

**CPBFI**



**FINSERV**

# **MEMORANDUM OF UNDERSTANDING**

**BAJAJ FINSERV ACTIVATE**

## MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter referred to as the "MOU") is made and executed on this (Date) 17<sup>th</sup> day of (Month) Jan 2024 at Pune.

BETWEEN

Principal  
PRINCIPAL  
Anandibai Rastane Arts, Commerce & Science College, Vaibhavwadi  
Anandibai Rastane Arts, Commerce & Science College, Vaibhavwadi

a college/Institute/ University recognized by the University Grant Commission under the provisions of UGC Act 1956

and having address at: (Address) At/Post: Vaibhavwadi

Tal: Vaibhavwadi

Dist: Sindhudurg

(City) Sindhudurg

(Pin) 416810

(State) Maharashtra

India

Through its Principal/ Director/ Vice Chancellor/ Registrar/Dean

(hereinafter referred to as "PARTNER INSTITUTE")

AND

**BAJAJ FINSERV LIMITED**, a company registered under the provisions of the Companies Act, 1956, having its registered office at: Bajaj Auto Ltd Complex, Mumbai-Pune Road, Pune 411 035

AND

**BAJAJ FINANCE LIMITED**, a company registered under the provisions of the Companies Act, 1956, having its registered office at: Akurdi, Pune 411 035

Through President (Legal and Taxation) – Bajaj Finserv Limited

(Bajaj Finserv Limited and Bajaj Finance Limited hereinafter referred to as "FINSERV")

The expressions "PARTNER INSTITUTE" and "FINSERV" shall, collectively be referred to as "Parties" and individually as "Party".

WHEREAS:

- A. PARTNER INSTITUTE established in (Year) 11<sup>th</sup> Sept 1992 by (Educational Society/Trust)

महाराणा प्रताप शिक्षण संस्था, मुंबई

is affiliated to (University Name) University of Mumbai

- B. Bajaj Finserv Limited is the holding company for financial services businesses of the Bajaj Group;



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- C. Bajaj Finance Limited is a Non-Banking Finance Company registered with Reserve Bank of India.
- D. FINSERV, as part of its Corporate Social Responsibility (CSR) activities, desires to create employment opportunities for educated youth in the Banking, Finance and Insurance Sector through a customized training programme encompassing product knowledge, communication and other soft skills, which is expected to benefit fresh graduates, especially those belonging to economically weaker sections of the society;
- E. FINSERV, in partnership with some of the leading educational institutes, has designed and developed a customized programme viz. Certificate Programme in Banking, Finance and Insurance (hereinafter referred to as CPBFI).
- E. The PARTNER INSTITUTE has expressed its willingness to partner with FINSERV to conduct CPBFI for its students and alumni, on terms and conditions set out herein below;
- F. FINSERV has accepted the offer of the PARTNER INSTITUTE and agreed to partner with the PARTNER INSTITUTE for conducting CPBFI, on terms and conditions set out below.

NOW THIS AGREEMENT WITNESSETH AND IT IS AGREED BY AND BETWEEN THE PARTIES AS UNDER:

1. Purpose/Objective of CPBFI:

The objective of CPBFI is to impart practical knowledge and essential skills to final year graduation students and fresh graduates, especially those belonging to economically weaker sections of the society, with a view to create employment opportunities for them in the Banking, Finance and Insurance Companies.

2. Scope of CPBFI:

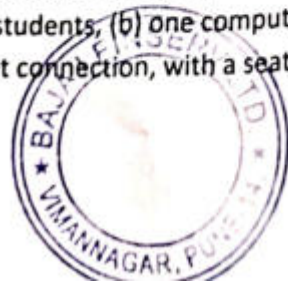
- i. FINSERV has appointed different training institutes as Official Training Partners for conducting CPBFI (hereinafter referred to as CPBFI Official Training Partners).
- ii. FINSERV and the PARTNER INSTITUTE, through one of the CPBFI Official Training Partners, shall conduct, for the eligible students and alumni of the PARTNER INSTITUTE, a Certificate Programme in Banking, Finance and Insurance viz. CPBFI, covering industry overview and product knowledge relevant for roles in banks, NBFCs, life insurance and general insurance companies, communication and other workplace skills. CPBFI shall be conducted through classroom training (hereinafter referred to as CPBFI-CLASSROOM), online training (hereinafter referred to as CPBFI-ONLINE) or a combination of classroom and online training (hereinafter referred to as CPBFI-BLENDED).

3. Responsibilities of the Parties:

- i. The PARTNER INSTITUTE shall be responsible for mobilizing students for the CPBFI Programme by spreading awareness about CPBFI and its potential benefits for the prospective students. FINSERV shall, if requested by PARTNER INSTITUTE, at its discretion, support the awareness campaigns by participating in the student meetings, parent meetings and design of publicity material such as posters, leaflets etc.
- ii. The PARTNER INSTITUTE shall be responsible for providing necessary infrastructure facilities for conducting classroom sessions of CPBFI-CLASSROOM and CPBFI-BLENDED, specifically (a) one class room, equipped with a projector, a sound system and a white-board with a seating capacity of at least 45 students, (b) one computer room, equipped with computers having MS Office software and high-speed internet connection, with a seating



*Signature*





capacity of at least 25 students, for conducting the online assessment tests (c) one assembly hall with a capacity of around 60 persons and 3 interview rooms, for one day per batch, for conducting CPBFI HR Workshop. PARTNER INSTITUTE shall also provide basic stationery required for training purposes such as marker pens, chart sheets, chalks etc.

- iii. The PARTNER INSTITUTE shall appoint a Coordinator for every CPBFI batch, with following responsibilities.
- To motivate and encourage students to extract maximum benefit from CPBFI.
  - To provide necessary support to the CPBFI Official Training Partner for planning and conducting the program.
  - To conduct online pre-assessment and post-assessment tests for every batch.
  - To ensure that the classes are conducted as per pre-defined schedule.
  - To ensure that all students are regularly attending the classes.
  - To maintain daily attendance of students.
  - To attend few classes as an observer and provide feedback to FINSERV about the training quality.
  - To ensure discipline and good conduct from the students.
  - To support FINSERV team to conduct CPBFI HR Workshop for every batch.
  - To submit required college information as per Annexure 3 to FINSERV coordinator.
- iv. The PARTNER INSTITUTE shall issue an appointment letter to the Coordinator as per format prescribed in Annexure 4 of this MOU. The PARTNER INSTITUTE shall submit the appointment letter, duly authorized by the Principal of the PARTNER INSTITUTE and accepted by the Coordinator, to FINSERV before commencement of every CPBFI Batch.
- v. FINSERV shall be responsible to design and continuously improve the CPBFI programme structure, including adding or deleting courses, changing pedagogy or modifications to the programme duration.
- vi. FINSERV shall be responsible to arrange faculty, with requisite expertise and experience, through any of its CPBFI Official Training Partners. FINSERV shall provide necessary details of the concerned CPBFI Official Training Partner to the PARTNER INSTITUTE at least 2 weeks before start of every batch. FINSERV shall be responsible to arrange the online training platform for conducting CPBFI-ONLINE and CPBFI-BLENDED.
- vii. FINSERV and the PARTNER INSTITUTE, shall be responsible for award of "Certificate of Completion" at the completion of CPBFI to all successful candidates who meet eligibility criteria viz. requisite attendance and credits in the examinations conducted during CPBFI.
- viii. FINSERV, as part of its CSR, shall bear the full cost of faculty deployed by its CPBFI Official Training Partner, to ensure that CPBFI is affordable to students belonging to economically weaker sections of the society.
- ix. FINSERV along with its chosen academic partner/s, shall conduct an online examination at the end of CPBFI. Only students who pass this examination and have requisite attendance shall be eligible to receive the "Certificate of Completion". This examination shall be in addition to all other examinations conducted by the CPBFI Official Training Partner during CPBFI.
- x. The PARTNER INSTITUTE shall display the FINSERV name and logo prominently in all marketing and publicity material, notices for students and all other internal and external communications, in paper form or otherwise, relating to CPBFI.
- xi. Any other use of FINSERV brand names by the PARTNER INSTITUTE shall require prior written consent from



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**10. Discipline and right to expel:**

- i. The students of CPBFI-CLASSROOM and CPBFI-BLENDED shall be subject to rules of discipline/code of conduct of the PARTNER INSTITUTE during course period. In case of CPBFI – ONLINE, the students shall be subject to rules of discipline/code of conduct of the CPBFI Official Training Partner.
- ii. If the concerned CPBFI Official Training Partner observes a breach of code of conduct by any student, it shall immediately report the same to the CPBFI Coordinator for necessary action.
- iii. If any participant commits breach of code of conduct of the PARTNER INSTITUTE, the faculty shall have full authority to expel such student for the remaining duration of CPBFI.

**11. Faculty:**

- i. FINSERV shall be solely responsible for arranging, through a CPBFI Official Training Partner, faculty, with requisite industry and teaching experience, and conducting CPBFI efficiently and effectively. The PARTNER INSTITUTE shall not be responsible for making any payments to the faculty of the CPBFI Official Training Partner.
- ii. Some of the lectures of CPBFI may be conducted by the experts from FINSERV as per the understanding between the parties. However, the PARTNER INSTITUTE shall not be liable to pay any amounts to FINSERV towards the said lectures and no amounts shall be deducted from the amounts payable to the PARTNER INSTITUTE.

**12. Certification:**

FINSERV and the PARTNER INSTITUTE shall issue a "Certificate of Completion" in "Certificate Programme in Banking, Finance and Insurance" to the eligible students of CPBFI-CLASSROOM, CPBFI-ONLINE and CPBFI-BLENDED. The certificates shall be designed and printed by FINSERV and shall carry the names of the PARTNER INSTITUTE and the concerned CPBFI Official Training Partner.

**13. Further Agreements:**

The parties agree that, they may mutually discuss and enter into further agreements, if needed.

**14. Confidentiality:**

- i. The Parties agree to maintain strict secrecy and confidentiality regarding any and all Confidential Information exchanged or to be exchanged between them in relation to this MOU.
- ii. The PARTNER INSTITUTE agrees that all the course material provided by FINSERV or the CPBFI Official Training Partner, including but not limited to CPBFI structure, curriculum, lesson plans and evaluation methods, shall be deemed to be Confidential Information.
- iii. The PARTNER INSTITUTE agrees that any of FINSERV's technical or business or other information including information given for development of any case studies / development of any program modules / contents, made available by FINSERV or its personnel to the PARTNER INSTITUTE shall be deemed to be Confidential Information.



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- iv. The PARTNER INSTITUTE agrees to restrict access and disclosure of Confidential Information to such of their employees, agents, vendors, and contractors strictly on a "need to know" basis, to maintain confidentiality of the Information disclosed to it in accordance with this clause.
- v. Information and material disclosed and provided by each party to the other party in pursuance of or in connection with performance of its obligation under this MOU shall, at all times, remain the sole and exclusive property of the disclosing Party.

**15. Intimation about cancellation/postponement of CPBFI:**

- i. If due to any cogent reasons, it appears to the PARTNER INSTITUTE that it is unable to arrange any batch as per schedule, the PARTNER INSTITUTE shall intimate about its inability to FINSERV at least 30 days in advance and the parties shall decide further schedule of CPBFI by mutual consent. FINSERV may decide to complete such batches through online classes.
- ii. However, if such postponement or cancellation is necessitated due to any last minute, unforeseen and unavoidable circumstances like Act of God, civil commotion, strike, bandh, disruption of traffic, epidemic, war, aggression, change in Government Policy or any other similar circumstances, the PARTNER INSTITUTE shall intimate the change in schedule as early as possible after such circumstances as stated above have arisen. In such circumstances, the PARTNER INSTITUTE shall not be held liable for payment towards any loss or damages caused to FINSERV due to delay in its schedule.
- iii. If for any reason, FINSERV, decides to discontinue support for CPBFI, it shall give a written notice to the PARTNER INSTITUTE, 30 days in advance. Such notice shall not impact any batch which is already in progress on the date of notice and the terms of this MOU shall continue to apply to the running batches.

**16. Amendment/Termination:**

- i. Any amendment to the terms of this MOU can only be made by mutual consent of the parties.
- ii. This MOU may be terminated by either party, for breach of terms and conditions of the present MOU or otherwise, by a written notice of at least one (1) month in advance. Such notice of termination shall not interfere with the batches underway at the relevant time. Such batches shall be allowed to continue until their conclusion.
- iii. Both the parties agree that Finserv shall have the right of terminating this MOU without any notice to the PARTNER INSTITUTE, if the PARTNER INSTITUTE charges a fee exceeding the amount prescribed under Clause 6(i) of this MOU. In such event, the batches underway at the relevant time, may also be terminated by FINSERV, unless the PARTNER INSTITUTE refunds the excess fee charged to every student of the batch.

**17. Applicable Law and Dispute Settlement:**

- i. This MOU shall be governed by the Laws of India.
- ii. Any dispute arising between the parties in connection with or arising out of the performance of mutual obligations under this MOU shall be resolved by mutual discussion and consultation. If the dispute remained unresolved even after 30 days, then the dispute shall be referred to the Principal/ Director/ Vice Chancellor/ Registrar/Dean of PARTNER INSTITUTE and Mr. V. Rajagopalan, President (Legal and Taxation), Bajaj Finserv Limited. The decision of the principal/ Director/ Vice Chancellor/ Registrar/Dean of PARTNER INSTITUTE and Mr. Rajagopalan shall be final and binding on both parties.



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18. Originals:

This MOU is executed in counterparts, each of which shall be deemed to be original and retained by each of the Parties but together they shall constitute one and the same MOU.

IN WITNESS WHEREOF, the Parties hereto have put their hands the day, month and the year first hereinabove mentioned.

For  
ANANDIBAI RAORANE ARTS, COMMERCE  
& SCIENCE COLLEGE, VAIBHAVWADI  
Tal-Vaibhavwadi, Dist-Sindhudurg

For Bajaj Finance Limited

For Bajaj Finserv Limited

X  
Sign

Chakrade

V. Rajagopalan

V. Rajagopalan

Dr. Chandrakant Sitaram Chakrade  
Name of Authorized Signatory:

Name: V. Rajagopalan

Name: V. Rajagopalan

PRINCIPAL  
Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi

Designation: \_\_\_\_\_

Designation: Authorized  
Signatory

Designation: President (Legal  
and Taxation)

X  
Sign

MBL

Pallavi Gandhalikar

Pallavi Gandhalikar

Witness

Full Name: Dr. Manohar Ishwara Kumbhar

Witness

Full Name: Pallavi Gandhalikar  
Designation: National Head-  
Corporate Social  
Responsibility

Witness

Full Name: Pallavi Gandhalikar  
Designation: National Head  
Corporate Social Responsibility

Designation:

Head Dept. of Commerce  
ARACS College, Vaibhavwadi.



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### Annexure 1: Format for submission of student information

The PARTNER INSTITUTE shall provide the following information in respect of every student of CPBFI

1. Full Name:
2. Gender:
3. Academic qualification: If already graduate mention the degree. If pursuing graduation, mention the degree for which studying.
4. Status: Mention "Complete" if the candidate is already a graduate. Mention "Pursuing" in case of final year students.
5. Date of Birth: in DD/MM/YYYY format
6. Mobile Number:
7. Email Address:

### Annexure 2: Methodology for Calculating Overall Attendance of the Batch

The steps and formula for calculating overall attendance are as under.

1. Enrollment: Number of students who have registered and paid fees for CPBFI
2. Drop-outs: Number of students who stopped attending CPBFI during the batch
3. Regular students: Enrollment minus Drop Out
4. Total available student days: Number of regular students multiplied by total duration of CPBFI (number of days. E.g. 40 days)
5. Actual student days: Sum of days attended by each regular student.
6. Overall attendance (%) =  $\text{Actual Student Days} / \text{Available Student Days} \times 100$

Example: In a CPBFI batch 43 students registered and paid fees. By end of first week 3 students stopped attending the batch. The batch was conducted for 40 days. Out of the 40 regular students – 10 attended every class, 15 attended for 35 days, 10 attended for 33 days and 5 attended by 30 days. Overall attendance will be calculated as under.

