable parameters in the project work. |

Note:- The Project work dissertation evaluation and viva-voce examination will be Conducted jointly by the Internal and External Examiners.

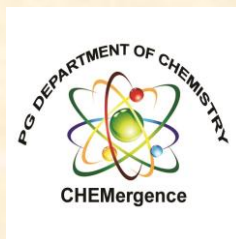
### Mapping

| PSO<br>CO  | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------------|------|------|------|------|------|
| <b>CO1</b> | S    | S    | S    | S    | S    |
| <b>CO2</b> | S    | S    | S    | S    | S    |
| <b>CO3</b> | S    | S    | S    | S    | S    |

S-Strong; H-High; M-Medium; L-Low

  
**Dr. R. MANICKA CHEZIAN** M.Sc., M.S., Ph.D.,  
 PRINCIPAL i/c  
 Nallamuthu Gounder Mahalingam College  
 Pollachi - 642 001, Coimbatore District.

## PG DEPARTMENT OF CHEMISTRY



### SYLLABUS

2019-2021 BATCH

### FACULTY MEMBERS

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### SCHEME OF EXAMINATION

| SEM                                                      | Course Code           | Title of the Paper                                                            | Duration in hours per week | Examination |     |     |            | Credits   |
|----------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------|----------------------------|-------------|-----|-----|------------|-----------|
|                                                          |                       |                                                                               |                            | Hours       | CIA | ESE | Total      |           |
| I                                                        | 19PCY101              | Inorganic Chemistry -I                                                        | 5                          | 3           | 25  | 75  | 100        | 5         |
| I                                                        | 19PCY102              | Organic Chemistry -I                                                          | 5                          | 3           | 25  | 75  | 100        | 5         |
| I                                                        | 19PCY103              | Physical Chemistry -I                                                         | 5                          | 3           | 25  | 75  | 100        | 5         |
| I                                                        | 19PCY207              | Inorganic Chemistry Practical-I                                               | 5                          | --          | --  | --  | --         | --        |
| I                                                        | 19PCY208              | Organic Chemistry Practical-I                                                 | 5                          | --          | --  | --  | --         | --        |
| I                                                        | 19PCY209              | Physical Chemistry Practical -I                                               | 5                          | --          | --  | --  | --         | --        |
| <b>TOTAL MARKS</b>                                       |                       |                                                                               |                            |             |     |     | <b>300</b> | <b>15</b> |
| SEM                                                      | Course Code           | Title of the Paper                                                            | Duration in hours per week | Examination |     |     |            | Credits   |
|                                                          |                       |                                                                               |                            | Hours       | CIA | ESE | Total      |           |
| II                                                       | 19PCY204              | Inorganic Chemistry-II                                                        | 5                          | 3           | 25  | 75  | 100        | 5         |
| II                                                       | 19PCY205              | Organic Chemistry-II                                                          | 5                          | 3           | 25  | 75  | 100        | 5         |
| II                                                       | 19PCY206              | Physical Chemistry-II                                                         | 5                          | 3           | 25  | 75  | 100        | 5         |
| II                                                       | 19PCY2N1/<br>19PCY2N2 | *Non-Major Elective:<br>Chemistry in day today life /<br>Chemistry in context | 1                          | 3           | --  | 100 | 100        | 2         |
| II                                                       | 19PCY207              | Inorganic Chemistry Practical - I                                             | 5                          | 6           | 40  | 60  | 100        | 3         |
| II                                                       | 19PCY208              | Organic Chemistry Practical-I                                                 | 5                          | 6           | 40  | 60  | 100        | 3         |
| II                                                       | 19PCY209              | Physical Chemistry Practical -I                                               | 4                          | 6           | 40  | 60  | 100        | 4         |
| * Students can choose any one of the papers as electives |                       |                                                                               |                            |             |     |     |            |           |
| <b>TOTAL MARKS</b>                                       |                       |                                                                               |                            |             |     |     | <b>700</b> | <b>27</b> |

