



GOVT. MADHAV SCIENCE P.G.COLLEGE UJJAIN

Presents

1st Student Research Internship Programme in Chemistry
Under PURE (PURsult OF Research Excellence)

Organized by: CEQIC(Cluster for Enhancing Quality through Innovation and Collaboration)

Coordinated by: P.G.Department of Chemistry and Pharmaceutical Chemistry

Supported by: Internal Quality Assurance Cell

Sponsored by: Janabhagidari Samiti of the College

It's just the beginning join us





Principal's Address.....

While signing and endorsing this report, I would like to congratulate CEQIC unit of the college and P.G. Department of Chemistry and Pharmaceutical Chemistry for the successful organization of very first Student Research Internship programme of it's kind. I would also like to take this opportunity to express my gratitude to Department of Higher Education Govt. of M.P. Bhopal, all the stakeholders who have supported the College in all its endeavors since inception. In particular, I wish to thank the distinguished Chairperson and members of the Janabhagidari Samiti who have made enormous contributions, specifically in the form of financial support. I also wish to thank State Bank of India Ujjain and Canara Bank for the support extended by them. I also appreciate the hard work of the able team of teachers, support staff and students for the valuable contribution by each one of them, had made this Internship possible. Above all, thanks to Almighty God for all the blessings that have enabled the realization of this dream, which will indeed give a life-long inheritance for the young generations from the Cluster Colleges. On behalf of the entire community of Govt. Madhav Science P.G.College Ujjain, I wish to invite comments, suggestions and any valuable contributions from the readers of the Report. This will go a long way in enabling the College achieve its goal of improving social welfare through provision of high quality all-round education to the youth.

Dr. Usha Shrivastava
Principal
Govt.Madhav Science P.G.College Ujjain

From Nodal Officer's Pen.....

It gives me a feeling of immense satisfaction and humility while writing this Report of first ever Science Research Internship for P.G.students of Cluster Colleges. My sincere thanks are due to Department of Higher Education Govt. of M.P. Bhopal for starting this ambitious Scheme of cluster colleges. I want to take this privilege to thank all the participant colleges who could make up to first ever student Research Internship organized at Ujjain. I would also like to congratulate and thank students who became witness to this rare event of Science practice. I will be shirking my duties if I do not express my gratitude to the Inspiration and support rendered by the Principal of the college Dr. (smt.)Usha Shrivastava ,financial support extended by Janabhagidari Samiti of the College, State Bank of India Ujjain and Canara Bank Ujjain. Young budding student scientists coming across the state made this academic endeavor memorable, which carved a niche in the heart and mind of not only students, but we as teachers could also feel the rush of adrenaline in us. The whole event meticulously flowed through lectures to Lab sessions to discussions to Project Hypothesis submission. Feedback session encouraged College administration to plan such programmes in the near future too. Internship opened a window of opportunity to students coming from other fine Higher Educational Institutes of the state, to know that as an institution we are destined to the bright future. Internship ignited pleasure and satisfaction in me that we are on a path to create a future full of optimism and enthusiasm, a future where every endeavor will succeed and ineptitude and disillusionment will be something of the past. However I may want to add that a little patience and sobriety will help to see us through. We should Remember that chicks are not hatched by breaking the eggs; they take time and hatch. I request all the readers of the report to please send their precious suggestions and comments to me, so that we may incorporate them in the future programmes and make them even better

Dr. Kalpana Virendra Singh

Nodal Officer CEQIC

Singhkalpana297@gmail.com

9713389538

Mentors.....