Enrollment: 43

Drop-out: 3

Regular students: 40

Available days:  $40 \times 40$  i.e. 1600

Actual days:  $(10 \times 40) + (15 \times 35) + (10 \times 33) + (5 \times 30) = 400 + 525 + 330 + 150 = 1405$

Overall attendance:  $(1405 / 1600) \times 100 = 87.81\%$



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**Annexure 3: Information required by FINSERV before commencement of every batch**

Sr.	Information Required
1	Basic information about the PARTNER INSTITUTE viz.  Name Year of establishment Name of the educational society Contact details Website URL NAAC rating Total number of students (by stream) Total final year students (by stream)
2	Coordinator Details viz.  Name Designation Department (Commerce/Science etc.) Contact details: Mobile and Email Address
5	Brief write up about the institute – for inclusion on CPBFI website, CV book etc.



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**Annexure 4: Appointment Letter for appointing Coordinator for CPBFI**  
(to be printed on PARTNER INSTITUTE letterhead)

Date: \_\_\_\_\_

To \_\_\_\_\_

(Name of the coordinator)

(Designation of the coordinator)

**Subject: Your appointment as the official coordinator for the Bajaj Finserv CPBFI Programme**

Dear \_\_\_\_\_

I am pleased to inform you that you have been appointed as the official coordinator for conducting Bajaj Finserv's CPBFI Programme in our college. Congratulations!

As official coordinator of the CPBFI programme, you will be responsible for ensuring that the programme is successfully conducted in our college, in accordance with the terms and conditions prescribed in the MOU signed between our institute and Bajaj Finserv Limited and Bajaj Finance Limited. Your specific responsibilities are mentioned in Clause 3(iii) of the said MOU. You will also abide by the other terms of the MOU, specifically those relating to confidentiality of information.

The college will be pay you a consolidated amount of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) for every successful batch of CPBFI, coordinated by you. This amount shall be subject to applicable taxes.

This appointment is valid for the academic year \_\_\_\_\_, subject to satisfactory performance.

Kindly confirm your acceptance to this appointment by signing this letter.

For: (College name)

Authorized signatory

(Name and designation)

I agree to the terms of this appointment letter.

Coordinator

(name and signature)



A handwritten signature in black ink, appearing to be "Chavade", written over a horizontal line.



Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

To

Dear Sir/Madam,

Greetings from Bajaj Finserv!

Please find attached the MOU for partnering with Bajaj Finserv Ltd. for conducting BEYOND CPBFI Program. We request you to follow below instructions and courier the set back to us:

**Instructions for the MOU received by you:**

Sr. No	Instructions	Checklist
1.	Blanks to be filled in writing by the College:	
a)	Pg. No.1: 1. Day and 2. Date	
b)	Pg. No.1: 1. College Name, 2. Address, 3. City, 4. Pin, 5. State.	
c)	Pg. No. 1: 1. Year of establishment 2. Name of Educational Institute/Trust (if applicable, else write NA) 2. Affiliated to the University Name	
d)	Pg. No. 4: Clause 6 Course Fees - 1. CPBFI Fees in figures. 2. CPBFI Fees in words.	
e)	Pg. No. 5: Clause 7 Duration and content of CPBFI (i) 1. Batch Start Month Clause 8 Place of teaching (i) 1. College Name and 2. City	
f)	Pg. No.8 : Clause 17 (ii) 1. Name of Principal/Dean/Registrar/Director etc. of the Institute who is signing the MoU. 2. College Name	
g)	Pg. No. 8 : Signatories' information 1. College Name 2. Principal Name 3. Witness Name 4. Witness Designation.	
2.	The College should affix round seal/stamp on every Page. Institute Head should sign next to the seal also on every Page.	
3.	Both Head of Institute and Witness should sign on the allotted space on Page no. 8	
4.	Kindly do not fill anything in the attached Annexures. They are for reference purpose only.	

Please do the needful mentioned above and courier us the MoU set back on below address:

To

Archana Bhat,  
6<sup>th</sup> Floor, Bajaj Finserv Corporate Office,  
Off Pune Ahmednagar Road,  
Viman Nagar, Pune-411 014

**\*\*Please Note:** Bajaj will sign the MoU once the first batch is launched and courier back the College Copy. Bajaj signs only after the first batch launch as we do not wish to have any inactive MoUs.

Looking forward to a very successful partnership in making the Students employable.

Thanks and Regards,

Archana Bhat  
BEYOND CPBFI-College Partnership  
Bajaj Finserv Ltd.  
( [archana.bhat@bajajfinserv.in](mailto:archana.bhat@bajajfinserv.in) ; 9923799856 )



*Skatade*





Maharana Pratapsinh Shikshan Sanstha's  
**ANANDIBAI RAORANE ARTS, COMMERCE &  
SCIENCE COLLEGE, VAIBHAVWADI**

At/Post/Tal:- Vaibhavwadi, Dist-Sindhudurg, Pin-416810

REACCREDITED "A" GRADE BY NAAC 2021:2026 WITH 3.08 CGPA

BEST COLLEGE AWARD 2020-21, ISO 9001:2015 CER. NO. 19ZOCK02493Q

Web :- [www.anandivaibhav.in](http://www.anandivaibhav.in)

E-mail: [aracscollge@gmail.com](mailto:aracscollge@gmail.com)

PRINCIPAL: **Dr. C.S. KAKADE** (M. Sc. Ph. D. D.C.O.)

Mob: 9850960026

जा.क्र.:-- आराकवाविमवे/ CPBFI 1464 /2023-24

दिनांक :- 17-01-2024

To  
Prof., Ranjit Bhauso Patil  
Assistant Professor of Accountancy

Subject: Your appointment as the official coordinator for the Bajaj FinServ CPBFI Programme

Dear Sir

I am pleased to inform you that you have been appointed as the official coordinator for conducting Bajaj Finserv's CPBFI Programme in our college. Congratulations!

As official coordinator of the programme, you will be responsible for ensuring that the programme is successfully conducted in our college, in accordance with the terms and conditions prescribed in the MOU signed between our institute and Bajaj Finserv Limited and Bajaj Finance Limited. Your specific responsibilities are mentioned in Clause 3(iii) of the said MOU. You will also abide by the other terms of the MOU, specifically those relating to confidentiality of information.

The college will be pay you a consolidated amount of Rs. 2000/- (Rupees Two Thousand only) for every successful batch of CPBFI, coordinated by you. This amount shall be subject to applicable taxes.

This appointment is valid for the academic year 2023 -24 subject to satisfactory performance.

Kindly confirm your acceptance of this appointment by signing this letter.

For: (College name)

Authorized signatory

Dr. Chandrakant Sitaram Kakade

PRINCIPAL

Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi

I agree to the terms of this appointment letter.

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Coordinator

Prof., Ranjit Bhauso Patil

Assistant Professor of Accountancy

9822252658



**MEMORANDUM OF UNDERSTANDING  
BETWEEN  
DEPARTMENT OF HISTORY  
SHRI. MANOHAR HARI KHAPANE COLLEGE OF ARTS &  
COMMERCE PACHAL  
AND  
DEPARTMENT OF HISTORY  
ANANDIBAI RAORANE COLLEGE OF ARTS, COMMERCE AND  
SCIENCE VAIBHAVWADI  
FOR THE DEVELOPMENT IF ACADEMIC COOPERATION  
IN UNDERGRADUATE EDUCATION**

The general objective of this Memorandum of Understanding (MOU) is to stimulate and facilitate the development of collaborative and mutually beneficial programs which serve to enhance the intellectual life and educational development on both campuses. Thus, the Department of History of Shri. Manohar Hari Khapane college Pachal and the Department of History of Anandibai Raorane College of Arts, Commerce and Science Vaibhavwadi have agreed that in support of their mutual interests in the field of education and research as under :

1. The two Educational departments will :
  - a. Co-operate in the exchange of information relating to their activities in teaching in the fields of higher education,
  - b. Promote joint courses of study with the exchange of faculties,
  - c. The exchange of students will be dependent on the execution of a formal Student Exchange Agreement prior to commencement of this activity,
  - d. Conduct short courses, as mutually agreed in writing between the parties prior to commencement of this activity,
  - e. Conduct study tours, a mutually agreed in writing between the parties prior to commencement of this activity.

The aim of the Memorandum of Understanding shall be to achieve a broad balance in the respective contributions and benefits of the collaboration, and this shall be subject to periodic review by both the colleges.

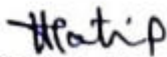
The host institution agrees to assist in the seeking of suitable work space, library and technical facilities as appropriate.

This agreement will take effect from the date of its signing and shall be valid for and unlimited period from that date unless sooner terminated, revoked or modified by mutual written agreement between both parties, and may be extended by mutual written agreement.

Either party may terminate the Agreement at any time during tile term by the provision of three months written notice to the other party.

### SIGNATURES

Signed to, and on behalf of



Dr. Ashok D. Patil

Head, Dept. of History

Shri. M. H. Khapane College Pachal

Signed to, and on behalf of



Prof. Suresh N. Patil

Head, Dept. of History

Anandibai Raorane College Vaibhavwadi



Dr. K. M. Kotwal

Principal

Shri. M. H. Khapane College Pachal

PRINCIPAL

SHRI. MANOHAR HARI KHAPANE

COLLEGE OF ARTS & COM., PACHAL

W/2 Ravpatan Tal. Rajapur Dist. Ratnagiri - 419



Dr. C. S. Kakade

Principal

Anandibai Raorane College Vaibhavwadi

Principal

Anandibai Raorane Arts, Commerce  
& Science, College, Vaibhavwadi

Date : 12/12/2019

Date : 12/12/2019

Seal of the College



Seal of the College





## Memorandum of Understanding

Between

MAHARANA PRATAPSIKH SHIKSHAN SANSTHA MUMBAI  
**ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE  
COLLEGE, VAIBHAVWADI,**  
A/P-Tal- Vaibhavwadi, Dist.- Sindhudurg, Maharashtra – 416810

&

**PHARMACEUTICAL QUALITY SCIENTISTS (PQS)  
TRAINING LABORATORY**

Plot no # 1 -42 1<sup>st</sup> floor, above State Bank of India

Verna industrial Estate Verna Goa - 403722



## Memorandum of Understanding

Between

**MAHARANA PRATAPSIKH SHIKSHAN SANSTHA MUMBAI  
ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE  
COLLEGE, VAIBHAVWADI,  
A/P-Tal- Vaibhavwadi, Dist.- Sindhudurg, Maharashtra - 416810**



&

**PHARMACEUTICAL QUALITY SCIENTISTS (PQS) TRAINING  
LABORATORY**

Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India  
Verna Industrial Estate Verna, Goa - 403722

This memorandum of understanding (herein after referred to as MOU) is made on this 28<sup>th</sup> Day of September 2021 between Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.- Sindhudurg, Maharashtra - 416810 and Pharmaceutical Quality Scientists Training Laboratory Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India Verna Industrial Estate Verna, Goa - 403722 (Part 2)

Whereas

- A. Maharana Pratapsinh Shikshan Sanstha Mumbai's, Anandibai Raorane Arts, Commerce & Science College, Vaibhavwadi, Dist- Sindhudurg established in 1992 is one of the premier college in Sindhudurg district. Since inception, it has been working with a vision providing quality higher education to rural students, empowering them to cope up with the competitive world.  
It is one of the leading & heritage educational institutions and grant-in-aid college (Government of Maharashtra) affiliated to University of Mumbai. College has not only grown in strength & size but also in levels of excellence. College is accredited by NAAC in February, 2021 and secured 'A' Grade (CGPA-3.08) in 3<sup>rd</sup> cycle.
- B. Pharmaceutical Quality Scientists Training Laboratory Verna Goa is partnership firm involved in various quality related services to pharma as well as involved in industry ready skill set development programs for pharma job seekers within quality sections.
- C. Both the parties would like to enter into this MOU for industrial institute interaction and to establish a basis of cooperation and collaboration between the parties upon the terms as contained herein.



## Memorandum of Understanding



### 1. Area of Co-operation

The parties agree to carry out collaborative efforts in the areas of:

- a) Collaborative research and project work.
- b) Industrial training and sponsored project for UG/PG students.
- c) Join organisation of workshop and seminars on the topics of common interest.
- d) Guidance and cooperation to Training & Placement activities.
- e) Consultancy and exchange of knowhow on charge basis.
- f) Mutual cooperation in development work
- g) Extending the help and mediation for any other collaboration in the educational and technology area on charge basis.
- h) Any other areas of co-operation as agreed to by the parties from time to time.

The parties to this MOU agree to continue discussions and communication on the areas as identified in sub-clause 1.1 in respect of their implementation and in identifying each party's responsibility and interest.

### 2. Duration and Termination

This MOU shall remain in effect for 5 (Five) years from the effective date or until terminated by either party with thirty (30) days written notice.

This MOU may be extended for a further period as may be agreed in writing by the parties.

### 3. Financial Agreement

This MOU shall not give any financial obligation. There should not be cost and expensive involved for the implementation of this MOU except mutually agreed cost for some items as stated in sub clause 1.1.

### 4. Confidentiality

Each party shall undertake to observe the secrecy of confidential information received from or supplied to the other party during the period of implementation of this MOU or other agreement made pursuant to this MOU. For purpose of this MOU "Confidential Information" means any information whether prior to or hereinafter disclosed by a party ( the disclosing party ) to the other party ( the receiving party ) of this MoU involving technical , business, marketing , policy, known-how planning , project management and other information, data and / or solution in any form, including but not limited to any information which is designated in writing to be confidential or by its nature intended to be for the knowledge of the receiving party or if orally given, is given in the circumstances of confidence.

Both parties agree that the provision of this clause shall to be binding between the parties notwithstanding the termination of this MOU.



## Memorandum of Understanding

### 5. Settlement of disputes.

Any difference or dispute between the parties censoring the interpretation and / or implementation and / or application of any of the provisions of the MOU shall first be settled amicably through mutual consultations and / or negotiations between the parties.

### 6. Non contractual nature of relationship

Save for clause 4 the parties agree that this MOU represent the mutual understanding of the parties and is not intended nor shall be deemed to be a contract and shall not give rise to any rights and liabilities under a contract.

Nothing contained herein shall be construed so as to constitute a joint venture partnership or formal business organization of any kind between the parties or so to constitute either party as the agent of the other.

The parties acknowledge that this MOU does not in any way give rise to any right or permission to use or to be associated with each party's intellectual property.

### 7. Revision , Variation and Amendment

Either party may request in writing a revision variation or amendment of this MOU. Any such revision, variation or amendment agreed to by the parties shall be in writing and shall form part of this MOU. Such revision, variation or amendment shall be come into force on such date as may be determined by the parties.

Any revision or amendment shall not prejudice the implementation of any project, activity or co-operation arising from or based on this MOU before or up to the date of such revision, variation or amendment.

### 8. Supervising Events

8.1 Each party reserves the right for reasons of national security, national interests, and public health to suspend temporarily, either in whole in part the implementation of this MOU which suspension shall take effect immediately after notification has been given to the other party.

8.2 Notwithstanding sub-clause 8.1 should any other event occur which hinders or restrict the implementation of this MOU the parties shall use their best endeavour to agree upon such action as may be necessary and equitable to remove the cause of such event.

### 9. Notice

Every notice request or any other communication required or permitted to be given pursuant to this MOU shall be in writing and delivered personally or sent by registered or certified post or via air mail or via courier or facsimile or by e-mail (which shall be acknowledged by the other party) to the parties at their address and facsimile number as stated below.