| SEM                | Course Code                                              | Title of the Paper                                                                                                                                                                        | Duration in hours per week | Examination |     |     |             | Credits   |
|--------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------|-----|-----|-------------|-----------|
|                    |                                                          |                                                                                                                                                                                           |                            | Hours       | CIA | ESE | Total       |           |
| III                | 19PCY310                                                 | Organic Chemistry -III                                                                                                                                                                    | 5                          | 3           | 25  | 75  | 100         | 5         |
| III                | 19PCY3E1/<br>3E2/3E3                                     | * <b>Major Elective-I</b><br>Spectroscopy/ Applied<br>Electro Chemistry/<br>Polymer Chemistry                                                                                             | 5                          | 3           | 25  | 75  | 100         | 5         |
| III                | 19PCY311                                                 | Physical Chemistry - III                                                                                                                                                                  | 5                          | 3           | 25  | 75  | 100         | 5         |
| III                | 19PCY3E4/<br>3E5/3E6                                     | * <b>Major Elective –II</b><br>Green, Nanochemistry and<br>Cyber Security/ Water<br>Pollution and Industrial<br>Effluents treatment / Nano<br>Technology and Supra<br>Molecular Chemistry | 3                          | 3           | 25  | 75  | 100         | 3         |
| III                | 19PCY414                                                 | Inorganic Chemistry<br>Practical -II                                                                                                                                                      | 4                          | 6           | --  | --  | --          | --        |
| III                | 19PCY415                                                 | Organic Chemistry<br>Practical -II                                                                                                                                                        | 3                          | 6           | --  | --  | --          | --        |
| III                | 19PCY416                                                 | Physical Chemistry<br>Practical -II                                                                                                                                                       | 3                          | 6           | --  | --  | --          | --        |
| III                | 19PCY417                                                 | Project Work/Literature<br>review                                                                                                                                                         | 2                          | 6           | 40  | --  | 40          | --        |
|                    | * Students can choose any one of the papers as electives |                                                                                                                                                                                           |                            |             |     |     |             |           |
| <b>TOTAL MARKS</b> |                                                          |                                                                                                                                                                                           |                            |             |     |     | <b>440</b>  | <b>18</b> |
| SEM                | Course Code                                              | Title of the Paper                                                                                                                                                                        | Duration in hours per week | Examination |     |     |             | Credits   |
|                    |                                                          |                                                                                                                                                                                           |                            | Hours       | CIA | ESE | Total       |           |
| IV                 | 19PCY412                                                 | Inorganic Chemistry -III                                                                                                                                                                  | 5                          | 3           | 25  | 75  | 100         | 5         |
| IV                 | 19PCY4E7/<br>4E8/ 4E9                                    | * <b>Major Elective-III</b><br>Medicinal Chemistry/ Food<br>Science and Technology/<br>Dye Chemistry                                                                                      | 4                          | 3           | 25  | 75  | 100         | 3         |
| IV                 | 19PCY413                                                 | Physical methods in<br>chemistry                                                                                                                                                          | 5                          | 3           | 25  | 75  | 100         | 5         |
| IV                 | 19PCY414                                                 | Inorganic Chemistry<br>Practical -II                                                                                                                                                      | 5                          | 6           | 40  | 60  | 100         | 3         |
| IV                 | 19PCY415                                                 | Organic Chemistry Practical<br>-II                                                                                                                                                        | 4                          | 6           | 40  | 60  | 100         | 3         |
| IV                 | 19PCY416                                                 | Physical Chemistry<br>Practical -II                                                                                                                                                       | 4                          | 6           | 40  | 60  | 100         | 4         |
| IV                 | 19PCY417                                                 | Project Work & viva voce                                                                                                                                                                  | 3                          | 6           | 40  | 120 | 160         | 7         |
|                    | * Students can choose any one of the papers as electives |                                                                                                                                                                                           |                            |             |     |     |             | 760       |
| <b>TOTAL MARKS</b> |                                                          |                                                                                                                                                                                           |                            |             |     |     | <b>2200</b> | <b>90</b> |

|                        |                 |                                     |                     |           |
|------------------------|-----------------|-------------------------------------|---------------------|-----------|
| <b>Programme code:</b> | M.Sc.           | <b>Programme Title :</b>            | Master of Chemistry |           |
| <b>Course Code:</b>    | <b>19PCY420</b> | <b>Project Work &amp; Viva-Voce</b> | <b>Batch</b>        | 2019-2021 |
|                        |                 |                                     | <b>Semester</b>     | III & IV  |
| <b>Hrs/Week:</b>       | 2&3             | <b>Total Hrs: 65</b>                | <b>Credits:</b>     | 7         |

### Course Objective

- To arm the future chemist with the knowledge of research in various fields.
- To gain knowledge about different steps of research and article publications.