- **Dr.Ajay M.Chaturvedi**.....Professor and Head Department of Chemistry, Govt.Madhav Science P.G.College
- **Dr.Neelam Kapil**Professor Department of Chemistry, Govt.Madhav Science P.G.College
- **Dr. Arpan Bhardwaj**Professor Department of Chemistry, Govt.Madhav Science P.G.College
- **Dr. Shakuntala Pandey**...Professor Department of Chemistry, Govt.Madhav Science P.G.College.
- **Dr Manmeet K. Makkad.** Professor Department of Chemistry, Govt.Madhav Science P.G.College .
- **Smt.Pratibha Namdeo** Asstt. Professor Department of Chemistry, Govt.Madhav Science P.G.College
- **Dr.Kalpana V.Singh**.....Asstt. Professor Department of Chemistry, Govt.Madhav Science P.G.College.
- **Dr. D. S. Raghuvanshi**.....Asstt. Professor Department of Chemistry, Govt.Madhav Science P.G.College .
- **Dr.J. S. Solanki**Asstt. Professor Department of Chemistry, Govt.Madhav Science P.G.College.
- **Dr.Shobha Shouche**Asstt. Professor Department of Zoology, Govt.Madhav Science P.G.College .
- **Dr.Mamata Thakur**.....Professor Chemistry Symbiosis University of Education Indore

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“Research Internship in Chemistry”

CEQIC Initiative

3rd to 5th November 2016

Report

Three day research internship programme was organized as a CEQIC (cluster for enhancing quality through innovation and collaboration) initiative. Programme was coordinated by P.G. Department of Chemistry and Pharmaceutical Chemistry and sponsored by Janabhagidari samiti of the college, programme was supported by IQAC of the college. Financial support was also provided by the SBI Ujjain in the form of Kits. Canara bank Ujjain also sponsored refreshment in the internship. Out of 12 Cluster participant colleges 09 colleges participated in the Internship programme (List of colleges attached Annexure 01). Three colleges did not participate in the programme (Annexure 2.). 41 students registered and participated in the internship programme (Annexure 3).

The Internship was organized as a very ambitious activity of **CEQIC Cell of the college**, Christianized as **PURE** expanding up to **P**ursuit of **R**esearch **E**xcellence

Over view of PURE

PURE is perceived as a 3 day Student Internship programme, as conducted by DST for school students (INSPIRE). Programme will cater to top 1% bracket of students studying in various universities / colleges of the state. Students will be allotted mentors, who will help students find out their area of interest in fundamental subjects and provide them pathway for excellence in their higher studies and research. It's an activity designed specifically for cluster Colleges, but can be taken up for other colleges in the second step. The activity will escalate students through lectures, Exhaustive discussions and general lab sessions to specific lab sessions in and outside the lab and institution (educational tours).

Emphasis will be on interactive lectures and lab sessions. Full care will be taken to judge and enhance peer group dynamics and mentor-mentee relationships. The student resource thus generated can be utilized by their parent Institute to carry forward the message among their peers.

Aim: To prepare a focused team of young researchers, who have chartered their paths towards excellence.

Origin of the Problem:

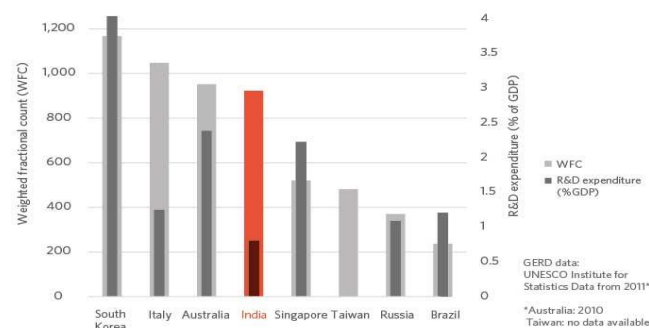
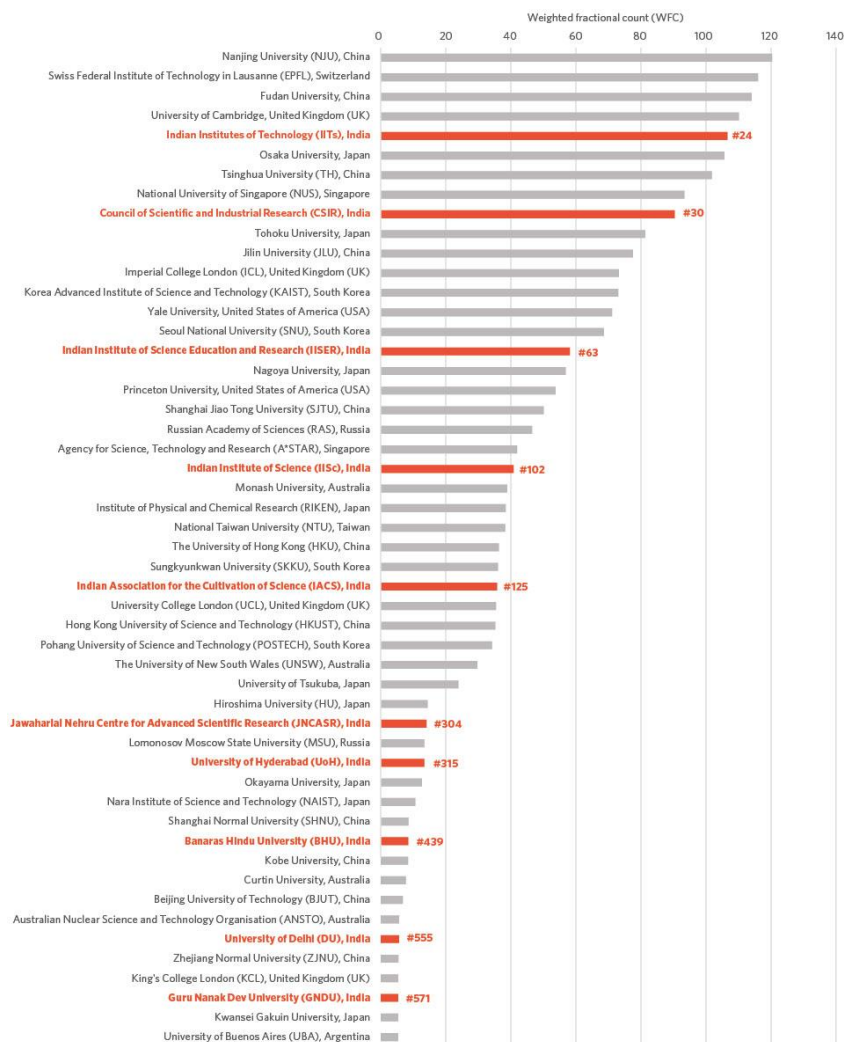


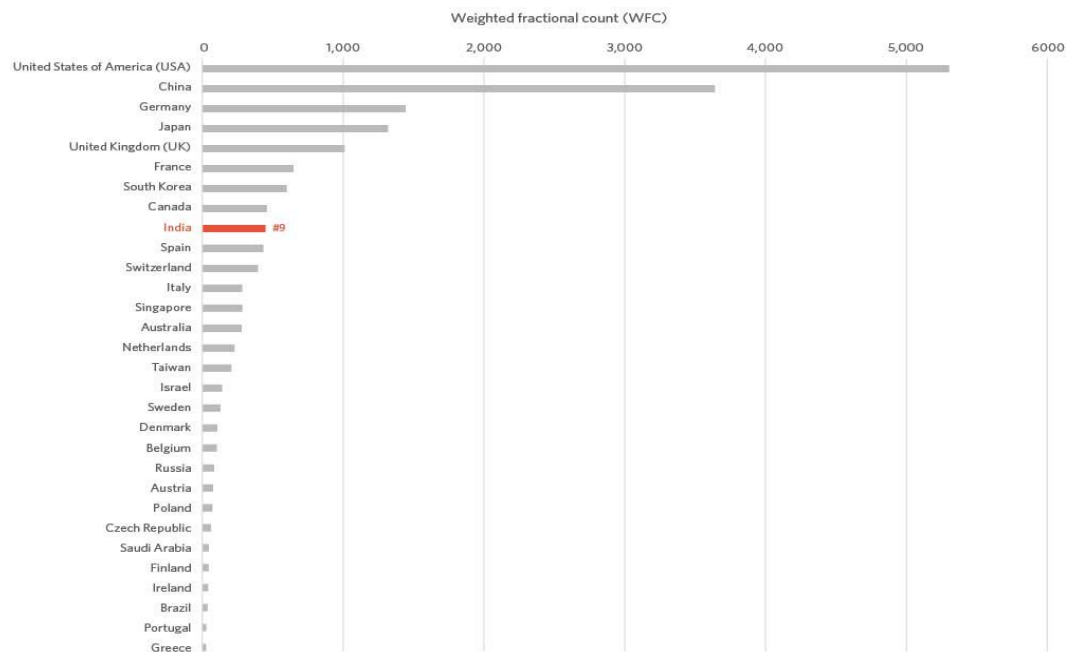
Figure 1: R&D expenditure and overall output in the Nature Index 2014 | India's R&D spending as a percentage of its GDP is relatively low compared to other nations with a similar output in the Nature Index 2014. India's marked growth sets it apart from the comparator countries considered in this study. Of these countries, only Russia experienced a similar increase in growth rate, although its weighted fractional count (WFC) is less than half of India's (Fig.1).