## Memorandum of Understanding

### Party No 1

To : Name : Prin. Dr. C. S. Kakade  
E-mail Id : [aracscollge@gmail.com](mailto:aracscollge@gmail.com) / [cskvng@yahoo.co.in](mailto:cskvng@yahoo.co.in)  
Cell No : 9850960026  
Address: Anandibai Raorane Arts, Commerce and Science College,  
Vaibhavwadi, Dist.-Sindhudurg, Maharashtra - 416810

### Party No 2

To : Name : Mr Mahesh Rao  
E-mail Id : [pqs.traininglab@gmail.com](mailto:pqs.traininglab@gmail.com)  
Cell No : 9764221099  
Address: PQS TRAINING LABORATORY  
Plot no # 1 -42 1<sup>st</sup> flowers, Above State Bank of India  
Verna industrial Estate Verna, Goa - 403722

In witness thereof the two parties have caused this MOU to be extended by their duly authorized representative.

Principal

Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi.

Anandibai Raorane Arts, Commerce and  
Science College, Vaibhavwadi,  
Dist.-Sindhudurg, Maharashtra - 416810



For Proprietor,



PQS TRAINING LABORATORY  
Plot no # 1 -42 1<sup>st</sup> flowers, Above  
State Bank of India Verna Industrial  
Estate Verna, Goa - 403722



**Maharana Pratapsinh Shikshan Sanstha's**  
**ANANDIBAI RAORANE ARTS, COMMERCE**  
**& SCIENCE COLLEGE, VAIBHAVWADI**

REACCREDITED "A" GRADE BY NAAC 2021:2026 WITH 3.08 CGPA

ISO 9001 : 2015 CER. NO. 19ZOCK02493Q

Web :- anandivaibhav.in

E-mail: aracscollege@gmail.com

PRINCIPAL: **Dr. C.S. KAKADE** (M. Sc. Ph. D. D.C.O.)

Mob: 9850960026

जा.क्र.: - आराकवाविमवे/MOU / 112 / 2021-22

दिनांक :- 28.09.2021

## Memorandum of Understanding



Between

MAHARANA PRATAPSIKH SHIKSHAN SANSTHA MUMBAI  
**ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE**  
**COLLEGE, VAIBHAVWADI,**

A/P-Tal- Vaibhavwadi, Dist.- Sindhudurg, Maharashtra – 416810

&

**PHARMACEUTICAL QUALITY SCIENTISTS (PQS)**  
**TRAINING LABORATORY**

Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India

Verna industrial Estate Verna Goa - 403722



# Memorandum of Understanding

Between

MAHARANA PRATAPSIKH SHIKSHAN SANSTHA MUMBAI  
ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE  
COLLEGE, VAIBHAVWADI,  
A/P-Tal- Vaibhavwadi, Dist.- Sindhudurg, Maharashtra - 416810



&

## PHARMACEUTICAL QUALITY SCIENTISTS (PQS) TRAINING LABORATORY

Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India  
Verna Industrial Estate Verna, Goa - 403722

-----

This memorandum of understanding (herein after referred to as MOU) is made on this 28<sup>th</sup> Day of September 2021 between Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.- Sindhudurg, Maharashtra - 416810 and Pharmaceutical Quality Scientists Training Laboratory Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India Verna Industrial Estate Verna, Goa – 403722 (Part 2)

Whereas

A. Maharana Pratapsinh Shikshan Sanstha Mumbai's, Anandibai Raorane Arts, Commerce & Science College, Vaibhavwadi, Dist- Sindhudurg established in 1992 is one of the premier college in Sindhudurg district. Since inception, it has been working with a vision providing quality higher education to rural students, empowering them to cope up with the competitive world.

It is one of the leading & heritage educational institutions and grant-in-aid college (Government of Maharashtra) affiliated to University of Mumbai. College has not only grown in strength & size but also in levels of excellence. College is accredited by NAAC in February, 2021 and secured 'A' Grade (CGPA-3.08) in 3<sup>rd</sup> cycle.

- B. Pharmaceutical Quality Scientists Training Laboratory Verna Goa is partnership firm involved in various quality related services to pharma as well as involved in industry ready skill set development programs for pharma job seekers within quality sections.
- C. Both the parties would like to enter into this MOU for industrial institute interaction and to establish a basis of cooperation and collaboration between the parties upon the terms as contained herein.

# Memorandum of Understanding



## 1. Area of Co-operation

The parties agree to carry out collaborative efforts in the areas of:

- a) Collaborative research and project work.
- b) Industrial training and sponsored project for UG/PG students.
- c) Join organisation of workshop and seminars on the topics of common interest.
- d) Guidance and cooperation to Training & Placement activities.
- e) Consultancy and exchange of knowhow on charge basis.
- f) Mutual cooperation in development work
- g) Extending the help and mediation for any other collaboration in the educational and technology area on charge basis.
- h) Any other areas of co-operation as agreed to by the parties from time to time.

The parties to this MOU agree to continue discussions and communication on the areas as identified in sub-clause 1.1 in respect of their implementation and in identifying each party's responsibility and interest.

## 2. Duration and Termination

This MOU shall remain in effect for 5 (Five) years from the effective date or until terminated by either party with thirty (30) days written notice.

This MOU may be extended for a further period as may be agreed in writing by the parties.

## 3. Financial Agreement

This MOU shall not give any financial obligation. There should not be cost and expensive involved for the implementation of this MOU except mutually agreed cost for some items as stated in sub clause 1.1.

## 4. Confidentiality

Each party shall undertake to observe the secrecy of confidential information received from or supplied to the other party during the period of implementation of this MOU or other agreement made pursuant to this MOU. For purpose of this MOU "Confidential Information" means any information whether prior to or hereinafter disclosed by a party ( the disclosing party ) to the other party ( the receiving party ) of this MoU involving technical , business, marketing , policy, known-how planning , project management and other information, data and / or solution in any form, including but not limited to any information which is designated in writing to be confidential or by its nature intended to be for the knowledge of the receiving party or if orally given, is given in the circumstances of confidence.

Both parties agree that the provision of this clause shall to be binding between the parties notwithstanding the termination of this MOU.





## Memorandum of Understanding

### 5. Settlement of disputes.

Any difference or dispute between the parties censoring the interpretation and / or implementation and / or application of any of the provisions of the MOU shall first be settled amicably through mutual consultations and / or negotiations between the parties.

### 6. Non contractual nature of relationship

Save for clause 4 the parties agree that this MOU represent the mutual understanding of the parties and is not intended nor shall be deemed to be a contract and shall not give rise to any rights and liabilities under a contract.

Nothing contained herein shall be construed so as to constitute a joint venture partnership or formal business organization of any kind between the parties or so to constitute either party as the agent of the other.

The parties acknowledge that this MOU does not in any way give rise to any right or permission to use or to be associated with each party's intellectual property.

### 7. Revision , Variation and Amendment

Either party may request in writing a revision variation or amendment of this MOU. Any such revision, variation or amendment agreed to by the parties shall be in writing and shall form part of this MOU. Such revision, variation or amendment shall be come into force on such date as may be determined by the parties.

Any revision or amendment shall not prejudice the implementation of any project, activity or co-operation arising from or based on this MOU before or up to the date of such revision, variation or amendment.

### 8. Supervising Events

8.1 Each party reserves the right for reasons of national security, national interests, and public health to suspend temporarily, either in whole in part the implementation of this MOU which suspension shall take effect immediately after notification has been given to the other party.

8.2 Notwithstanding sub-clause 8.1 should any other event occur which hinders or restrict the implementation of this MOU the parties shall use their best endeavour to agree upon such action as may be necessary and equitable to remove the cause of such event.

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## Memorandum of Understanding

### Party No 1

To : Name : Prin. Dr. C. S. Kakade

E-mail Id : [aracscollege@gmail.com](mailto:aracscollege@gmail.com) / [cskvng@yahoo.co.in](mailto:cskvng@yahoo.co.in)

Cell No : 9850960026

Address: Anandibai Raorane Arts, Commerce and Science College,  
Vaibhavwadi, Dist.-Sindhudurg, Maharashtra - 416810

### Party No 2

To : Name : Mr Mahesh Rao

E-mail Id: [pqs.traininglab@gmail.com](mailto:pqs.traininglab@gmail.com)

Cell No: 9764221099

Address: PQS TRAING LABORATORY

Plot no # 1 -42 1<sup>st</sup> flowers, Above State Bank of India  
Verna industrial Estate Verna, Goa - 403722

In witness thereof the two parties have caused this MOU to be extended by their duly authorized representative.



Principal

Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi.



For Principal,

Anandibai Raorane Arts, Commerce and  
Science College, Vaibhavwadi,  
Dist.-Sindhudurg, Maharashtra - 416810



PQS Training Laboratory



For Proprietor,

PQS TRAING LABORATORY  
Plot no # 1 -42 1<sup>st</sup> flowers, Above  
State Bank of India Verna Industrial  
Estate Verna, Goa - 403722



# Memorandum of Understanding

MAHARANA PRATAPSIKH SHIKSHAN SANSTHA MUMBAI  
ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE  
COLLEGE, VAIBHAVWADI,

A/P-Tal- Vaibhavwadi, Dist.- Sindhudurg, Maharashtra – 416810

&

PHARMACEUTICAL QUALITY SCIENTISTS (PQS)  
TRAINING LABORATORY

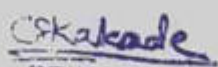
Plot no # 1 -42 1<sup>st</sup> flowers, above State Bank of India

Verna industrial Estate Verna Goa - 403722



  
**IQAC COORDINATOR**  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi

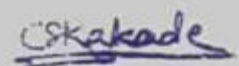


  
**PRINCIPAL**  
Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi



  
**IQAC COORDINATOR**  
 Anandibai Raorane Arts, Comm. &  
 Science College, Vaibhavwadi



  
**PRINCIPAL**  
 Anandibai Raorane Arts, Commerce  
 & Science College, Vaibhavwadi



# **“Iodine Mediated Synthesis of 1, 3, 4-Oxadiazoles”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.  
Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated to University of Mumbai)**

**NAAC Re-Accredited with ‘A’ grade (CGPA: 3.08), ISO 9001:2005 Certified**

**Best College Award by University of Mumbai (Rural)**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**Mr. Rushikesh Vilas Chougale**

**Under the Guidance of**

**Dr. D. M. Sirsat**

**M.Sc., Ph.D., SET, NET**

**Head, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi  
District - Sindhudurg, Maharashtra-416810**

**May - 2024**

## CERTIFICATE

This is certify that, **Mr. Rushikesh Vilas Chougale**, has performed work on the project entitled **"Iodine Mediated Synthesis of 1, 3, 4-Oxadiazoles"** for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2023-24 satisfactory. The work is original and has not been submitted for the award of any Diploma or Degree of this or any other University.

It is also stated that the contents of this project represent independent work of **Mr. Rushikesh Vilas Chougale** and the all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Head, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhurg, Maharashtra-416810.

Place – Vaibhavwadi

Date –

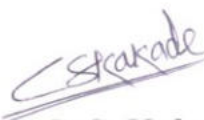


**Dr. D. M. Sirsat**

Project Guide



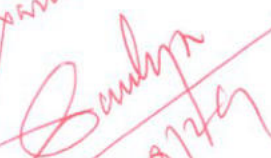
**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi



**Dr. C. S. Kakade**  
Principal

Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi.



Examined  
  
02/08/24



# **“Synthesis of indolyl imidazoles using PEG-400 as a recyclable reaction medium at room temperature”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.**

**Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated to University of Mumbai)**

**NAAC Re-Accredited with ‘A’ grade (CGPA: 3.08), ISO 9001:2005 Certified**

**Best College Award by University of Mumbai (Rural)**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**Mr. Rushikesh Maruti Chougale**

**Under the Guidance of**

**Dr. D. M. Sirsat**

**M.Sc., Ph.D., SET, NET**

**Head, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi**

**District - Sindhudurg, Maharashtra-416810**

**May - 2024**

## CERTIFICATE

This is certify that, **Mr. Rushikesh Maruti Chougale**, has performed work on the project entitled **"Synthesis of indolyl imidazoles using PEG-400 as a recyclable reaction medium at room temperature"** for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2023-24 satisfactory. The work is original and has not been submitted for the award of any Diploma or Degree of this or any other University.

It is also stated that the contents of this project represent independent work of **Mr. Rushikesh Maruti Chougale** and the all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Head, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhurg, Maharashtra-416810.

Place – Vaibhavwadi

Date –



**Dr. D. M. Sirsat**  
Project Guide



**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry  
Anandibai Raorane Arts, Commerce &  
Science College, Vaibhavwadi



**Dr. C. S. Kakade**  
Principal  
Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi





# **“GREEN SYNTHESIS OF ZnO NANOPARTICLES AS A PHOTOCATALYST FOR METHYL ORANGE DYE DEGRADATION”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.  
Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated to University of Mumbai)**

**NAAC Re-Accredited with ‘A’ grade (CGPA: 3.08), ISO 9001:2005 Certified**

**Best College Award by University of Mumbai (Rural)**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**Mr. Sahil Liyakat Batwale**

**Under the Guidance of**

**Dr. D. M. Sirsat**

**M.Sc., Ph.D., SET, NET**

**Head, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi  
District - Sindhudurg, Maharashtra-416810**

**May - 2024**

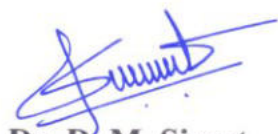
## CERTIFICATE

This is certify that, **Mr. Sahil Liyakat Batwale**, has performed work on the project entitled **"GREEN SYNTHESIS OF ZnO NANOPARTICALES AS A PHOTOCATALYST FOR METHYL ORANGE DYE DEGRADATION"** for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2021-22 satisfactory. The work is original and has not been submitted for the award of any Diploma or Degree of this or any other University.


It is also stated that the contents of this project represent independent work of **Mr. Sahil Liyakat Batwale** and the all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Head, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhusurg, Maharashtra-416810.

Place – Vaibhavwadi

Date –



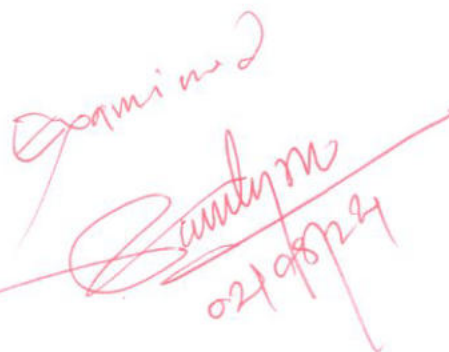
**Dr. D. M. Sirsat**  
Project Guide



**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi



**Dr. C. S. Kakade**  
Principal  
Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi.



02/08/24



# **“One pot synthesis of 1, 2, 3-triazole derivatives via click chemistry approach and their antibacterial activity”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.**

**Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated to University of Mumbai)**

**NAAC Re-Accredited with 'A' grade (CGPA: 3.08), ISO 9001:2005 Certified**

**Best College Award by University of Mumbai (Rural)**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**Mr. Paresh Mukund Chavan**

**Under the Guidance of**

**Dr. D. M. Sirsat**

**M.Sc., Ph.D., SET, NET**

**Head, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi**

**District - Sindhudurg, Maharashtra-416810**

**May - 2024**

## CERTIFICATE

This is certify that, **Mr. Paresh Mukund Chavan**, has performed work on the project entitled **"One pot synthesis of 1, 2, 3-triazole derivatives via click chemistry approach and their antibacterial activity"** for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2021-22 satisfactory. The work is original and has not been submitted for the award of any Diploma or Degree of this or any other University.

It is also stated that the contents of this project represent independent work of **Mr. Paresh Mukund Chavan** and the all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Head, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhusurg, Maharashtra-416810.