### Course Outcomes (CO)

|    |     |                                                                                                                        |
|----|-----|------------------------------------------------------------------------------------------------------------------------|
| K3 | CO1 | To apply the various preliminary skills in laboratory                                                                  |
| K4 | CO2 | To analyse the various sources of literature review                                                                    |
| K5 | CO3 | To evaluate the various techniques from the previous studies and to apply the suitable parameters in the project work. |

Note:- The Project work dissertation evaluation and viva-voce examination will be Conducted jointly by the Internal and External Examiners.

### Mapping

| PSO \ CO   | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------------|------|------|------|------|------|
| <b>CO1</b> | S    | S    | S    | S    | S    |
| <b>CO2</b> | S    | S    | S    | S    | S    |
| <b>CO3</b> | S    | S    | S    | S    | S    |

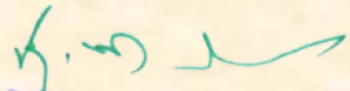
S-Strong;

H-High;

M-Medium;

L-Low

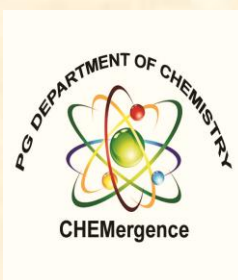
|                           |                           |                     |                      |
|---------------------------|---------------------------|---------------------|----------------------|
| <b>Course Designed by</b> | <b>Verified by HoD</b>    | <b>Checked by</b>   | <b>Approved by</b>   |
| <b>Name and Signature</b> | <b>Name and Signature</b> | <b>CDC</b>          | <b>COE</b>           |
| Name:<br>Dr.K.Poonkodi    | Name:Dr.K.Poonkodi        | Name:Dr.M.Durairaju | Name:Dr.Muthukumaran |
| Signature:                | Signature:                | Signature:          | Signature:           |

  
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**PG DEPARTMENT OF CHEMISTRY**

**SYLLABUS**

**2020-2022 Batch**



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## I- SEMESTER

## II-SEMESTER

| SEM                                                      | Course Code           | Title of the Paper                                                        | Duration in hours per week | Examination |     |     |       | Credits |
|----------------------------------------------------------|-----------------------|---------------------------------------------------------------------------|----------------------------|-------------|-----|-----|-------|---------|
|                                                          |                       |                                                                           |                            | Hours       | CIA | ESE | Total |         |
| II                                                       | 20PCY204              | Inorganic Chemistry –II- Coordination and Organometallic Chemistry        | 5                          | 3           | 25  | 75  | 100   | 5       |
| II                                                       | 20PCY205              | Organic Chemistry-II – Organic Reactions and Stereochemistry              | 5                          | 3           | 25  | 75  | 100   | 5       |
| II                                                       | 20PCY206              | Physical Chemistry-II – Quantum and Electrochemistry                      | 5                          | 3           | 25  | 75  | 100   | 5       |
| II                                                       | 20PCY2N1/<br>20PCY2N2 | *Non-Major Elective: Chemistry in day today life/<br>Chemistry in context | 1                          | 3           | --  | 100 | 100   | 2       |
| II                                                       | 20PCY207              | Inorganic Chemistry Practical - I                                         | 5                          | 6           | 40  | 60  | 100   | 3       |
| II                                                       | 20PCY208              | Organic Chemistry Practical-I                                             | 5                          | 6           | 40  | 60  | 100   | 3       |
| II                                                       | 20PCY209              | Physical Chemistry Practical -I                                           | 4                          | 6           | 40  | 60  | 100   | 4       |
| * Students can choose any one of the papers as electives |                       |                                                                           |                            |             |     |     |       |         |
| TOTAL MARKS                                              |                       |                                                                           |                            |             |     |     | 700   | 27      |