Figure 2 Indian institutions are highly ranked in Chemistry | This graph shows Indian institutions in the context of a selection of well-recognized global institutions in the field of chemistry. Indian institutions are rubbing shoulders with many global leaders in the Nature Index. Global institutional ranks are for chemistry WFC output in the Nature Index for 2014.



In Chemistry, India's top institutions are competitive with those in Europe, the USA and Asia, and stand up to be counted among the world's top ranks (Fig.2). India is ninth (WFC = 448.9) in the index global ranking for Chemistry. Not surprisingly, the top-ten journals where Indian scientists publish are all in chemistry and the physical sciences, with 50 per cent of India's overall Nature Index output coming from chemistry alone (Fig.3)

Figure:3



Looking at the above scenario published in Nature India. Country is moving successfully towards research in Chemistry, good research is being published in quality journals. CEQIC unit of the college conceived PURE to give brilliant P.G. Students coming from different cluster colleges, an overview of recent research areas in Chemistry. Students with the knowledge about recent research areas will be more focused and prepared to give their best to research.

Methodology:

The first Internship programme in Chemistry was conceptualized based upon five major ethos of PURE

- Lectures
- Lab sessions
- Exhaustive Discussions
- Project Hypothesis
- Feed back

Process Flow:

All the participants were divided randomly into 3 groups, Group dynamics was ensured through heterogeneity amongst groups

- Venkatraman Group
- APJ Kalam Group
- CNR Rao Group

For the facilitation of students and for maintaining group dynamics four professors from Chemistry Department of the College were assigned the authorities of Group Coordinators

Sr. No.	Name of Group	Name of Group Coordinator
1.	Venkatraman Group	Dr. Shakuntala Pandey
2.	APJ Kalam Group	Dr. Neelam Kapil Dr. Manmeet K. Makkad
3.	CNR Rao Group	Dr. Pratibha Namdeo