Place – Vaibhavwadi

Date –



**Dr. D. M. Sirsat**  
Project Guide



**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry,  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi



**Dr. C. S. Kakade**  
Principal  
Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi



*Examiners*  
*Sunil Kumar*  
*03/09/24*



# **“Synthetic Studies and Reactions of Imidazo [1, 2-a] Pyridine”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.**

**Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated with the University of Mumbai)**

**NAAC Re-Accredited with ‘A’ grade (CGPA: 3.08), ISO 9001:2005 Certified**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**MISS. AAYRE POOJA RAVINDRA**

**Under the Guidance of**

**DR. D. M. SIRSAT**

**M.Sc., Ph.D., SET, NET**

**Assistant Professor, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi**

**District - Sindhudurg, Maharashtra-416810**

**2023 -24**

## CERTIFICATE

This is to certify that, **Miss. Aayre Pooja Ravindra**, has performed work on the project entitled “**Synthetic Studies and Reactions of Imidazo [1, 2-a] Pyridine**” for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2023-24 satisfactory. This team work is original and has not been submitted for the award of any Diploma or Degree from this or any other University.

It is also stated that the contents of this project represent the independent work of **Miss. Aayre Pooja Ravindra** and all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Assistant Professor, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhurg, Maharashtra-416810.

Place – Vaibhavwadi

Date –



**Dr. D. M. Sirsat**  
(Project Guide)



**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry  
(Head of Department)  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi



**Dr. C. S. Kakade**  
Principal  
(Principal)  
Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi.





# **“Thiourea dioxide (TUD) catalyzed synthesis of dihydropyrano [2,3-c] pyrazole derivatives”**

**A project submitted to**

**Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist.**

**Sindhudurg, Maharashtra-416810**

**(Permanently Affiliated to University of Mumbai)**

**NAAC Re-Accredited with ‘A’ grade (CGPA: 3.08), ISO 9001:2005 Certified**

**Best College Award by University of Mumbai (Rural)**



**For the partial fulfillment of**

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

**Under the Faculty of Science**

**By**

**Mr. Mayur Maruti Desai**

**Under the Guidance of**

**Dr. D. M. Sirsat**

**M.Sc., Ph.D., SET, NET**

**Head, Department of Chemistry**

**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi**

**District - Sindhudurg, Maharashtra-416810**

**May - 2024**


## CERTIFICATE

This is certify that, **Mr. Mayur Maruti Desai**, has performed work on the project entitled **“Thiourea dioxide (TUD) catalyzed synthesis of dihydropyrano [2,3-c] pyrazole derivatives”** for the partial fulfillment of the requirement of the degree of Master of Science in Subject Chemistry for the academic year 2023-24 satisfactory. The work is original and has not been submitted for the award of any Diploma or Degree of this or any other University.


It is also stated that the contents of this project represent independent work of **Mr. Mayur Maruti Desai** and the all experiments were done by the candidate himself under project guide **Dr. D. M. Sirsat**, Head, Department of Chemistry, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, District – Sindhururg, Maharashtra-416810.

Place – Vaibhavwadi

Date –

  
**Dr. D. M. Sirsat**  
Project Guide

  
**Dr. D. M. Sirsat**  
Head, Dept. of Chemistry  
Anandibai Raorane Arts, Comm. &  
Science College, Vaibhavwadi

  
**Dr. C. S. Kakade**  
Principal  
Anandibai Raorane Arts, Commerce & Science  
College, Vaibhavwadi







# **"STUDY OF STRENGTH & WEAKNESS OF SELF HELP GROUP"**

A Project Report submitted to The University of Mumbai for  
partial completion of the degree of master in commerce

Under the faculty of commerce.

**MAHARANA PRATAP SHIKSHAN SANSTHA  
ANANDIBAI RAORANE ARTS, COMMERCE & SCIENCE  
COLLEGE, VAIBHAVWADI**

**M.Com-II**

**Year-2023-24**

By

**Miss :- Hawaldar Swaliya Ismail**

Exam seat No.6545941

Guide

Ass.Prof.R.A.Bhosle

Head Deptt.of Commerce,

Anandibai raorane Senior College, Vaibhavwadi

Dist. Sindhudurg : 416810.



## DECLARATION


I the undersigned **Miss Swaliya Ismail Hawaldar** here by declare that the work embodied in this project work titled 'A STUDY OF STRENGTH AND WEKNESS OF SELF HELP GROUP''.

Forms my own contribution to the research work carried out under the guidance of Prof. R. A.Bhosale . It is my own research work and has not ben previously submitted to any other university for any other diploma or degree.

Wherever reference has been taken from previous works pf others , it has ben clearly indicates as suchand included in the bibliography.

I, here by further declare that all information of this document has ben obtained and presented on According with academic rules and ethical conduct.

Certified by

  
Prof. R. A. Bhosale.



[ Miss . Swaliya Ismail Hawaldar.





**MAHARANA PRATAP SHIKSHAN SANSTHAN**  
**ANANDIBAI RAORANE ARTS, COMMERCE & SCIENCE COLLEGE,**  
**VAIBHAVWADI.**

**CERTIFICATE**

This is to certify that **Miss. Hawaldar Swaliya Ismail.** has Worked and duly completed his project work for the degree of Master in Commerce under the Faculty of Accountancy in the subject of Project Work. An area of study is "**A STUDY OF STRENGTH & WEAKNESSE OF SELF-HELP GROUPS**".

Under my supervision. I further certify that the entire work has been done by the learner under my guidance and that no part of it has been submitted previously for any degree or diploma of any University.


It is her/ his own work and facts, findings and recommendations reported by her/him.

12/01/2024  
Date of Submission:

  
Prof. R. A. Bhosale

(Subject Incharge)

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER  
(Dr. M. D. Kumbhar)



  
PRINCIPAL  
PRINCIPAL  
Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi

## COLLEGE NAME

Anandibai Raorane Arts, Commerce And  
Science College Vaibhavwadi.

## NAME OF THE STUDENTS

Kiran Abaso Deshmukh.

CLASS – M.COM – II

## TOPIC FOR RESEARCH PROJECTS

EFFECTS OF MANAGEMENT ON FINANCIAL PERFORMANCE OF CO-  
OP.BANK (CASE STUDY)

## NAME OF THE GUIDE

Mr.R.A.BHOSALE SIR .

YEAR-2023/24





## ACKNOWLEDGEMENT

To list who all have helped me is difficult because they are so numerous and The depth is so enormous. I would like to acknowledge the following as being Idealistic chanel and fresh dimenision in the completion of this project I take this opportunity to thank the **University Of Mumbai** for giving me Chance to do this project.

I would like to thank my **Hon.principal Dr.C.S.Kakade** providing the Necessary facilities required for completion of this project.

I take this opportunity to thank our co ordinator of the program **Dr. M.I.Kumbhar** for his moral support and guidance . I would also like to express my sincere gratitude towards.

My project guide **Prof.R.A.Bhosale** whose guidance and care made the Project successful.

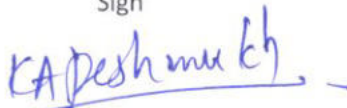
I would like thank to my **collage library** for having provided various Reference books and magazines related to my project.

Lastly, I would like to thank each and every person who directly or indirectly Helped me in the completion of the project especially **my parents and peers** Who supported me throuth my project.

Date: 12/12/2023

Place Vaibhavwadi

Sign



(Mr. Kiran Abaso Deshmukh.)



**MAHARANA PRATAP SHIKSHAN SANSTHAN**  
**ANANDIBAI RAORANE ARTS, COMMERCE & SCIENCE COLLEGE,**  
**VAIBHAVWADI.**

**CERTIFICATE**

This is to certify that **Mr. Kiran Abaso Deshmukh** has Worked and duly completed his project work for the degree of Master in Commerce under the Faculty of Accountancy in the subject of Project Work. An area of study is **"Effects of Management on Financial Performance of Co-operative Bank (Case study)"**.

Under my supervision. I further certify that the entire work has been done by the learner under my guidance and that no part of it has been submitted previously for any degree or diploma of any University.

It is her/ his own work and facts, findings and recommendations reported by her/him.

12/01/2024  
Date of Submission:



Prof. R. A. Bhosale

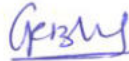
(Subject Incharge)





PRINCIPAL

Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi



INTERNAL EXAMINER



EXTERNAL EXAMINER

(Dr. M. E. Kumbhar)





AC – 07/07/2023  
Item No. – 6.12 (N)

## As Per NEP 2020

### University of Mumbai



#### Title of the program

- |   |   |                |
|---|---|----------------|
| A- P.G. Diploma in Organic Chemistry      | } | <b>2023-24</b> |
| B- M.Sc. (Organic Chemistry) (Two Year)   |   |                |
| C- M.Sc. (Organic Chemistry) (One Year) - |   |                |

#### Syllabus for the Semester – Sem I & II

Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG

*Celakade*  
PRINCIPAL

Anandibai Rastogi Arts, Commerce  
& Science College, Valbhavwadi



## Preamble

### 1) Introduction

This program is designed to provide a comprehensive and in-depth understanding of the fascinating world of Organic chemistry. Through a rigorous academic curriculum and hands-on research experience, we aim to nurture the intellectual curiosity and scientific acumen of our students, preparing them for successful careers in various sectors of the chemical sciences. The M.Sc. (Organic Chemistry) course is structured to equip students with a strong theoretical foundation, practical skills, and critical thinking abilities necessary to address the challenges and opportunities in the diverse fields of chemistry. Our esteemed faculty members are experts in their respective fields, with a passion for both teaching and research. They are committed to providing a nurturing learning environment, encouraging open discussions, and fostering collaborative research endeavors. Through their mentorship, students will have the opportunity to engage in cutting-edge research projects, pushing the boundaries of scientific knowledge and contributing to the advancement of the chemical sciences.

We envision our M.Sc. (Organic Chemistry) postgraduates act as catalysts for positive change, equipped to drive innovation, shape industries, and address societal challenges through their expertise in chemistry. Whether your passion lies in research, industry, education, or beyond, our program aims to provide the knowledge and skills necessary to excel in your chosen path.

### 2) Aims and Objectives

The aims and objectives of M.Sc. (Organic Chemistry) course are designed to provide students with a well-rounded and advanced education in the field of Organic chemistry. These goals focus on equipping students with a deep understanding of chemical principles, fostering research and analytical skills, and preparing them for successful careers in various sectors of the chemical sciences.

The M.Sc. (Organic Chemistry) course aims to produce skilled and knowledgeable professionals who can contribute to scientific research, industrial innovation, and the betterment of society through their expertise in Organic chemistry.

### 3) Learning Outcomes

The learning outcomes of an M.Sc. (Organic Chemistry) course are designed to equip students with a comprehensive and advanced understanding of the field of chemistry. These learning outcomes reflect the knowledge, skills, and competencies that students are expected to gain upon successful completion of the program.

### 4) Any other point (if any) : The skills and knowledge acquired during this master's program will make the students well-equipped for diverse roles.

### 5) Credit Structure of the M.Sc. (Organic Chemistry) (Sem I, II, III & IV) (Table as per परिशिष्ट-1 with sign of HOD and Dean)



5. Credit Structure of the program (Sem-I, II, III & IV) (Table as per Parishisht 1 with Sign of HOD and Dean)

R: \_\_\_\_\_

Post Graduate Programs in University

Parishishta1

Year (2 Year PG)	Level	Sem (2 Year)	Major		RM	OJ T /FP	RP	Cum. Cr.	Degree
			Mandatory*	Electives Any One					
I	6.0*	Sem I	Advanced Cost and Management Accounting ICredits 4  Direct and Indirect Taxation (Income Tax) Credits 4  Advanced Financial Accounting Credits 4  Advanced Trends in Accounting - ICredits 2	Credits 4  Mutual Fund Management and Wealth Management OR  Introduction to IND AS OR  Fundamental Analysis for Corporate  RM	4			22	I
		Sem II	Advanced Cost Accounting 4 Credits  Corporate Finance 4 Credits  Direct and Indirect Taxation (Goods and Services Tax) - 4 Credits  Advanced Trends in Accounting - II 2 Credits	Credits 4  Risk Management OR  Liquidation Accounting OR  Accounting of Housing Society & Charitable Trust		4		22	
Cum. Cr. For PG Diploma			28	8	4	4	-	44	





Exit option: PG Diploma (44 Credits after Three Year UG Degree)								
II	6.5	Sem III	Corporate Financial Accounting 4 Credits	Credits 4			4	22
			Advanced Auditing 4 Credits	Accounting and Taxation of Ecommerce Industries OR				
			Financial Services 4 Credits	Accounting and Taxation of Securities and Commodities OR				
			Advanced Trends in Accounting – III 2 Credits	Operations Research				
		Sem IV	Advanced Financial Management 4 Credits	Credits 4			6	22
			2. International Financial Reporting Standards 4 Credits	Financial Journalism OR				
			3. Personal Financial Planning 4 Credits	Auditing and Assurance (Accounting Ethics and Corporate Governance) OR				
				Forex (Foreign Exchange Rate Management and Derivatives)				
Cum. Cr. For 1 Yr PG Degree			26	8			10	44
Cum. Cr. For 2 Yr PG Degree			54	16	4	4	10	88

Note:- \*The number of courses can vary for totaling 14 Credits for Major Mandatory Courses in a semester as illustrated

Prof (Dr) Sangeeta N Pawar  
Professor and Head  
Department of Commerce  
University of Mumbai

Dr. Kavita Laghate,  
Dean,  
Commerce and Management  
University of Mumbai

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Anandibai Raorane Arts, Commerce  
& Science College, Vaibhavwadi



AC – 07/07/2023

Item No. – 6.13 (N)

## As Per NEP 2020

### University of Mumbai



#### Title of the program

A- P.G. Diploma in Analytical Chemistry	}	2023-24
B- M.Sc. (Analytical Chemistry) (Two Year)		
C- M.Sc. (Analytical Chemistry) (One Year) -		2027-28

#### Syllabus for the Semester – Sem I & II

Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG

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Anandilal Raorane Arts, Commerce  
& Science College, Valbhavwadi





## Preamble

### 1) Introduction

This program is designed to provide a comprehensive and in-depth understanding of the fascinating world of Analytical Chemistry. Through a rigorous academic curriculum and hands-on research experience, we aim to nurture the intellectual curiosity and scientific acumen of our students, preparing them for successful careers in various sectors of the chemical sciences. The M.Sc. (Analytical Chemistry) course is structured to equip students with a strong theoretical foundation, practical skills, and critical thinking abilities necessary to address the challenges and opportunities in the diverse fields of chemistry. Our esteemed faculty members are experts in their respective fields, with a passion for both teaching and research. They are committed to providing a nurturing learning environment, encouraging open discussions, and fostering collaborative research endeavors. Through their mentorship, students will have the opportunity to engage in cutting-edge research projects, pushing the boundaries of scientific knowledge and contributing to the advancement of the chemical sciences.

We envision our M.Sc. (Analytical Chemistry) postgraduates act as catalysts for positive change, equipped to drive innovation, shape industries, and address societal challenges through their expertise in chemistry. Whether your passion lies in research, industry, education, or beyond, our program aims to provide the knowledge and skills necessary to excel in your chosen path.

### 2) Aims and Objectives

The aims and objectives of M.Sc. (Analytical Chemistry) course are designed to provide students with a well-rounded and advanced education in the field of Analytical chemistry. These goals focus on equipping students with a deep understanding of chemical principles, fostering research and analytical skills, and preparing them for successful careers in various sectors of the chemical sciences. The M.Sc. (Analytical Chemistry) course aims to produce skilled and knowledgeable professionals who can contribute to scientific research, industrial innovation, and the betterment of society through their expertise in Analytical chemistry.

### 3) Learning Outcomes

The learning outcomes of M.Sc. (Analytical Chemistry) course are designed to equip students with a comprehensive and advanced understanding of the field of chemistry. These learning outcomes reflect the knowledge, skills, and competencies that students are expected to gain upon successful completion of the program.