### III-SEMESTER

| SEM | Course Code                                              | Title of the Paper                                                                                                                                                | Duration in hours per week | Examination   |     |     |           | Credits |
|-----|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-----|-----|-----------|---------|
|     |                                                          |                                                                                                                                                                   |                            | H<br>ou<br>rs | CIA | ESE | Tot<br>al |         |
| III | 20PCY310                                                 | Organic Chemistry – III – Natural Products and Organic Reagents                                                                                                   | 5                          | 3             | 25  | 75  | 100       | 5       |
| III | 20PCY3E1 / 3E2/3E3                                       | * Major Elective-I Spectroscopy/ Applied Electro Chemistry/ Polymer Chemistry                                                                                     | 5                          | 3             | 25  | 75  | 100       | 5       |
| III | 20PCY311                                                 | Physical Chemistry –III – Thermodynamics and Catalysis                                                                                                            | 5                          | 3             | 25  | 75  | 100       | 5       |
| III | 20PCY3E4 / 3E5/3E6                                       | * Major Elective –II Green, Nano chemistry and Cyber Security/ Water Pollution and Industrial Effluents treatment / Nano Technology and Supra Molecular Chemistry | 3                          | 3             | 25  | 75  | 100       | 3       |
| III | 20PCY414                                                 | Inorganic Chemistry Practical -II                                                                                                                                 | 4                          | 6             | --  | --  | --        | --      |
| III | 20PCY415                                                 | Organic Chemistry Practical -II                                                                                                                                   | 4                          | 6             | --  | --  | --        | --      |
| III | 20PCY416                                                 | Physical Chemistry Practical -II                                                                                                                                  | 4                          | 6             | --  | --  | --        | --      |
|     | * Students can choose any one of the papers as electives |                                                                                                                                                                   |                            |               |     |     | 400       | 18      |

## IV-SEMESTER

| SE<br>M                                                         | Course<br>Code               | Title of the Paper                                                                                      | Duration<br>in hours<br>per week | Examination |         |         |             | Credit<br>s |
|-----------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------|-------------|---------|---------|-------------|-------------|
|                                                                 |                              |                                                                                                         |                                  | Hours       | CI<br>A | ES<br>E | Total       |             |
| <b>IV</b>                                                       | 20PCY4<br>12                 | Inorganic Chemistry<br>–III- Bioinorganic and<br>Inner Transition<br>Elements                           | 5                                | 3           | 25      | 75      | 100         | 5           |
| <b>IV</b>                                                       | 20PCY4<br>E7/<br>4E8/<br>4E9 | <b>* Major Elective-III</b><br>Medicinal Chemistry/<br>Food Science and<br>Technology/ Dye<br>Chemistry | 4                                | 3           | 25      | 75      | 100         | 3           |
| <b>IV</b>                                                       | 20PCY4<br>13                 | Physical methods in<br>chemistry                                                                        | 5                                | 3           | 25      | 75      | 100         | 5           |
| <b>IV</b>                                                       | 20PCY4<br>14                 | Phytochemical<br>techniques and<br>health chemistry                                                     | Self -<br>study                  | --          | --      | 100     | 100         | 1           |
| <b>IV</b>                                                       | 20PCY4<br>15                 | Inorganic Chemistry<br>Practical -II                                                                    | 5                                | 6           | 40      | 60      | 100         | 3           |
| <b>IV</b>                                                       | 20PCY4<br>16                 | Organic Chemistry<br>Practical -II                                                                      | 4                                | 6           | 40      | 60      | 100         | 3           |
| <b>IV</b>                                                       | 20PCY4<br>17                 | Physical Chemistry<br>Practical -II                                                                     | 4                                | 6           | 40      | 60      | 100         | 4           |
| <b>IV</b>                                                       | 20PCY4<br>18                 | Project Work & viva<br>voce                                                                             | 3                                | 6           | 20      | 80      | 100         | 6           |
| <b>* Students can choose any one of the papers as electives</b> |                              |                                                                                                         |                                  |             |         |         | 800         | 30          |
| TOTAL MARKS                                                     |                              |                                                                                                         |                                  |             |         |         | <b>2200</b> | <b>90</b>   |

|                        |                 |                                     |                     |           |
|------------------------|-----------------|-------------------------------------|---------------------|-----------|
| <b>Programme code:</b> | M.Sc.           | <b>Programme Title :</b>            | Master of Chemistry |           |
| <b>Course Code:</b>    | <b>20PCY418</b> | <b>Project Work &amp; Viva-Voce</b> | <b>Batch</b>        | 2020-2022 |
|                        |                 |                                     | <b>Semester</b>     | IV        |
| <b>Hrs/Week:</b>       | 3               | <b>Total Hrs: 26</b>                | <b>Credits:</b>     | 6         |

### Course Objective

1. To design research oriented project on particular context.
2. To identify the topic with the consideration feasibility and search literature on selected research oriented project work.
3. To conduct experiment scientifically with safety and utilize the techniques learn earlier for the synthesis of bioactive molecules with the help of named reactions and rearrangements.
4. To characterize the prepared molecules by physical and spectral analysis like IR,  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR and Mass Spectroscopy.
5. To prepare a dissertation report with complete follow up of research methodology and develop the skill of communication in presentation by utilizing various software such as ChemDraw, Origin, MS-Office etc.