Groups

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graph TD; Groups[Groups] --- Group1[Group 1  
Venkatraman group  
1. IEHE Bhopal  
2. Chhatarpur  
3. Sagar]; Groups --- Group2[Group2  
APJ Kalam Group  
1.Holkar Science Indore  
2.Hoshangabad  
3. Shahdol]; Groups --- Group3[Group 3  
CNR Rao  
1. Ujjain  
2.Jijabai Indore  
3.Bhopal  
Sarojini];
```

Group 1

Venkatraman group

1. IEHE Bhopal
2. Chhatarpur
3. Sagar

Group2

APJ Kalam Group

- 1.Holkar Science Indore
- 2.Hoshangabad
3. Shahdol

Group 3

CNR Rao

1. Ujjain
 - 2.Jijabai Indore
 - 3.Bhopal
- Sarojini

Schedule.....

Accommodation :Hotel Avantika near Nanakheda Bus Stand Ujjain.....

Day 1.

Registration...1000-1030 hrs Registration Desk... Pharmaceutical Chemistry class Room

Orientation of students...1030-1130 hrs. venue: Room no 18

Inauguration1200-1245hrs. Venue: Conference Hall

Visit to departments

Group 1...

Chemistry/ Pharma.....1130-1145 hrs.

Botany/ Biotechnology.....1145-1200 hrs.

Zoology/Microbiology/Bioinformatics.....1250 – 1310 hrs

Group 3...

Botany/ Biotechnology1130-1145 hrs

Zoology/Microbiology/Bioinformatics1145-1200 hrs.

Chemistry/ Pharma1250 – 1310 hrs

Lunch 1310 -1400hrs.

Feed Back.....1700-1720 hrs

Group 2...

Zoology/Microbiology/Bioinformatics1130-1145 hrs

Chemistry/ Pharma1145-1200 hrs

Botany/ Biotechnology 1250 – 1310 hrs

Academic Lecture Session

Scope of research in Chemistry...1400 -1430 hrs (Dr. Shubha Jain)

Research Methodology.....1440—1540 hrs.(Dr. M.S.Parihar)

Spectroscopy an overview 1540- 1700 hrs.

(Dr. Ajay Charturvedi , Dr.Kalpna V.Singh, Dr.Arpan Bhardwaj)

Day 2

Morning Session

Group 1.

CS Lab

Cheminformatics:

Lab session: CS Lab

**Theory and Practicals: 1000-1300 hrs.
hrs.**

Feed Back.....1300-1315 hrs.

Afternoon Session

Group 1.

Venue New M.Sc.Lab

UV Visible

Lab session: M.Sc.Lab

Theory and Practicals: 1400 - 1700 hrs.

Tea Break...1515 -1525 hrs

Feedback.....1700-1720 hrs.

Group 2.

M.Sc. Class Rroom new Building

Infra Red Spectroscopy

M.Sc. Class Rroom new Building

Tea Break...1115 -1125 hrs

Group 2.

CS Lab

Cheminformatics:

Lab session: CS Lab

Group3.

Venue New M.Sc.Lab

UV Visible

Lab session: New M.Sc.Lab

Lunch.....1300-1400

Group3.

M.Sc. Class Rroom

Infra Red Spectroscopy

M.Sc. Class Rroom

Day 3

Morning Session

Group 1.

M.Sc. Class Room new

Infra Red Spectroscopy

Lab session M.Sc. Class Room new

**Theory and Practicals: 1000-1300 hrs.
1400hrs.**

Feed Back...1300-1315 hrs

Afternoon Session

Group 1.

Group3.

Feed back session and discussion 1400 hrs to 1530 hrs.

Submission of written reports/ Project hypothesis by groups and Individual Records by students

Valedictory and certificate distribution 1530 hrs. to 1700 hrs.

Group 2.

New M.Sc.Lab

UV Visible

M.Sc.Lab

Tea Break...1115 -1125 hrs

Group 2.

Group3.

CS Lab

Cheminformatics:

CS Lab

Lunch.....1300-

Schedule.....

Orientation “Research Internship Programme” Venue Room No.18

- Entry Behaviour of participants 1030-1035 hrs by Dr. Kalpana V. Singh
- General Introduction of activity by Dr. Kalpana V. Singh 1035 -1050 hrs
- Introduction of Group Managers 1050-1100 hrs by Dr.Kalpana V.Singh
- Know your Schedule and Labs Dr. Kalpana V. Singh 1100-1110 hrs
- Writing the Lab Manual by Dr. Neelam Kapil 1110-1120 hrs
- Submission of Research Project by Dr. Manmeet K. Makkad & smt. Pratibha Namdeo 1120-1130 hrs.

Inaugural Session November 3rd

Chief Guest: Sh. Sanket Bhondave District Collector Ujjain Chairperson Janabhagidari

Presided over by: Dr. Usha Shrivastava Additional Director Higher Education Ujjain Region.