- 4) **Any other point (if any):** The skills and knowledge acquired during this master's program will make the students well-equipped for diverse roles.
- 5) **Credit Structure of the M.Sc. (Analytical Chemistry) (Sem I, II, III & IV)** (Table as per परिशिष्ट-1 with sign of HOD and Dean)





परिशिष्ट-1

Year	Level	Sem	Major				RM	OJT/ FP	RP	Cum. Cr.	Degree	
			Mandatory		Electives							
1	6.0	Sem I	3×4+ 2=14			4	4	Research Methodology (CHEM 506)	--	--	22	PG Diploma (after 3 Years Degree)
			Inorganic Chemistry-I (CHEM 502)	T H	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Physical Chemistry-I + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50111) <b>(OR)</b> <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Physical Chemistry-II + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50112)						
			Organic Chemistry-I (CHEM 503)	TH	4							
			Analytical Chemistry-I (CHEM 505)	TH	4							
			Chemistry Practical-I (Organic Chemistry and Analytical Chemistry) (PRCHEMOA 504)	PR	2							
		Sem II	3*4+ 2=14			4	--	4 CHEM 512	--	22		
			Inorganic Chemistry-II (CHEM 508)	T H	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Physical Chemistry-III + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50711) <b>(OR)</b> <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Physical Chemistry-IV + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50712)						
			Organic Chemistry -II (CHEM 509)	T H	4							
			Analytical Chemistry -II (CHEM 510)	T H	4							
			Chemistry Practical-II (Organic Chemistry and Analytical Chemistry) (PRCHEMOA 511)	PR	2							
Cum. Cr. For PG Diploma			28	8	4	4	44					
Exit Option: PG Diploma (44 credits) after Three Year UG Degree												



Year	Level	Sem (2yr)	Major				RM	OJT/FP	RP	Cum. Cr.	Degree	
2	6.5	Sem III	3*4+ 2=14			4		-	-	4 (CHEM 646)	22	PG Degree after 3-yr UG or PG Degree after 4-yr UG
			Paper -I (Theoretical organic chemistry-I) (CHEM 641)	TH		Paper IV (Medicinal Chemistry) + Practical (CHEM 64511) <b>OR</b> Paper IV (Biogenesis and green chemistry) + Practical (CHEM 64511) <b>OR</b> Advanced Topics in Organic Chemistry-I (CHEM 64513)						
			Paper II (Synthetic Organic Chemistry-I) (CHEM 642)	TH								
			Paper III (Natural products and Spectroscopy-I) (CHEM 643)	TH								
			Organic Chemistry Practical (CHEM 644)	PR								
		Sem IV	3*4=12			4		-	-	6 (CHEM 651)	22	
			Paper I (Theoretical organic chemistry-II) (CHEM 647)	TH	4	Paper IV (Natural products and heterocyclic chemistry-II) (CHEM 65011) <b>(OR)</b> Advanced Topics in Organic Chemistry-II (CHEM 65012)						
			Paper II (Synthetic organic chemistry-II) (CHEM 648)	TH	4							
			Paper III (Bio Organic Chemistry) (CHEM 649)	PR	4							
		Cum. Cr. For 1 Yr PG Degree			26			8		10	44	
Cum. Cr. For 2 Yr PG Degree			54			16	4	4	10	88		

Sign of HOD

*Garje*

Prof. Shivram S. Garje  
Head of Department,  
Department of Chemistry,  
University of Mumbai

**HEAD**  
**DEPARTMENT OF CHEMISTRY**  
**UNIVERSITY OF MUMBAI**

Sign of Dean,

*Garje*

Prof. Shivram S. Garje  
Dean, Science and Technology  
University of Mumbai

*Colkade*  
**PRINCIPAL**  
Anandilal Raorane Arts, Commerce  
& Science College, Vaibhavwadi



AC – 07/07/2023  
Item No. – 7.3 (N)

**As Per NEP 2020**

## **University of Mumbai**



**Title of the program**

- |   |   |                |
|---|---|----------------|
| <b>A- P.G. Diploma in Advance Accountancy</b>               | } | <b>2023-24</b> |
| <b>B- M.Com. (Advance Accountancy) (Two Year)</b>           |   |                |
| <b>C- M.Com. (Advance Accountancy) (One Year) – 2027-28</b> |   |                |

**Syllabus for**

**Semester – Sem I**

**Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG**

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## Preamble

### 1) Introduction

Advanced Cost and Management Accounting is a dynamic subject in the field of accounting. This subject helps to identify the cost concepts and its impact on the profitability of the business thereby making the process of managerial decision making easy and quick.

### 2) Aims and Objectives

1. To enhance the abilities of learners to develop the concept of Cost and management accounting and its significance in the business
2. To enable the learners to understand, develop and apply the techniques of costing in the decision making in the business corporate
3. To enable the learners in understanding, developing, preparing and presenting the financial report in the business corporate

### 3) Learning Outcomes

1. The students will be able to identify and analyse Cost concepts and understand managerial decision making
2. The students will be able to understand standard practices associated with Standard Costing and Variance analysis
3. The students will be able to prepare and present functional budgets at organizational level
4. The students will be able to identify and analyse practices associated with Operating costing

### 4) Any other point (if any)

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## Post Graduate Program: M.Sc. (Analytical Chemistry)

परिशिष्ट-1

Year	Level	Sem	Major				RM	OJT/FP	RP	Cum. Cr.	Degree
			Mandatory*		Electives any one						
I	6.0	Sem I	3*4+ 2=14		4		4	Research Methodology (CHEM 506)	-	22	PG Diploma (after 3 Years Degree)
			Physical Chemistry-I (CHEM 501)	TH	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Inorganic Chemistry-I + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50211)  (OR) <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Inorganic Chemistry-II + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50212)					
			Organic Chemistry-I (CHEM 503)	TH	4						
			Analytical Chemistry-I (CHEM 505)	TH	4						
			Chemistry Practical-I (Analytical Chemistry and Physical Chemistry) (PRCHEMAP 504)	PR	2						
		Sem II	3*4+ 2=14		4		-	4 CHEM 512	-	22	
			Physical Chemistry-II (CHEM 507)	TH	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Inorganic Chemistry-III + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50811)  (OR) <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Inorganic Chemistry-IV + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50812)					
			Organic Chemistry -II (CHEM 509)	TH	4						
			Analytical Chemistry -II (CHEM 510)	TH	4						
			Chemistry Practical-II (Analytical Chemistry and Physical Chemistry) (PRCHEMAP 511)	PR	2						
Cum. Cr. For PG Diploma			28		8		4	4		44	
Exit Option: PG Diploma (44 credits) after Three Year UG Degree											



Year	Level	Sem (2yr)	Major				RM	OJT/FP	RP	Cum. Cr.	Degree			
II	6.5	Sem III	3*4+ 2=14			4		-	-	4 (CHEM 666)	22	PG Degree after 3-yr UG		
			Quality in Analytical Chemistry -I	TH	4	Environmental Chemistry	+ Practical  (CHEM 66511)  OR Industrially Important Materials  + Practical  (CHEM 66512)							
			(CHEM 661)											
			Advanced Instrumental Techniques -I	TH	4									
			(CHEM 662)											
			Bioanalytical Chemistry and Food Analysis (CHEM 663)	TH	4									
			Analytical Chemistry Practical (CHEM 664)	PR	2									
			Sem IV	3*4=12			4		-	-	6 (CHEM 671)		22	
				Quality in Analytical Chemistry -II (CHEM 667)	TH	4	Intellectual Property Rights & Cheminformatics	(CHEM 67011) (OR) Pharmaceutical and Organic Analysis (CHEM 67012)						
				Advanced Instrumental Techniques -II (CHEM 668)	TH	4								
		Selected Topics in Analytical Chemistry (CHEM 669)		TH	4									
		Cum. Cr. For 1 Yr PG Degree			26			8					10	44
		Cum. Cr. For 2 Yr PG Degree			54			16		4	4		10	88

Note \*The number of courses can vary for totaling 14 credits for Major Mandatory courses in a semester as illustrated.

Sign of HOD

*Garje*

Prof. Shivram S. Garje  
Head of Department,  
Department of Chemistry,  
University of Mumbai

**HEAD**  
**DEPARTMENT OF CHEMISTRY**  
**UNIVERSITY OF MUMBAI**

Sign of Dean,

*Garje*

Prof. Shivram S. Garje  
Dean, Science and Technology  
University of Mumbai

*Chakrade*

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& Science College, Vaidhyanagar



**University of Mumbai**



**Revised Syllabus of Courses  
of  
Master of Commerce (M.Com)  
Programme  
at  
Second Year  
Semester III and IV**

**Under Choice Based Credit, Grading and  
Semester System**

*(To be implemented from Academic Year 2017-2018)*

***Faculty of Commerce***



# Master of Commerce (M.Com) Programme

## Under Choice Based Credit, Grading and Semester System

### Course Structure

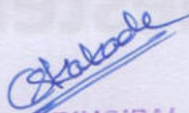


#### M.Com II

(To be implemented from Academic Year- 2017-2018)

No. of Courses	Semester III	Credits	No. of Courses	Semester IV	Credits
1	<b>Elective Courses (EC)</b>		1	<b>Elective Courses (EC)</b>	
1,2 and 3	*Any one group of courses from the following list of the courses (Group – A/B/C/D/E)	18	1,2 and 3	**Any one group of courses from the following list of the courses (Group – A/B/C/D/E)	18
2	✓ <b>Project Work</b>		2	✓ <b>Project Work</b>	
4	Project Work - I	06	4	Project Work - II	06
<b>Total Credits</b>		<b>24</b>	<b>Total Credits</b>		<b>24</b>

✓ **Note:** Project work is considered as a special course involving application of knowledge in solving/ analyzing/ exploring a real life situation/ difficult problem. Project work would be of 06 credits. A project work may be undertaken in any area of Elective Courses

  
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# **University of Mumbai**

## **Syllabus for M. A. English Program: Part II**

### **Semester III & IV**

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





**Syllabus for M.A. Semester III and IV as per Choice Based Credit System with effect from the Academic Year 2017-18:**

**Course Structure:**

**1.1 Credits:** A course that is taught for 4 hours a week for a period of 15 weeks will carry six credits.

**1.2. Course credits:** To qualify in a given course, a student will have to acquire six credits in the course. Out of these, four credits are central teaching component and two credits are for the self-study component. The self study component will consist of academic tasks outside the classroom that will be assigned by the teacher from time to time. The self study component assigned in this manner will be related to or an extension of but not in lieu of the prescribed syllabus. The self-study component will be given a weightage of 33% in the evaluation of the student. In case of courses with practical component/ field-work components, four credits are for theory course and two credits shall be practical component/field-work component (regulation 5.1 to 5.9).

**1. 3. M. A. Programme:** A student who acquires a minimum of 100 credits over four semesters will be declared eligible for the award of the M.A. degree.

**1.4. Courses:** There shall be five types of courses: (i) Core Course; (ii) Elective Course; (iii) Interdisciplinary/Cross-disciplinary Courses; (iv) Audit Courses; (v) Project-based Courses; (vi) Ability Enhancement Courses

**(i) Core Course:** Core courses are courses that impart instruction in the basic non-specialized aspects of a discipline that constitute the minimum basic competency in that discipline, regardless of any specialization that the learner might choose in the future. Core-Courses shall be offered by the parent department. Core courses shall be for six credits. Minimum 50% courses of the MA programme over four semesters must be core courses.

**(ii) Elective Courses:** Elective courses shall be courses offered by the parent department that impart instructions in specialized/advanced/supportive aspects of the relevant discipline. Each department shall offer a pool of such courses from which a student can choose. Elective Courses shall be for six credits. The syllabus for each elective course will have a preamble clearly stating the course and the learner objectives for the elective, along with the pre-requisites if any and a detailed list of references.

**(iii) Interdisciplinary/Cross Disciplinary Courses (I/C courses):** I/C courses shall be offered by parent department and departments other than parent department. One 'course basket' shall be created for the same. Each MA program has to offer a minimum of two courses and maximum of four courses in the basket. Every I/C course shall be for six credits. A student may opt for an I/C course offered by his/her parent department.

**(iv) Audit Courses:** Students can audit a course from the parent department as well as from other departments in addition to the core, elective and I/C courses that are mandatory, with the prior permission of the head/s of the relevant department/s. Such a student will have to apply in writing at most a week after the relevant course has commenced. For the audit course, a student shall attend lectures of the audited course. The student cannot appear for the semester-end examination for the audited course. However, the student shall appear for the





internal examination/assessment. The audit course appears on the mark-sheet only when the student passes the internal assessment with minimum 50% marks, failing to which, the student cannot claim the audit for that course. The internal marks shall not be displayed on final mark-sheet. The internal marks shall not be used for the credit computation. A student is permitted to audit maximum four courses in the MA program.

**(v) Ability Enhancement Course:** The ability enhancement courses are skills based course. The ability enhancement courses are to be offered at fourth semester.

**(vi) Project based courses:** Project based courses shall consist of a dissertation. Each dissertation course will carry 10 credits. Every learner shall choose one project based course.

## **2: Rules for programmes not having a practical component**

**2.1:** Four core courses shall be offered in semesters 1 and 2 each.

**2.2.** Five elective courses shall be offered in the third semester. No other courses will be offered in the third semester.

**2.3.** The fourth semester shall consist of one ability enhancement course, one interdisciplinary/cross disciplinary courses (I/C courses) and one project based course.

**2.4.** Each department will offer at least one I/C course during semester 4. The learner can choose any one course from this basket, including the course offered by his/her parent department. The preamble to this course will clearly specify the prerequisites for this course.

**2.5.** A learner will have to apply to the relevant department in writing no later than two weeks after the commencement of the fourth semester for taking the I/C course offered by that department.

**2.6.** A learner can relinquish an I/C course chosen by him/her no later than two weeks after the commencement of the fourth semester by applying to the Head of the Department whose I/C course the student wishes to opt for. The application will have to be endorsed by the head of the Department whose I/C course the student has relinquished and the Head of the parent department.

**2.7.** The Head of the Department offering a specific I/C course will convey the marks of the internal examination obtained by students taking the course to the Head of the parent department before the commencement of the end semester examination of the parent department.





**The Outline:** Each course in the category of Elective Course/Ability Enhancement Course/Interdisciplinary/Cross-disciplinary Course shall be of 100 marks and out of that 40 marks shall be allocated for internal assessment and the remaining 60 marks shall be allocated for semester end examination. Each will have 6 Credits.

The Project based courses shall be of 100 marks consisting of a dissertation. Each dissertation course will carry 10 Credits. The criteria for evaluation will be as per the university guidelines.