### Course Outcomes (CO)

|    |     |                                                           |
|----|-----|-----------------------------------------------------------|
| K3 | CO1 | Apply the various preliminary skills in laboratory        |
| K4 | CO2 | Analyze the various sources of literature review          |
| K5 | CO3 | Evaluate the various techniques from the previous studies |
| K5 | CO4 | Apply the suitable parameters in the project work.        |

### Individual Project and Viva Voce

- Each faculty will be allotted 4/5 students.
- The topic/area of work will be finalized at the end of III semester, allowing scope for the students to gather relevant literature during the vacation.
- The research work can be carried out in the college or at any other organization approved by the College.
- Viva Voce/Power point presentation will be conducted by a panel comprising of HOD, internal / external examiners.

### Research Areas

Synthetic Organic Chemistry, Coordination Chemistry, Phytochemistry, Surface Chemistry and Nanochemistry, etc.,

### Methodology

Each project should contain Introduction, Review of Literature, Materials and Methods, Results and Discussions – evidences in the form of figures, tables and photographs, Summary and Bibliography

**Evaluation - Total - 100 Marks (Internal – 20 marks, External – 80 marks)****Internal****Total - 20 marks**

I Review – Selection of the field of study, Topic &amp; Literature collection

II Review – Research Design and Data Collection

III Review – Analysis &amp; Conclusion, Preparation of rough draft

Paper Presentation in National / International Conference

(Or)

Paper Publication in UGC Care list Journals

- 20 marks

**External****Total – 80 marks**

| <b>Project</b>                                   | <b>Total – 60 marks</b> |
|--------------------------------------------------|-------------------------|
| Relevance of the topic to the academic / society | 10 Marks                |
| Objectives                                       | 10 Marks                |
| Experimental design                              | 20 Marks                |
| Expression of results and discussion             | 20 Marks                |
| <b>Viva Voce</b>                                 | <b>Total – 20 marks</b> |
| Presentation                                     | 10 Marks                |
| Discussion                                       | 10 Marks                |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------|-----|-----|-----|-----|-----|
| CO1      | 3   | 3   | 2   | 3   | 3   |
| CO2      | 3   | 3   | 3   | 3   | 3   |
| CO3      | 3   | 2   | 3   | 3   | 3   |
| CO4      | 3   | 3   | 3   | 3   | 2   |
| CO5      | 3   | 3   | 3   | 3   | 3   |

3-High; 2-Medium; 1-Low

| Course Designed by                                                                   | Verified by HoD     | Checked by               | Approved by                |
|--------------------------------------------------------------------------------------|---------------------|--------------------------|----------------------------|
| Name and Signature                                                                   | Name and Signature  | CDC                      | COE                        |
| Name: Dr.K.Poonkodi<br>Dr.V.Prabhu<br>Ms.K.Vimaladevi<br>Ms. R.Mini<br>Ms. M.Anusuya | Name: Dr.K.Poonkodi | Name:<br>Mr.K.Srinivasan | Name:<br>Dr.R.Muthukumaran |
| Signature:                                                                           | Signature:          | Signature:               | Signature:                 |

# **PG DEPARTMENT OF CHEMISTRY**

## **SYLLABUS**

**2021-2023 Batch**



**Dr. K. POONKODI, M.Sc., M.Phil., Ph.D.**

**Mrs. K. VIMALADEVI, M.Sc., M.Phil., (Ph.D)**

**Ms. R. MINI, M.Sc., M.Phil., (Ph.D)**

**Dr. V. PRABHU, M.Sc., Ph.D.**

**Mrs. M. ANUSUYA, M.Sc., M.Phil., (Ph.D)**



## **NGM COLLEGE (Autonomous)**

**Affiliated to Bharathiar University**

**Re-Accredited by NAAC & ISO 9001:2015 certified**

**90, Palghat Road, Pollachi- 642001, Coimbatore (Dist.)**

**Phone: 04259-234868. 234870 Fax: 04259-234869**

**Website: [www.ngmc.org](http://www.ngmc.org)**

## SCHEME OF SYLLABUS & EXAMINATION



**NALLAMUTHU GOUNDER MAHALINGAM COLLEGE, POLLACHI**

(Autonomous, Affiliated to Bharathiar University)  
Accredited by NAAC, An ISO 9001: 2015 institution