Chief Guest, Sh. Sanket Bhondave District Collector Ujjain “Students should be torch bearers for basic research, whatever is done in the labs should come back to society in a way or other.” He asked the students to help competent authorities in soil testing of agricultural land, this will enable farmers to know their land better and help them in improving the fertility of their soil through addition of proper manure and fertilizers

Chairperson of the Inaugural ceremony Dr. Usha Shrivastava Inspired students and asked them to make full use of the opportunity by paying attention to all the academic as well as interactive sessions.

Academic Session 1: November 3rd

Speakers

Dr.Shubha Jain, Professor of Chemistry School of Studies in Chemistry and Bio Chemistry Vikram University Ujjain.

Topic “Scope of Research in Chemistry”

Dr.M.S.Parihar, Professor and Head School of Studies in Zoology and Biotechnology Vikram University Ujjain.

Topic “Research Methodology”

Explained students how a good Hypothesis can be conceived and converted in to high quality Research. He used real life examples from his research during different time intervals, while working at OHIO University PENNSYLVANIA U.S.A.

Academic Session 2: November 3rd

Over view of Spectroscopy

Electromagnetic Radiations: General terms/ Concepts. Inter Conversion of different parameters . Electromagnetic Spectrum and its Range. By Dr. Ajay Chaturvedi Head Department of Chemistry

Microwave Spectroscopy : Rigid rotator, Different types of molecules, Energy of rigid rotator, selection rule, Isotopic Effect, Population of energy states. Non rigid rotators and their energy By Dr. Kalpana Virendra Singh

UV Spectroscopy: UV Radiations, Different types of excitations, regions of UV spectra, different types of shifts, Chromophores, auxo chromes By Dr.Arpan Bhardwaj

Academic Session3: November 4th

Over view of Spectroscopy

Infra Red Spectroscopy: Rigid rotator, Vibrations in bonds bending stretching vibrations, Molecule as Harmonic and anharmonic oscillator, Overtones, Hot bands, Combination bands and Fundamental vibrations. Energy of Oscillator, Zero point energy and Morse Potential. By Dr.Kalpana Virendra Singh

Infra Red Spectroscopy: Interpretation of IR Spectra effect of bonds and substitutions on IR Spectra By Dr. Arpan Bhardwaj

Academic Session 4: November 4th

Utility of pure thinking and Personality Development: Sh Choure Assistant General Manager State Bank of India Ujjain Region

Academic Session 5: November 4th

Chem Informatics: An Important and budding area of Chemistry Research. Importance of QSAR in Pure Chemistry Research. How to develop Hypothesis and convert it into structure based drug designing By Dr. Mamta Thakur Professor Chemistry, Symbiosis University Indore.

Academic Session 6: November 5th

Thinking out of Box, Green Chemistry: By Dr. Brijesh Pare Professor Chemistry, Govt. P.G.College Shujalpur.

Lab Sessions 1& 2 on 4th November Lab Session 3 on 5th November

Manual attached for practicals. Every Student completed his/her manual and got it signed from Lab In charge and group coordinator

Lab Incharge and Associates

Chem informatics Theory/Practicals Team(responsible for designing lab experiments)

- Dr.Kalpana Virendra Singh & Dr.Shobha Shouche
- Assistance: Sh. Pradeep Saini & Sh. Ravikant Yadav
- Technical Assistance: Sh.Sudarshan Shishulkar

UV/Vis Theory/ Practicals Team(responsible for designing lab experiments)

- Dr. Ajay Chaturvedi, Dr. Neelam Kapil , Dr.Arpan Bhardwaj
- Assistance: Sh. Veer Singh Berde, Km Priyanka Khare

FTIR Theory/Practicals team(responsible for designing lab experiments)