[For further details see the Choice Based Credit System—Regulations of the University of Mumbai]

<b>Elective Courses: Semester III</b>			
Sr. No			
<b>I</b>	<b>Elective I</b>	<b>Course Code</b>	<b>Paper No.</b>
1	Poetry from Chaucer to the Present	PAENG301	Paper I- A
2	English Language Teaching	PAENG301	Paper I- B
<b>II</b>	<b>Elective II</b>		
1	Gendered Perspectives on Literature	PAENG302	Paper II- A
2	Nineteenth Century American Literature	PAENG302	Paper II- B
<b>III</b>	<b>Elective III</b>		
1	New Literatures in English	PAENG303	Paper III -A
2	Twentieth Century American Literature	PAENG303	Paper III -B
<b>IV</b>	<b>Elective IV</b>		
1	Shakespeare	PAENG304	Paper IV-A
2	Modern Indian Fiction in English	PAENG304	Paper IV- B
<b>V</b>	<b>Elective V</b>		
1	Postcolonial Literature	PAENG305	Paper V- A
2	Indian Writing in Translation	PAENG305	Paper V-B
<b>Ability Enhancement Courses: Semester IV</b>			
1	Creative Writing	PAENG306	Paper I-A
2	Translation: Theory and Practice	PAENG306	Paper I-B





3	Research Methodology	PAENG306	Paper I- C
4	English for Academic and Commercial Purpose	PAENG306	Paper I-D
<b>Interdisciplinary/Cross-disciplinary Courses: Semester IV</b>			
1	Film and Literature	PAENG307	Paper II-A
2	Cultural Studies	PAENG307	Paper II-B
3	Media Studies	PAENG307	Paper II-C
4	Political Reading of Literature	PAENG307	Paper II-D
<b>Project Based Courses [Topics/Areas]</b>			
1	Comparative Literature	PAENG308	Paper III-A
2	Re-reading Canonical Texts	PAENG308	Paper III-B
3	Language and Literature	PAENG308	Paper III-C
4	Film Appreciation	PAENG308	Paper III- D
5	Art and Literature	PAENG308	Paper III- E
6	Study of Popular Culture	PAENG308	Paper III- F
7	Subaltern in Literature	PAENG308	Paper III-G
8	Literature and Environment	PAENG308	Paper III-H
9	Gendered Reading of Literature	PAENG308	Paper III-I
10	Literature of Diaspora	PAENG308	Paper III-J
11	Queer and LGBT Studies	PAENG308	Paper III-K
12	Folk Literature	PAENG308	Paper III-L
13	Mythology	PAENG308	Paper III-M
14	Spirituality and Literature	PAENG308	Paper III-N
15	Journalism and Literature	PAENG308	Paper III-O
16	Marginality and Protest in Literature	PAENG308	Paper III-P





### Details of Course and Credit Structure:

Semester	Nature of Course	No of Courses	Total Credit
I	Core Course	04	4X6=24
II	Core Course	04	4X6=24
III	Elective Course	05	5X6=30
IV	Ability Enhancement Course	01	06
	Interdisciplinary/Cross Disciplinary Course	01	06
	Project Based Course	01	10
Total No. of Credit: 100			

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**AC - 14/06/2018**

**Item No. 4.71**

# **UNIVERSITY OF MUMBAI**



**Program : M.Sc.**

**( Choice Based Credit System )**

**Course : M.Sc. Organic Chemistry**

**Part - I**

**Syllabus for Semester III & IV**

**(To be implemented from the Academic year 2018-2019 )**





**Course Code: PSCHOOC-II 404**

**PAPER – IV: RESEARCH METHODOLOGY**

**Unit 1:**

[15L]

**Print:**

[5L]

Primary, Secondary and Tertiary sources.

**Journals:**

Journal abbreviations, abstracts, current titles, reviews, monographs, dictionaries, text-books, current contents, Introduction to Chemical Abstracts and Beilstein, Subject Index, Substance Index, Author Index, Formula Index, and other Indices with examples.

**Digital:**

[5L]

Web sources, E-journals, Journal access, TOC alerts, Hot articles, Citation Index, Impact factor, H-index, E-consortium, UGC infonet, E-books, Internet discussion groups and communities, Blogs, preprint servers, Search engines, Scirus, Google Scholar, ChemIndustry, Wiki-databases, ChemSpider, Science Direct, SciFinder, Scopus.

**Information Technology and Library Resources:**

[5L]

The Internet and World wide web, Internet resources for Chemistry, finding and citing published information.

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**Unit II: DATA ANALYSIS**

[15L]

**The Investigative Approach:**

Making and recording Measurements, SI units and their use, Scientific methods and design of experiments.

**Analysis and Presentation of Data:**

Descriptive statistics, choosing and using statistical tests, Chemometrics, Analysis of Variance (ANOVA), Correlation and regression, curve fitting, fitting of linear equations, simple linear cases, weighted linear case, analysis of residuals, general polynomial fitting, linearizing transformations, exponential function fit, r and its abuse, basic aspects of multiple linear regression analysis.

**Unit III: METHODS OF SCIENTIFIC RESEARCH AND WRITING**

[15L]





## SCIENTIFIC PAPERS

Reporting practical and project work, Writing literature surveys and reviews, organizing a poster display, giving an oral presentation.

### **Writing Scientific Papers:**

Justification for scientific contributions, bibliography, description of methods, conclusions, the need for illustration, style, publications of scientific work, writing ethics, avoiding plagiarism.

## Unit IV: CHEMICAL SAFETY & ETHICAL HANDLING OF CHEMICALS

[15L]

Safe working procedure and protective environment, protective apparel, emergency procedure, first aid, laboratory ventilation, safe storage and use of hazardous chemicals, procedure for working with substances that pose hazards, flammable or explosive hazards, procedures for working with gases at pressures above or below atmospheric pressure, safe storage and disposal of waste chemicals, recovery, recycling and reuse of laboratory chemicals, procedure for laboratory disposal of explosives, identification, verification and segregation of laboratory waste, disposal of chemicals in the sanitary sewer system, incineration and transportation of hazardous chemicals.

### REFERENCES:

1. Dean, J. R., Jones, A. M., Holmes, D., Reed, R., Weyers, J., & Jones, A., (2011), *Practical skills in Chemistry*, 2<sup>nd</sup> Ed., Prentice Hall, Harlow.
2. Hibbert, D. B. & Gooding, J. J. (2006) *Data Analysis for Chemistry* Oxford University Press.
3. Topping, J., (1984) *Errors of Observation and their Treatment* 4<sup>th</sup> Ed., Chapman Hill, London.
4. Harris, D. C. (2007) *Quantative Chemical Analysis* 6<sup>th</sup> Ed., Freeman Chapters 3-5
5. Levie, R. De. (2001) *How to use Excel in Analytical Chemistry and in general scientific data analysis* Cambridge University Press.
6. Chemical Safety matters – IUPAC-IPCS, (1992) Cambridge University Press.
7. OSU Safety manual 1.01

## **Semester IV: Practicals** **Course code: PSCHO4P1**

### **Two steps preparations**

1. Acetophenone → Acetophenone phenyl hydrazine → 2-phenyl





- indole.
- 2-naphthol  $\rightarrow$  1-phenyl azo-2-naphthol  $\rightarrow$  1-amino-2-naphthol.
  - Cyclohexanone  $\rightarrow$  cyclohexanone oxime  $\rightarrow$  Caprolactum.
  - Hydroquinone  $\rightarrow$  hydroquinone diacetate  $\rightarrow$  2,5-dihydroxyacetophenone.
  - 4-nitrotoluene  $\rightarrow$  4-nitrobenzoic acid  $\rightarrow$  4-aminobenzoic acid.
  - o*-nitroaniline  $\rightarrow$  *o*-phenylene diamine  $\rightarrow$  Benzimidazole.
  - Benzophenone  $\rightarrow$  benzophenone oxime  $\rightarrow$  benzanilide.
  - o*-chlorobenzoic acid  $\rightarrow$  N-phenyl anthranilic acid  $\rightarrow$  acridone.
  - Benzoin  $\rightarrow$  benzil  $\rightarrow$  benzilic acid.
  - Phthalic acid  $\rightarrow$  phthalimide  $\rightarrow$  anthranilic acid.
  - Resorcinol  $\rightarrow$  4-methyl-7-hydroxy coumarin  $\rightarrow$  4-methyl-7-acetoxy coumarin.
  - Anthracene  $\rightarrow$  anthraquinone  $\rightarrow$  anthrone.

**(Minimum 8 experiments)**

**Note:**

- Students are expected to know (i) the planning of synthesis, effect of reaction parameters including stoichiometry, and **safety aspects including MSDS** (ii) the possible mechanism, expected spectral data (IR and NMR) of the starting material and final product.
- Students are expected to purify the product by recrystallization, measure its mass or volume, check the purity by TLC, determine physical constant and calculate percentage yield.

**Course code: PSCHO4P2**

**Session-I: Combined spectral identification: Interpretation of spectral data of organic compounds (UV, IR, PMR, CMR and Mass spectra).**

A student will be given UV, IR, PMR, CMR, and Mass spectra of a compound from which preliminary information should be reported within first half an hour of the examination without referring to any book/reference material. The complete structure of the compound may then be elucidated by referring to any standard text-book/reference material etc **(Minimum 8 spectral analysis).**

**Session-II: Project evaluation**

**References for Practicals**

- Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis- V. K. Ahluwalia and Renu Aggarwal, Universities Press India Ltd., 2000
- Advanced Practical Organic Chemistry- N. K. Vishnoi, Third Addition, Vikas Publishing House PVT Ltd
- Systematic Laboratory Experiments in Organic Synthesis- A. Sethi, New Age International Publications
- Systematic Identification of Organic compounds, 6th edition, R. L. Shriner, R. C. Fuson and D.Y. Curtin Wiley, New York.
- Vogel's Textbook of Quantitative Analysis, revised, J. Bassett, R. C. Denney, G. H. Jeffery and J. Mendham, ELBS
- Experiments and Techniques in Organic Chemistry, D. Pasto, C. Johnson and M. Miller, Prentice Hall





7. Macro-scale and Micro-scale Organic Experiments, K. L. Williamson, D. C. Heath.
8. Systematic Qualitative Organic Analysis, H. Middleton, Adward Arnold.
9. Handbook of Organic Analysis- Qualitative and Quantitative, H. Clark, Adward Arnold.
10. Vogel's Textbook of Practical Organic Chemistry, Fifth edition, 2008, B.S. Furniss, A. J. Hannaford, P. W. G. Smith, A. R. Tatchell, Pearson Education.
11. Laboratory Manual of Organic Chemistry, Fifth edition, R K Bansal, New Age Publishers.
12. Organic structures from spectra, L. D. Field, S. Sternhell, John R. Kalman, Wiley, 4<sup>th</sup> ed., 2011.

1. The candidate is expected to submit a journal and project certified by the Head of the Department /institution at the time of the practical examination.
2. A candidate will not be allowed to appear for the practical examination unless he/she produces a certified journal or a certificate from the Head of the institution/department stating that the journal is lost and the candidate has performed the required number of experiments satisfactorily. The list of the experiments performed by the candidate should be attached with such certificate.
3. Use of non-programmable calculator is allowed both at the theory and the practical examination.

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AC – 07/07/2023  
Item No. – 6.12 (N)

## As Per NEP 2020

### University of Mumbai



#### Title of the program

- |   |   |                |
|---|---|----------------|
| A- P.G. Diploma in Organic Chemistry      | } | <b>2023-24</b> |
| B- M.Sc. (Organic Chemistry) (Two Year)   |   |                |
| C- M.Sc. (Organic Chemistry) (One Year) - |   |                |

#### Syllabus for the Semester – Sem I & II

Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG

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& Science College, Valbhavwadi

## Preamble





**5. Credit Structure of the program (Sem-I, II, III & IV) (Table as per Parishisht 1 with Sign of HOD and Dean)**

R: \_\_\_\_\_

**Post Graduate Programs in University**

**Parishishta1**

Year (2 Year PG)	Level	Sem (2 Year)	Major		RM	OJ T /FP	RP	Cum. Cr.	Degree
			Mandatory*	Electives Any One					
I	6.0*	Sem I	Advanced Cost and Management Accounting ICredits 4  Direct and Indirect Taxation (Income Tax) Credits 4  Advanced Financial Accounting Credits 4  Advanced Trends in Accounting - ICredits 2	Credits 4  Mutual Fund Management and Wealth Management OR  Introduction to IND AS OR  Fundamental Analysis for Corporate  RM	4			22	I
		Sem II	Advanced Cost Accounting 4 Credits  Corporate Finance 4 Credits  Direct and Indirect Taxation (Goods and Services Tax) - 4 Credits  Advanced Trends in Accounting - II 2 Credits	Credits 4  Risk Management OR  Liquidation Accounting OR  Accounting of Housing Society & Charitable Trust		4		22	
Cum. Cr. For PG Diploma			28	8	4	4	-	44	



**Exit option: PG Diploma (44 Credits after Three Year UG Degree)**

II	6.5	Sem III	Corporate Financial Accounting 4 Credits	Credits 4			4	22	PG Degree After 3-Yr. UG
			Advanced Auditing 4 Credits	Accounting and Taxation of Ecommerce Industries OR					
			Financial Services 4 Credits	Accounting and Taxation of Securities and Commodities OR					
			Advanced Trends in Accounting – III 2 Credits	Operations Research					
		Sem IV	Advanced Financial Management 4 Credits	Credits 4			6	22	
			2. International Financial Reporting Standards 4 Credits	Financial Journalism OR					
			3. Personal Financial Planning 4 Credits	Auditing and Assurance (Accounting Ethics and Corporate Governance) OR					
				Forex (Foreign Exchange Rate Management and Derivatives)					
Cum. Cr. For 1 Yr PG Degree			26	8			10	44	
Cum. Cr. For 2 Yr PG Degree			54	16	4	4	10	88	

Note:- \*The number of courses can vary for totaling 14 Credits for Major Mandatory Courses in a semester as illustrated

**Prof (Dr) Sangeeta N Pawar**  
Professor and Head  
Department of Commerce  
University of Mumbai

**Dr. Kavita Laghate,**  
Dean,  
Commerce and Management  
University of Mumbai

**PRINCIPAL**  
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AC – 07/07/2023

Item No. – 6.13 (N)

## As Per NEP 2020

### University of Mumbai



#### Title of the program

A- P.G. Diploma in Analytical Chemistry	}	2023-24
B- M.Sc. (Analytical Chemistry) (Two Year)		
C- M.Sc. (Analytical Chemistry) (One Year) -		2027-28

#### Syllabus for the Semester – Sem I & II

Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG

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## Preamble

### 1) Introduction

This program is designed to provide a comprehensive and in-depth understanding of the fascinating world of Analytical Chemistry. Through a rigorous academic curriculum and hands-on research experience, we aim to nurture the intellectual curiosity and scientific acumen of our students, preparing them for successful careers in various sectors of the chemical sciences. The M.Sc. (Analytical Chemistry) course is structured to equip students with a strong theoretical foundation, practical skills, and critical thinking abilities necessary to address the challenges and opportunities in the diverse fields of chemistry. Our esteemed faculty members are experts in their respective fields, with a passion for both teaching and research. They are committed to providing a nurturing learning environment, encouraging open discussions, and fostering collaborative research endeavors. Through their mentorship, students will have the opportunity to engage in cutting-edge research projects, pushing the boundaries of scientific knowledge and contributing to the advancement of the chemical sciences.

We envision our M.Sc. (Analytical Chemistry) postgraduates act as catalysts for positive change, equipped to drive innovation, shape industries, and address societal challenges through their expertise in chemistry. Whether your passion lies in research, industry, education, or beyond, our program aims to provide the knowledge and skills necessary to excel in your chosen path.

### 2) Aims and Objectives

The aims and objectives of M.Sc. (Analytical Chemistry) course are designed to provide students with a well-rounded and advanced education in the field of Analytical chemistry. These goals focus on equipping students with a deep understanding of chemical principles, fostering research and analytical skills, and preparing them for successful careers in various sectors of the chemical sciences. The M.Sc. (Analytical Chemistry) course aims to produce skilled and knowledgeable professionals who can contribute to scientific research, industrial innovation, and the betterment of society through their expertise in Analytical chemistry.

### 3) Learning Outcomes

The learning outcomes of M.Sc. (Analytical Chemistry) course are designed to equip students with a comprehensive and advanced understanding of the field of chemistry. These learning outcomes reflect the knowledge, skills, and competencies that students are expected to gain upon successful completion of the program.