### SEMESTER - I

| Semester     | Subject Code | Title of the Paper                                        | Hrs / Week |           | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|--------------|-----------------------------------------------------------|------------|-----------|------------|-----------|---------------|------------|-------------|-----------|
|              |              |                                                           | L          | P         | T          |           | Internal      | External   |             |           |
| I            | 21PCY101     | Inorganic Chemistry –I- Solid State and Nuclear Chemistry | 5          | --        | 75         | 3         | 50            | 50         | 100         | 4         |
|              | 21PCY102     | Organic Chemistry – I- Reactions and Mechanisms           | 5          | --        | 75         | 3         | 50            | 50         | 100         | 5         |
|              | 21PCY103     | Physical Chemistry –I- Group Theory and Chemical Kinetics | 5          | --        | 75         | 3         | 50            | 50         | 100         | 5         |
|              | 21PCY207     | Inorganic Chemistry Practical-I                           | --         | 5         | 75         | --        | --            | --         | --          | --        |
|              | 21PCY208     | Organic Chemistry Practical-I                             | --         | 5         | 75         | --        | --            | --         | --          | --        |
|              | 21PCY209     | Physical Chemistry Practical –I                           | --         | 5         | 75         | --        | --            | --         | --          | --        |
| <b>Total</b> |              |                                                           | <b>15</b>  | <b>15</b> | <b>450</b> | <b>9</b>  | <b>150</b>    | <b>150</b> | <b>300</b>  | <b>14</b> |

## SEMESTER - II

| Semester     | Subject Code | Title of the Paper                                                 | Hrs / Week |           | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|--------------|--------------------------------------------------------------------|------------|-----------|------------|-----------|---------------|------------|-------------|-----------|
|              |              |                                                                    | L          | P         | T          |           | Internal      | External   |             |           |
| II           | 21PCY204     | Inorganic Chemistry –II- Coordination and Organometallic Chemistry | 5          | --        | 75         | 3         | 50            | 50         | 100         | 4         |
|              | 21PCY205     | Organic Chemistry-II –Organic Reactions and Stereochemistry        | 5          | --        | 75         | 3         | 50            | 50         | 100         | 5         |
|              | 21PCY206     | Physical Chemistry-II – Quantum and Electrochemistry               | 5          | --        | 75         | 3         | 50            | 50         | 100         | 4         |
|              | 21PCY2EA     | *Major Elective –I – Green, Nanochemistry & Cyber Security         | 3          | --        | 45         | 3         | 50            | 50         | 100         | 3         |
|              | 21PCY2EB     | *Food Science and Technology                                       |            |           |            |           |               |            |             |           |
|              | 21PCY2EC     | * Advanced Polymeric Materials                                     |            |           |            |           |               |            |             |           |
|              | 21PCY2N      | *Non Major Elective Chemistry in day to day life                   | 2          |           | 30         | 3         | 50            | 50         | 100         | 2         |
|              | 21PCY207     | Inorganic Chemistry Practical -I                                   | --         | 4         | 60         | 6         | 50            | 50         | 100         | 4         |
|              | 21PCY208     | Organic Chemistry Practical-I                                      | --         | 3         | 45         | 6         | 50            | 50         | 100         | 4         |
|              | 21PCY209     | Physical Chemistry Practical -I                                    | --         | 3         | 45         | 6         | 50            | 50         | 100         | 4         |
| <b>Total</b> |              |                                                                    | <b>20</b>  | <b>10</b> | <b>450</b> | <b>33</b> | <b>400</b>    | <b>400</b> | <b>800</b>  | <b>30</b> |

### SEMESTER - III

| Semester     | Subject Code | Title of the Paper                                                | Hrs / Week |           | Hrs / Sem. | Exam Hrs. | Maximum Marks |            | Total Marks | Credits   |
|--------------|--------------|-------------------------------------------------------------------|------------|-----------|------------|-----------|---------------|------------|-------------|-----------|
|              |              |                                                                   | L          | P         | T          |           | Internal      | External   |             |           |
| III          | 21PCY310     | Organic Chemistry –III– Natural Products and Organic Reagents     | 5          |           | 75         | 3         | 50            | 50         | 100         | 5         |
|              | 21PCY311     | Physical Chemistry –III –Classical and Statistical Thermodynamics | 5          |           | 75         | 3         | 50            | 50         | 100         | 4         |
|              | 21PCY312     | Spectroscopic Techniques – Application in Organic Chemistry       | 5          |           | 75         | 3         | 50            | 50         | 100         | 5         |
|              | 21PCY3EA     | Major Elective -II – Applied Electrochemistry                     |            |           |            |           |               |            |             |           |
|              | 21PCY3EB     | * Nanoscience and Nanotechnology                                  | 3          |           | 45         | 3         | 50            | 50         | 100         | 3         |
|              | 21PCY3EC     | *Dye chemistry                                                    |            |           |            |           |               |            |             |           |
|              | 20PCY415     | Inorganic Chemistry Practical-II                                  | --         | 4         | 60         | --        | --            | --         | --          | --        |
|              | 20PCY416     | Organic Chemistry Practical–II                                    | --         | 4         | 60         | --        | --            | --         | --          | --        |
|              | 20PCY417     | Physical Chemistry Practical–II                                   | --         | 4         | 60         | --        | --            | --         | --          | --        |
| <b>Total</b> |              |                                                                   | <b>18</b>  | <b>12</b> | <b>450</b> | <b>12</b> | <b>200</b>    | <b>200</b> | <b>400</b>  | <b>17</b> |