- 4) **Any other point (if any):** The skills and knowledge acquired during this master's program will make the students well-equipped for diverse roles.
- 5) **Credit Structure of the M.Sc. (Analytical Chemistry) (Sem I, II, III & IV)** (Table as per परिशिष्ट-1 with sign of HOD and Dean)





परिशिष्ट-1

Year	Level	Sem	Major			RM	OJT/ FP	RP	Cum. Cr.	Degree	
			Mandatory		Electives						
1	6.0	Sem I	3×4+ 2=14			4	4	Research Methodology (CHEM 506)	--	--	22
			Inorganic Chemistry-I (CHEM 502)	T H	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Physical Chemistry-I + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50111) <b>(OR)</b> <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Physical Chemistry-II + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50112)					
			Organic Chemistry-I (CHEM 503)	TH	4						
			Analytical Chemistry-I (CHEM 505)	TH	4						
			Chemistry Practical-I (Organic Chemistry and Analytical Chemistry) (PRCHEMOA 504)	PR	2						
		Sem II	3*4+ 2=14			4	--	4 CHEM 512	--	22	
			Inorganic Chemistry-II (CHEM 508)	T H	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Physical Chemistry-III + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50711) <b>(OR)</b> <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Physical Chemistry-IV + Chemistry Practicals (Physical Chemistry and Inorganic Chemistry) (CHEM 50712)					
			Organic Chemistry -II (CHEM 509)	T H	4						
			Analytical Chemistry -II (CHEM 510)	T H	4						
			Chemistry Practical-II (Organic Chemistry and Analytical Chemistry) (PRCHEMOA 511)	PR	2						
Cum. Cr. For PG Diploma			28	8	4	4	44				

Exit Option: PG Diploma (44 credits) after Three Year UG Degree



Year	Level	Sem (2yr)	Major				RM	OJT/FP	RP	Cum. Cr.	Degree	
2	6.5	Sem III	3*4+ 2=14			4		-	-	4 (CHEM 646)	22	PG Degree after 3-yr UG or PG Degree after 4-yr UG
			Paper -I (Theoretical organic chemistry-I) (CHEM 641)	TH		Paper IV (Medicinal Chemistry) + Practical (CHEM 64511) <b>OR</b> Paper IV (Biogenesis and green chemistry) + Practical (CHEM 64511) <b>OR</b> Advanced Topics in Organic Chemistry-I (CHEM 64513)						
			Paper II (Synthetic Organic Chemistry-I) (CHEM 642)	TH								
			Paper III (Natural products and Spectroscopy-I) (CHEM 643)	TH								
			Organic Chemistry Practical (CHEM 644)	PR								
		Sem IV	3*4=12			4		-	-	6 (CHEM 651)	22	
			Paper I (Theoretical organic chemistry-II) (CHEM 647)	TH	4	Paper IV (Natural products and heterocyclic chemistry-II) (CHEM 65011) <b>(OR)</b> Advanced Topics in Organic Chemistry-II (CHEM 65012)						
			Paper II (Synthetic organic chemistry-II) (CHEM 648)	TH	4							
			Paper III (Bio Organic Chemistry) (CHEM 649)	PR	4							
		Cum. Cr. For 1 Yr PG Degree			26			8		10	44	
Cum. Cr. For 2 Yr PG Degree			54			16	4	4	10	88		

Sign of HOD

*Garje*

Prof. Shivram S. Garje  
Head of Department,  
Department of Chemistry,  
University of Mumbai

**HEAD**  
**DEPARTMENT OF CHEMISTRY**  
**UNIVERSITY OF MUMBAI**

Sign of Dean,

*Garje*

Prof. Shivram S. Garje  
Dean, Science and Technology  
University of Mumbai

*Colkalkade*  
**PRINCIPAL**  
Anandilal Raorane Arts, Commerce  
& Science College, Vaibhavwadi





AC – 07/07/2023  
Item No. – 7.3 (N)

**As Per NEP 2020**

## **University of Mumbai**



**Title of the program**

- |   |   |                |
|---|---|----------------|
| <b>A- P.G. Diploma in Advance Accountancy</b>               | } | <b>2023-24</b> |
| <b>B- M.Com. (Advance Accountancy) (Two Year)</b>           |   |                |
| <b>C- M.Com. (Advance Accountancy) (One Year) – 2027-28</b> |   |                |

**Syllabus for**

**Semester – Sem I**

**Ref: GR dated 16<sup>th</sup> May, 2023 for Credit Structure of PG**

*C. K. K. K.*

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## Preamble

### 1) Introduction

Advanced Cost and Management Accounting is a dynamic subject in the field of accounting. This subject helps to identify the cost concepts and its impact on the profitability of the business thereby making the process of managerial decision making easy and quick.

### 2) Aims and Objectives

1. To enhance the abilities of learners to develop the concept of Cost and management accounting and its significance in the business
2. To enable the learners to understand, develop and apply the techniques of costing in the decision making in the business corporate
3. To enable the learners in understanding, developing, preparing and presenting the financial report in the business corporate

### 3) Learning Outcomes

1. The students will be able to identify and analyse Cost concepts and understand managerial decision making
2. The students will be able to understand standard practices associated with Standard Costing and Variance analysis
3. The students will be able to prepare and present functional budgets at organizational level
4. The students will be able to identify and analyse practices associated with Operating costing

### 4) Any other point (if any)

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## Post Graduate Program: M.Sc. (Analytical Chemistry)

परिशिष्ट-1

Year	Level	Sem	Major				RM	OJT/FP	RP	Cum. Cr.	Degree
			Mandatory*		Electives any one						
I	6.0	Sem I	3*4+ 2=14		4		4	Research Methodology (CHEM 506)	-	22	PG Diploma (after 3 Years Degree)
			Physical Chemistry-I (CHEM 501)	TH	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Inorganic Chemistry-I + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50211)  (OR) <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Inorganic Chemistry-II + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50212)					
			Organic Chemistry-I (CHEM 503)	TH	4						
			Analytical Chemistry-I (CHEM 505)	TH	4						
			Chemistry Practical-I (Analytical Chemistry and Physical Chemistry) (PRCHEMAP 504)	PR	2						
		Sem II	3*4+ 2=14		4		-	4 CHEM 512	-	22	
			Physical Chemistry-II (CHEM 507)	TH	4	<b>Credits 4 (2+2)</b> <b>Course 1 :</b> Inorganic Chemistry-III + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50811)  (OR) <b>Credits 4 (2+2)</b> <b>Course 2 :</b> Inorganic Chemistry-IV + Chemistry Practicals (Inorganic Chemistry and Organic Chemistry) (CHEM 50812)					
			Organic Chemistry -II (CHEM 509)	TH	4						
			Analytical Chemistry -II (CHEM 510)	TH	4						
			Chemistry Practical-II (Analytical Chemistry and Physical Chemistry) (PRCHEMAP 511)	PR	2						
Cum. Cr. For PG Diploma			28		8		4	4		44	
Exit Option: PG Diploma (44 credits) after Three Year UG Degree											



Year	Level	Sem (2yr)	Major				RM	OJT/FP	RP	Cum. Cr.	Degree			
II	6.5	Sem III	3*4+ 2=14			4		-	-	4 (CHEM 666)	22	PG Degree after 3-yr UG		
			Quality in Analytical Chemistry -I	TH	4	Environmental Chemistry	+ Practical  (CHEM 66511)  OR Industrially Important Materials  + Practical  (CHEM 66512)							
			(CHEM 661)											
			Advanced Instrumental Techniques -I	TH	4									
			(CHEM 662)											
		Bioanalytical Chemistry and Food Analysis (CHEM 663)	TH	4										
		Analytical Chemistry Practical (CHEM 664)	PR	2										
		Sem IV	3*4=12			4		-	-	6 (CHEM 671)	22			
			Quality in Analytical Chemistry -II (CHEM 667)	TH	4	Intellectual Property Rights & Cheminformatics	(CHEM 67011) (OR) Pharmaceutical and Organic Analysis (CHEM 67012)							
			Advanced Instrumental Techniques -II (CHEM 668)	TH	4									
			Selected Topics in Analytical Chemistry (CHEM 669)	TH	4									
		Cum. Cr. For 1 Yr PG Degree			26			8					10	44
		Cum. Cr. For 2 Yr PG Degree			54			16		4	4		10	88

Note \*The number of courses can vary for totaling 14 credits for Major Mandatory courses in a semester as illustrated.

Sign of HOD

*Garje*

Prof. Shivram S. Garje  
Head of Department,  
Department of Chemistry,  
University of Mumbai

**HEAD**  
**DEPARTMENT OF CHEMISTRY**  
**UNIVERSITY OF MUMBAI**

Sign of Dean,

*Garje*

Prof. Shivram S. Garje  
Dean, Science and Technology  
University of Mumbai

*Chakrade*

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**University of Mumbai**



**Revised Syllabus of Courses  
of  
Master of Commerce (M.Com)  
Programme  
at  
Second Year  
Semester III and IV**

**Under Choice Based Credit, Grading and  
Semester System**

*(To be implemented from Academic Year 2017-2018)*

***Faculty of Commerce***



# Master of Commerce (M.Com) Programme

## Under Choice Based Credit, Grading and Semester System

### Course Structure

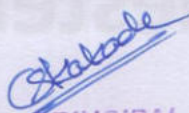


#### M.Com II

(To be implemented from Academic Year- 2017-2018)

No. of Courses	Semester III	Credits	No. of Courses	Semester IV	Credits
1	<b>Elective Courses (EC)</b>		1	<b>Elective Courses (EC)</b>	
1,2 and 3	*Any one group of courses from the following list of the courses (Group – A/B/C/D/E)	18	1,2 and 3	**Any one group of courses from the following list of the courses (Group – A/B/C/D/E)	18
2	✓ <b>Project Work</b>		2	✓ <b>Project Work</b>	
4	Project Work - I	06	4	Project Work - II	06
<b>Total Credits</b>		<b>24</b>	<b>Total Credits</b>		<b>24</b>

✓ **Note:** Project work is considered as a special course involving application of knowledge in solving/ analyzing/ exploring a real life situation/ difficult problem. Project work would be of 06 credits. A project work may be undertaken in any area of Elective Courses

  
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# **University of Mumbai**

## **Syllabus for M. A. English Program: Part II**

### **Semester III & IV**

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





**Syllabus for M.A. Semester III and IV as per Choice Based Credit System with effect from the Academic Year 2017-18:**

**Course Structure:**

**1.1 Credits:** A course that is taught for 4 hours a week for a period of 15 weeks will carry six credits.

**1.2. Course credits:** To qualify in a given course, a student will have to acquire six credits in the course. Out of these, four credits are central teaching component and two credits are for the self-study component. The self study component will consist of academic tasks outside the classroom that will be assigned by the teacher from time to time. The self study component assigned in this manner will be related to or an extension of but not in lieu of the prescribed syllabus. The self-study component will be given a weightage of 33% in the evaluation of the student. In case of courses with practical component/ field-work components, four credits are for theory course and two credits shall be practical component/field-work component (regulation 5.1 to 5.9).

**1. 3. M. A. Programme:** A student who acquires a minimum of 100 credits over four semesters will be declared eligible for the award of the M.A. degree.

**1.4. Courses:** There shall be five types of courses: (i) Core Course; (ii) Elective Course; (iii) Interdisciplinary/Cross-disciplinary Courses; (iv) Audit Courses; (v) Project-based Courses; (vi) Ability Enhancement Courses

**(i) Core Course:** Core courses are courses that impart instruction in the basic non-specialized aspects of a discipline that constitute the minimum basic competency in that discipline, regardless of any specialization that the learner might choose in the future. Core-Courses shall be offered by the parent department. Core courses shall be for six credits. Minimum 50% courses of the MA programme over four semesters must be core courses.

**(ii) Elective Courses:** Elective courses shall be courses offered by the parent department that impart instructions in specialized/advanced/supportive aspects of the relevant discipline. Each department shall offer a pool of such courses from which a student can choose. Elective Courses shall be for six credits. The syllabus for each elective course will have a preamble clearly stating the course and the learner objectives for the elective, along with the pre-requisites if any and a detailed list of references.

**(iii) Interdisciplinary/Cross Disciplinary Courses (I/C courses):** I/C courses shall be offered by parent department and departments other than parent department. One 'course basket' shall be created for the same. Each MA program has to offer a minimum of two courses and maximum of four courses in the basket. Every I/C course shall be for six credits. A student may opt for an I/C course offered by his/her parent department.

**(iv) Audit Courses:** Students can audit a course from the parent department as well as from other departments in addition to the core, elective and I/C courses that are mandatory, with the prior permission of the head/s of the relevant department/s. Such a student will have to apply in writing at most a week after the relevant course has commenced. For the audit course, a student shall attend lectures of the audited course. The student cannot appear for the semester-end examination for the audited course. However, the student shall appear for the





internal examination/assessment. The audit course appears on the mark-sheet only when the student passes the internal assessment with minimum 50% marks, failing to which, the student cannot claim the audit for that course. The internal marks shall not be displayed on final mark-sheet. The internal marks shall not be used for the credit computation. A student is permitted to audit maximum four courses in the MA program.

**(v) Ability Enhancement Course:** The ability enhancement courses are skills based course. The ability enhancement courses are to be offered at fourth semester.

**(vi) Project based courses:** Project based courses shall consist of a dissertation. Each dissertation course will carry 10 credits. Every learner shall choose one project based course.

## **2: Rules for programmes not having a practical component**

**2.1:** Four core courses shall be offered in semesters 1 and 2 each.

**2.2.** Five elective courses shall be offered in the third semester. No other courses will be offered in the third semester.

**2.3.** The fourth semester shall consist of one ability enhancement course, one interdisciplinary/cross disciplinary courses (I/C courses) and one project based course.

**2.4.** Each department will offer at least one I/C course during semester 4. The learner can choose any one course from this basket, including the course offered by his/her parent department. The preamble to this course will clearly specify the prerequisites for this course.

**2.5.** A learner will have to apply to the relevant department in writing no later than two weeks after the commencement of the fourth semester for taking the I/C course offered by that department.

**2.6.** A learner can relinquish an I/C course chosen by him/her no later than two weeks after the commencement of the fourth semester by applying to the Head of the Department whose I/C course the student wishes to opt for. The application will have to be endorsed by the head of the Department whose I/C course the student has relinquished and the Head of the parent department.

**2.7.** The Head of the Department offering a specific I/C course will convey the marks of the internal examination obtained by students taking the course to the Head of the parent department before the commencement of the end semester examination of the parent department.





**The Outline:** Each course in the category of Elective Course/Ability Enhancement Course/Interdisciplinary/Cross-disciplinary Course shall be of 100 marks and out of that 40 marks shall be allocated for internal assessment and the remaining 60 marks shall be allocated for semester end examination. Each will have 6 Credits.

The Project based courses shall be of 100 marks consisting of a dissertation. Each dissertation course will carry 10 Credits. The criteria for evaluation will be as per the university guidelines.