| SEMESTER - IV                                            |              |                                                                     |            |    |            |           |               |          |             |         |
|----------------------------------------------------------|--------------|---------------------------------------------------------------------|------------|----|------------|-----------|---------------|----------|-------------|---------|
| Semester                                                 | Subject Code | Title of the Paper                                                  | Hrs / Week |    | Hrs / Sem. | Exam Hrs. | Maximum Marks |          | Total Marks | Credits |
|                                                          |              |                                                                     | L          | P  | T          |           | Internal      | External |             |         |
| IV                                                       | 21PCY413     | Inorganic Chemistry –III- Bioinorganic and Inorganic Photochemistry | 5          | -- | 75         | 3         | 50            | 50       | 100         | 5       |
|                                                          | 21PCY414     | Analytical Techniques                                               | 5          | -- | 75         | 3         | 50            | 50       | 100         | 4       |
|                                                          | 21PCY4EA     | *Major Elective –III-Medicinal Chemistry                            | 3          |    | 45         | 3         | 50            | 50       | 100         | 3       |
|                                                          | 21PCY4EB     | *Computational Chemistry                                            |            |    |            |           |               |          |             |         |
|                                                          | 21PCY4EC     | *Green Chemistry                                                    |            |    |            |           |               |          |             |         |
|                                                          | 21PCY415     | Inorganic Chemistry Practical-II                                    | --         | 5  | 75         | 6         | 50            | 50       | 100         | 4       |
|                                                          | 21PCY416     | Organic Chemistry Practical-II                                      | --         | 5  | 75         | 6         | 50            | 50       | 100         | 4       |
|                                                          | 21PCY417     | Physical Chemistry Practical –II                                    | --         | 5  | 75         | 6         | 50            | 50       | 100         | 4       |
|                                                          | 21PCY418     | Project Work & Viva Voce                                            | --         | -  | -          | 6         | 50            | 50       | 100         | 5       |
|                                                          |              | Library                                                             | 2          |    |            |           |               |          |             |         |
| * Students can choose any one of the papers as electives |              |                                                                     |            |    |            |           |               |          |             |         |
| Total                                                    |              |                                                                     | 15         | 15 | 420        | 33        | 350           | 350      | 700         | 29      |
| Grand Total ( Total Marks + Total Credits)               |              |                                                                     |            |    |            |           |               |          | 2200        | 90      |

|                                                                                                                                                            |          |                 |   |                          |                     |                 |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|---|--------------------------|---------------------|-----------------|-----------|
| <b>Programme code:</b>                                                                                                                                     | M.Sc.    |                 |   | <b>Programme Title :</b> | Master of Chemistry |                 |           |
| <b>Course Code:</b>                                                                                                                                        | 21PCY418 |                 |   | Project Work & Viva-Voce |                     | <b>Batch</b>    | 2021-2023 |
|                                                                                                                                                            |          |                 |   |                          |                     | <b>Semester</b> | IV        |
| <b>Lecture Hrs/Week:</b>                                                                                                                                   | -        | <b>Tutorial</b> | - | <b>Total Hrs/Sem</b>     | -                   | <b>Credits:</b> | 5         |
| <b>Course Objective</b>                                                                                                                                    |          |                 |   |                          |                     |                 |           |
| * Make the students to understand the importance of experimental analysis, scientific approach in solving problems related to the environment and society. |          |                 |   |                          |                     |                 |           |
| * Educate and train the students to write scientific papers.                                                                                               |          |                 |   |                          |                     |                 |           |

### Course Outcomes (CO)

On the successful completion of the course, students will be able to

| #                                                                       | Course Outcomes (CO)                                            | Knowledge Level |
|-------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------|
| CO1                                                                     | Apply the various preliminary skills in laboratory.             | K3              |
| CO2                                                                     | Analyze the various sources of literature review.               | K4              |
| CO3                                                                     | Evaluate the various techniques from the previous studies.      | K5              |
| CO4                                                                     | Apply the suitable parameters in the project work.              | K5              |
| CO5                                                                     | Synthesis the various organic, nano and co-ordination compounds | K6              |
| K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate |                                                                 |                 |

### Individual Project and Viva Voce

- Each faculty will be allotted 4/5 students.
- The topic/area of work will be finalized at the end of III semester, allowing scope for the students to gather relevant literature during the vacation.
- The research work can be carried out in the college or at any other organization approved by the College.
- Viva Voce/Power point presentation will be conducted by a panel comprising of HOD, internal / external examiners.

### Research Areas

Synthetic Organic Chemistry, Coordination Chemistry, Phytochemistry, Surface Chemistry and Nanochemistry, etc.,

### Methodology

Each project should contain Introduction, Review of Literature, Materials and Methods, Results and Discussions – evidences in the form of figures, tables and photographs, Summary and Bibliography

**Evaluation - Total - 100 Marks (Internal – 50 marks, External – 50 marks)**

**Internal**

**Total – 50 marks**

| Review     |                                                                                                                  | Marks     |
|------------|------------------------------------------------------------------------------------------------------------------|-----------|
| <b>I</b>   | Selection of the field of study, Topic & Literature collection                                                   | <b>50</b> |
| <b>II</b>  | Research Design and Data Collection                                                                              |           |
| <b>III</b> | Analysis & Conclusion, Preparation of rough draft                                                                |           |
| <b>IV</b>  | Paper Presentation in National / International Conference<br>(Or)<br>Paper Publication in UGC Care list Journals |           |

**RULES GOVERNING THE EVALUATION OF PROJECT REPORT AND VIVA VOCE**

**1. SELECTION OF TOPIC:**

Each student shall select a topic for his / her project in consultation with his / her Guide and the Head of the Department.

2. The project report should contain a minimum of 50 pages in A4 format excluding bibliography and appendices.

3. Each student should submit two copies of his / her project report for evaluation.

4. Last date for the submission of Project Report:

The project report should be submitted to Department (P.G. Courses) through the Guide **on or before the last working day** for the students of the College for the academic year. If a student fails to submit the project report on or before the last working day, he / she will not be eligible for getting rank.

**FIRST EXTENSION :**

If the student fails to submit the project report within the stipulated time, he / she may be permitted to submit the same one day prior to the date of *viva voce*.

**SECOND EXTENSION :**

If the student fails to submit the project report one day prior to the date of *viva voce* then, he / she may apply for a second extension of three months duration.

The above two extensions may be granted by the Principal based on the written recommendations from the Guide and the Head of the Department.

5. Any other unforeseen problems / situations, not mentioned above if arise regarding the project report and *viva voce*, will be placed in the College Council and suitably resolved.

**External**

**Total – 50 marks**

| <b>Project</b>                                   | <b>Total – 30 marks</b> |
|--------------------------------------------------|-------------------------|
| Relevance of the topic to the academic / society | 05 Marks                |
| Objectives                                       | 05 Marks                |
| Experimental design                              | 10 Marks                |
| Expression of results and discussion             | 10 Marks                |
| <b>Viva Voce</b>                                 | <b>Total – 20 marks</b> |
| Presentation                                     | 10 Marks                |
| Discussion                                       | 10 Marks                |

**Mapping**

| <b>PO/PSO<br/>CO</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PSO1</b> | <b>PSO2</b> |
|----------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| <b>CO1</b>           | H          | H          | H          | H          | H          | H          | M          | H          | H           | H           |
| <b>CO2</b>           | H          | M          | H          | H          | M          | H          | M          | H          | H           | H           |
| <b>CO3</b>           | M          | M          | H          | H          | L          | -          | -          | -          | H           | H           |
| <b>CO4</b>           | H          | H          | H          | H          | H          | H          | H          | H          | H           | H           |

H-High; M-Medium; L-Low

  
**Dr. R. MANICKA CHEZIAN** M.Sc., M.S., Ph.D.,  
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 Nallamuthu Gounder Mahalingam College  
 Pollachi - 642 001, Coimbatore District.