[For further details see the Choice Based Credit System—Regulations of the University of Mumbai]

<b>Elective Courses: Semester III</b>			
Sr. No			
<b>I</b>	<b>Elective I</b>	<b>Course Code</b>	<b>Paper No.</b>
1	Poetry from Chaucer to the Present	PAENG301	Paper I- A
2	English Language Teaching	PAENG301	Paper I- B
<b>II</b>	<b>Elective II</b>		
1	Gendered Perspectives on Literature	PAENG302	Paper II- A
2	Nineteenth Century American Literature	PAENG302	Paper II- B
<b>III</b>	<b>Elective III</b>		
1	New Literatures in English	PAENG303	Paper III -A
2	Twentieth Century American Literature	PAENG303	Paper III -B
<b>IV</b>	<b>Elective IV</b>		
1	Shakespeare	PAENG304	Paper IV-A
2	Modern Indian Fiction in English	PAENG304	Paper IV- B
<b>V</b>	<b>Elective V</b>		
1	Postcolonial Literature	PAENG305	Paper V- A
2	Indian Writing in Translation	PAENG305	Paper V-B
<b>Ability Enhancement Courses: Semester IV</b>			
1	Creative Writing	PAENG306	Paper I-A
2	Translation: Theory and Practice	PAENG306	Paper I-B





3	Research Methodology	PAENG306	Paper I- C
4	English for Academic and Commercial Purpose	PAENG306	Paper I-D
<b>Interdisciplinary/Cross-disciplinary Courses: Semester IV</b>			
1	Film and Literature	PAENG307	Paper II-A
2	Cultural Studies	PAENG307	Paper II-B
3	Media Studies	PAENG307	Paper II-C
4	Political Reading of Literature	PAENG307	Paper II-D
<b>Project Based Courses [Topics/Areas]</b>			
1	Comparative Literature	PAENG308	Paper III-A
2	Re-reading Canonical Texts	PAENG308	Paper III-B
3	Language and Literature	PAENG308	Paper III-C
4	Film Appreciation	PAENG308	Paper III- D
5	Art and Literature	PAENG308	Paper III- E
6	Study of Popular Culture	PAENG308	Paper III- F
7	Subaltern in Literature	PAENG308	Paper III-G
8	Literature and Environment	PAENG308	Paper III-H
9	Gendered Reading of Literature	PAENG308	Paper III-I
10	Literature of Diaspora	PAENG308	Paper III-J
11	Queer and LGBT Studies	PAENG308	Paper III-K
12	Folk Literature	PAENG308	Paper III-L
13	Mythology	PAENG308	Paper III-M
14	Spirituality and Literature	PAENG308	Paper III-N
15	Journalism and Literature	PAENG308	Paper III-O
16	Marginality and Protest in Literature	PAENG308	Paper III-P



### Details of Course and Credit Structure:

Semester	Nature of Course	No of Courses	Total Credit
I	Core Course	04	4X6=24
II	Core Course	04	4X6=24
III	Elective Course	05	5X6=30
IV	Ability Enhancement Course	01	06
	Interdisciplinary/Cross Disciplinary Course	01	06
	Project Based Course	01	10
Total No. of Credit: 100			

*Shakale*  
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**AC - 14/06/2018**

**Item No. 4.71**

# **UNIVERSITY OF MUMBAI**



**Program : M.Sc.**

**( Choice Based Credit System )**

**Course : M.Sc. Organic Chemistry**

**Part - I**

**Syllabus for Semester III & IV**

**(To be implemented from the Academic year 2018-2019 )**





**Course Code: PSCHOOC-II 404**

**PAPER – IV: RESEARCH METHODOLOGY**

**Unit 1:**

[15L]

**Print:**

[5L]

Primary, Secondary and Tertiary sources.

**Journals:**

Journal abbreviations, abstracts, current titles, reviews, monographs, dictionaries, text-books, current contents, Introduction to Chemical Abstracts and Beilstein, Subject Index, Substance Index, Author Index, Formula Index, and other Indices with examples.

**Digital:**

[5L]

Web sources, E-journals, Journal access, TOC alerts, Hot articles, Citation Index, Impact factor, H-index, E-consortium, UGC infonet, E-books, Internet discussion groups and communities, Blogs, preprint servers, Search engines, Scirus, Google Scholar, ChemIndustry, Wiki-databases, ChemSpider, Science Direct, SciFinder, Scopus.

**Information Technology and Library Resources:**

[5L]

The Internet and World wide web, Internet resources for Chemistry, finding and citing published information.

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**Unit II: DATA ANALYSIS**

[15L]

**The Investigative Approach:**

Making and recording Measurements, SI units and their use, Scientific methods and design of experiments.

**Analysis and Presentation of Data:**

Descriptive statistics, choosing and using statistical tests, Chemometrics, Analysis of Variance (ANOVA), Correlation and regression, curve fitting, fitting of linear equations, simple linear cases, weighted linear case, analysis of residuals, general polynomial fitting, linearizing transformations, exponential function fit, r and its abuse, basic aspects of multiple linear regression analysis.

**Unit III: METHODS OF SCIENTIFIC RESEARCH AND WRITING**

[15L]





## SCIENTIFIC PAPERS

Reporting practical and project work, Writing literature surveys and reviews, organizing a poster display, giving an oral presentation.

### **Writing Scientific Papers:**

Justification for scientific contributions, bibliography, description of methods, conclusions, the need for illustration, style, publications of scientific work, writing ethics, avoiding plagiarism.

## Unit IV: CHEMICAL SAFETY & ETHICAL HANDLING OF CHEMICALS

[15L]

Safe working procedure and protective environment, protective apparel, emergency procedure, first aid, laboratory ventilation, safe storage and use of hazardous chemicals, procedure for working with substances that pose hazards, flammable or explosive hazards, procedures for working with gases at pressures above or below atmospheric pressure, safe storage and disposal of waste chemicals, recovery, recycling and reuse of laboratory chemicals, procedure for laboratory disposal of explosives, identification, verification and segregation of laboratory waste, disposal of chemicals in the sanitary sewer system, incineration and transportation of hazardous chemicals.

### REFERENCES:

1. Dean, J. R., Jones, A. M., Holmes, D., Reed, R., Weyers, J., & Jones, A., (2011), *Practical skills in Chemistry*, 2<sup>nd</sup> Ed., Prentice Hall, Harlow.
2. Hibbert, D. B. & Gooding, J. J. (2006) *Data Analysis for Chemistry* Oxford University Press.
3. Topping, J., (1984) *Errors of Observation and their Treatment* 4<sup>th</sup> Ed., Chapman Hill, London.
4. Harris, D. C. (2007) *Quantative Chemical Analysis* 6<sup>th</sup> Ed., Freeman Chapters 3-5
5. Levie, R. De. (2001) *How to use Excel in Analytical Chemistry and in general scientific data analysis* Cambridge University Press.
6. Chemical Safety matters – IUPAC-IPCS, (1992) Cambridge University Press.
7. OSU Safety manual 1.01

## **Semester IV: Practicals** **Course code: PSCHO4P1**

### **Two steps preparations**

1. Acetophenone → Acetophenone phenyl hydrazine → 2-phenyl





- indole.
- 2-naphthol  $\rightarrow$  1-phenyl azo-2-naphthol  $\rightarrow$  1-amino-2-naphthol.
  - Cyclohexanone  $\rightarrow$  cyclohexanone oxime  $\rightarrow$  Caprolactum.
  - Hydroquinone  $\rightarrow$  hydroquinone diacetate  $\rightarrow$  2,5-dihydroxyacetophenone.
  - 4-nitrotoluene  $\rightarrow$  4-nitrobenzoic acid  $\rightarrow$  4-aminobenzoic acid.
  - o*-nitroaniline  $\rightarrow$  *o*-phenylene diamine  $\rightarrow$  Benzimidazole.
  - Benzophenone  $\rightarrow$  benzophenone oxime  $\rightarrow$  benzanilide.
  - o*-chlorobenzoic acid  $\rightarrow$  N-phenyl anthranilic acid  $\rightarrow$  acridone.
  - Benzoin  $\rightarrow$  benzil  $\rightarrow$  benzilic acid.
  - Phthalic acid  $\rightarrow$  phthalimide  $\rightarrow$  anthranilic acid.
  - Resorcinol  $\rightarrow$  4-methyl-7-hydroxy coumarin  $\rightarrow$  4-methyl-7-acetoxy coumarin.
  - Anthracene  $\rightarrow$  anthraquinone  $\rightarrow$  anthrone.

**(Minimum 8 experiments)**

**Note:**

- Students are expected to know (i) the planning of synthesis, effect of reaction parameters including stoichiometry, and **safety aspects including MSDS** (ii) the possible mechanism, expected spectral data (IR and NMR) of the starting material and final product.
- Students are expected to purify the product by recrystallization, measure its mass or volume, check the purity by TLC, determine physical constant and calculate percentage yield.

**Course code: PSCHO4P2**

**Session-I: Combined spectral identification: Interpretation of spectral data of organic compounds (UV, IR, PMR, CMR and Mass spectra).**

A student will be given UV, IR, PMR, CMR, and Mass spectra of a compound from which preliminary information should be reported within first half an hour of the examination without referring to any book/reference material. The complete structure of the compound may then be elucidated by referring to any standard text-book/reference material etc **(Minimum 8 spectral analysis).**

**Session-II: Project evaluation**

**References for Practicals**

- Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis- V. K. Ahluwalia and Renu Aggarwal, Universities Press India Ltd., 2000
- Advanced Practical Organic Chemistry- N. K. Vishnoi, Third Addition, Vikas Publishing House PVT Ltd
- Systematic Laboratory Experiments in Organic Synthesis- A. Sethi, New Age International Publications
- Systematic Identification of Organic compounds, 6th edition, R. L. Shriner, R. C. Fuson and D.Y. Curtin Wiley, New York.
- Vogel's Textbook of Quantitative Analysis, revised, J. Bassett, R. C. Denney, G. H. Jeffery and J. Mendham, ELBS
- Experiments and Techniques in Organic Chemistry, D. Pasto, C. Johnson and M. Miller, Prentice Hall





7. Macro-scale and Micro-scale Organic Experiments, K. L. Williamson, D. C. Heath.
8. Systematic Qualitative Organic Analysis, H. Middleton, Adward Arnold.
9. Handbook of Organic Analysis- Qualitative and Quantitative, H. Clark, Adward Arnold.
10. Vogel's Textbook of Practical Organic Chemistry, Fifth edition, 2008, B.S. Furniss, A. J. Hannaford, P. W. G. Smith, A. R. Tatchell, Pearson Education.
11. Laboratory Manual of Organic Chemistry, Fifth edition, R K Bansal, New Age Publishers.
12. Organic structures from spectra, L. D. Field, S. Sternhell, John R. Kalman, Wiley, 4<sup>th</sup> ed., 2011.

1. The candidate is expected to submit a journal and project certified by the Head of the Department /institution at the time of the practical examination.
2. A candidate will not be allowed to appear for the practical examination unless he/she produces a certified journal or a certificate from the Head of the institution/department stating that the journal is lost and the candidate has performed the required number of experiments satisfactorily. The list of the experiments performed by the candidate should be attached with such certificate.
3. Use of non-programmable calculator is allowed both at the theory and the practical examination.

*Shakode*

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& Science College, Vaibhavwadi



Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi

## ACTIVITY REPORT

### Dept. of Zoology

ACADEMIC YEAR	2023-24
Activity No.	Zoo 2023-24-02
Name of the Activity	Excursion study tour
Date	27 Jan. 2024
Time	One day
Visited places	1) Ratnagiri 2) Devrukh
Organized by	Dept. of Zoology
Co-ordinator	Zoology Dept.
Activity for College/Class/Group	Zoology students
No. of Beneficiaries	24
Nature:  Academic/Co-curricular/Extra- curricular/Extension	Academic
Objectives of Activity	<ul style="list-style-type: none"><li>• To study marine animal diversity</li><li>• To study animal husbandry</li><li>• To understand entrepreneurial opportunities in zoology</li></ul>
Outcome	The students visited vermicomposting, Goat farming, apiculture at Devrukh. They visited Gadre Marine fisheries and studied different marine animal species.
Feedback Analysis	Students enjoyed tour.

HOD/Chairperson/Coordinator

*Skakade*  
Principal  
PRINCIPAL

ANANDIBAI RAORANE ARTS, COMMERCE  
& SCIENCE COLLEGE, VAIBHAVWADI





Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi

## Department of Zoology

14th Dec. 2023

### Excursion notice

All the students are informed that our Excursion is scheduled to Ratnagiri and Devrukh on 27th Jan. 2024. For that, students should register their names with Dr. N. R. Hedulkar by paying rupees 450 per student. Further information will be provided in next week.

HOD, Department of Zoology

Anandibai Raorane College Vaibhavwadi

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**Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi**  
**Department of Zoology**

**Study Excursion Report 27/01/2024**

On January 27, 2024, study excursion was organized on behalf Department of Zoology of Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi. On January 27, at 7:30 am, the ST bus departed from Vaibhavwadi with teachers of Zoology Department and first, second and third year students of B.Sc. Zoology. In this study excursion, various places were visited and every possible thing was studied there. First we visited Shri Pranav Panwalkar's captive goat farming, beekeeping and vermicomposting business at Devrukh. He had raised captive goats in the best way. He also prepared vermicompost from goat dung. He informed and explained the entire project to the students in a good manner. Many business opportunities available in this sector were explained by him. He gave information about the goat breeding business and the means of production from which many breeds of goats are produced. He used the knowledge of zoology he acquired to create a great business, which also inspired the students.

After that we reached Ratnagiri to visit a unit of Gadre Marine Export Private Limited. This company is a well-known company in the fishery industry in India and the Asian continent. In this company, fish is imported after checking the quality and it is processed and many products are made from it. These products are sold in international markets. This company carries many products and their main product is Crabstick. During this, the machinery production houses in the company were shown to all the students. We also saw the sample products of his company.

In the mid of the excursion, we visited the Marine Biological Research Center Aquarium and Museum at Ratnagiri. Many species of fishes can be seen and studied in this museum. Different types of fish and turtles could be seen here. Also, the skeleton of Whale Fish is kept in the museum here, we also saw it. Many species of marine life in the world are stored here. We could see and study it.

Finally we reached Bhatye Beach. While studying the marine biodiversity, the climate, marine life and the economy running on it were taken into consideration. About 23 students of department of Zoology accompanied by 3 staff members were participated in this study excursion.





*Vermicomposting Unit at Devrukh*



*Entrance at Marine Biological Research Center Aquarium and Museum at Ratnagiri.*





Gadre Marine Export Private Limited



Marine specimen collection at Bhatye Beach, Ratnagiri

Dr. N.R. Hedulkar

Chairman, Science Association

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& SCIENCE COLLEGE, VAIBHAVWADI



Permission letter



Date: 15 Jan. 2024

Dr. N. R. Hedulkar  
Department of Zoology

To,

The Principal

Anandibai Raorane College of Arts, Commerce and Science College,  
Vaibhavwadi, 416810

**Subject: Regarding permission for Excursion**

Respected Sir

I am Dr. N. R. Hedulkar, Head, Department of Zoology would like to inform you that the Excursion of our department for the academic year 2023 - 24 has been organized on 27th January 2024 at Ratnagiri and Devrukh. During the Excursion, students will be shown Animal farming, Exotic birds, Apiculture unit, Fishery industry, University campus, Marine diversity, Ratnagiri aquarium and Tibha point. A total of 27 people including 24 students and 3 teachers are participating in this trip to visit.

I request you to grant us permission for this trip. A list of all the participating students and teachers going on the trip is attached along with this letter.

Thanking you

Yours faithfully

Dr. N. R. Hedulkar

*Permitted*  
*25/1/24*



ANANDIBAI RAORANE ARTS, COMMERCE AND SCIENCE COLLEGE, VAIBHAVWADI

Department of Zoology

Excursion at Devrukh and Ratnagiri, Date: 27/01/2024

List of student participants



Sr. No.	Name of the student	Class	Signature	Mobile No.
1.	<del>Shingade Pallavi Janardan</del> <del>Sutar Sanket Vijay</del>	TYBSc.	<del>Shingade</del>	8275132825
2.	<del>Sutar Sanket Vijay</del> <del>Shingade Pallavi Janardan</del>	-11-	<del>Sutar</del>	9356056371
3.	Mane Pranay Pratap	-11-	Mane	9607051848
4.	Karangutkar Ankita Eknath	-11-	Ankita	9373516273
5.	Narkar Shrutika Sharad	-11-	Narkar	7057494800
6.	Chavan Rushikesh Mahesh	SYBSc.	Chavan	9404890242
7.	Tambe Sanika Santosh	-11-	Tambe	9226598185
8.	Teli Yash Santosh	FYBSc.	Teli	9922358055
9.	Gurav Divya Anant	-11-	Gurav	8275073164
10.	Jadhav Harshal Vilas	-11-	Jadhav	9021035563
11.	Kadam Shamburaj Yuraj	-11-	Kadam	7391900404
12.	Lohakare Karuna Krishna	-11-	Lohakare	7588663559
13.	Mer Priyanka Pradip	-11-	P.P-Mer	8265051934
14.	Faras Malika Azim	-11-	Malika	7020759181
15.	Jambhavadekar Tanvi Sandip	-11-	J	7498751461
16.	Patekar Aradhya Santosh	-11-	Patekar	9405579438
17.	Desai Rituraj Vijay	-11-	Desai	9370457122
18.	Dhavade Karan Subhash	-11-	K.S.D	9359179136
19.	Pawar Prachi Sitaram	-11-	Pawar	7823870135



[illegible]

HOD, Zoology