- Dr.Arpan Bhardwaj, Dr.Deependra Singh Raghuvanshi, Dr.Jeeven Singh Solanki
- Assistance: Smt. Komal Chelaramani, Km.Shruti Sharma, Km.Namrata Vyas &
- Mr.Susheel Gour(Ex.Technician and service engineer Lab India)

Project Hypothesis Submission and Feedback 5th November

Participants were advised to submit a project Hypothesis at the end of Internship. Students were advised to pick up project topics from the research areas learnt during the Internship.

All the participants submitted Project Hypothesis, well conceived and thought. Hypothesis have been submitted to expert review committee. Selected hypothesis will be academically supported to be developed in to full detailed projects. The selected students could be facilitated in the form of summer Internship at IIT Indore.

Feedback mechanism was one of the best part of the Internship, Feedback obtained is helpful for the Institution as well as for the participants. The positive feed back obtained enhanced the spirit of the host Institute and let gear for next endeavor.

Valedictory Ceremony 5th November

Ceremony was chaired by Additional Director Higher Education Ujjain Region Dr.Usha Shrivastava

Chief Guest of the ceremony was Dr.B.K.Mehta Professor and Head School of studies in Chemistry and Biochemistry Vikram University Ujjain

List of Participating Cluster Colleges

1. Govt. Holkar Science College , Indore
2. Govt. Jija Bai Girls P.G. College, Indore
3. Institute of Excellence in Higher Education , Bhopal
4. Govt. Sarojini Naidu Girls P.G. college, Bhopal
5. Govt. Narmada P. G. College ,Hoshangabad
6. Govt. Girls P.G. College ,Saugor
7. Govt. P.G. College, Shahdol
8. Govt. Maharaja P.G. College , Chhatarpur
9. Govt. Madhav Science P.G. College, Ujjain

List of Colleges who could not make up..

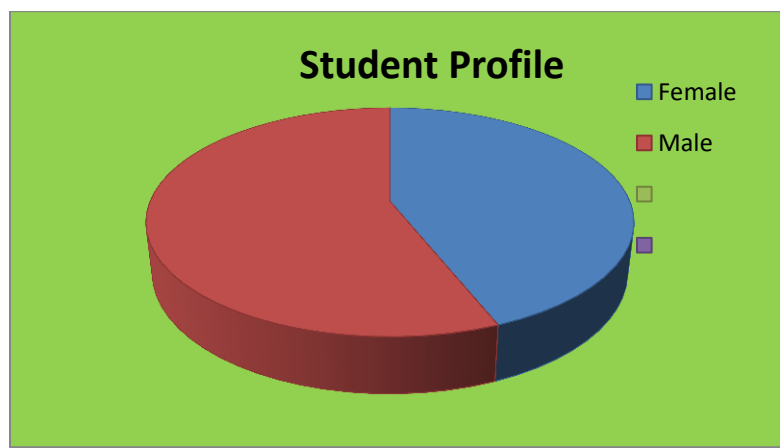
- 1.KRG Gwalior
2. Model Science College Jabalpur
3. TRS College Rewa

List of Participating Students

➤ Total Number of students....41 Female Students.....18, Male Students.....23

Sr.No.	Name of the Institute	Name of the Student	Class
1.	Institute of Excellence in Higher Education Bhopal	Sh. Anubhav Jain	M.Sc.III sem
2	Institute of Excellence in Higher Education Bhopal	Km.Greeshma Jain	M.Sc.III sem
3	Institute of Excellence in Higher Education Bhopal	Sh.Sanket Nayak	M.Sc.III sem
4	Institute of Excellence in Higher Education Bhopal	Km.Shubhangani Tiwari	M.Sc.III sem
5	Institute of Excellence in Higher Education Bhopal	Km. Ritu Singh	M.Sc.III sem
6	Institute of Excellence in Higher Education Bhopal	Km. Rajeshwari Tiwari	M.Sc.III sem
7.	Sarojini Naidu Govt.Girls'P.G.College Bhopal	Km.Kavita Mehra	M.Sc.III sem
8	Sarojini Naidu Govt.Girls'P.G.College Bhopal	Km. Ketki Verma	M.Sc.III sem
9.	Govt. Maharaja College Chhatarpur	Sh. Arvind Nishad	M.Sc.III sem (Phy.)
10.	Govt. Maharaja College Chhatarpur	Sh. Nitin Tiwari	M.Sc.III sem
11.	Govt. Maharaja College Chhatarpur	Sh.Devendra Vishwakarma	M.Sc.III sem
12.	Govt. Maharaja College Chhatarpur	Sh. Mahesh Kushwaha	M.Sc.III sem
13.	Govt. Maharaja College Chhatarpur	Sh. Manoj Kumar Mishra	M.Sc.III sem(Phy.)
14	Govt. Narmada P.G.College Hoshangabad	Sh. Prakash Uikey	M.Sc.III sem
15	Govt. Narmada P.G.College Hoshangabad	Sh.Bastiram Dhurve	M.Sc.III sem
16	Govt. Narmada P.G.College Hoshangabad	Sh.PremNarayan Ashware	M.Sc.III sem
17	Govt. Narmada P.G.College Hoshangabad	Sh.Nikesh Sahu	M.Sc.III sem
18	Govt. Autonomous Holkar Science P.G.College Indore	Sh.Aman Kakne	M.Sc.III sem
19	Govt. Autonomous Holkar Science P.G.College Indore	Sh.Sudhanshu Mishra	M.Sc.III sem
20	Govt. Autonomous Holkar Science P.G.College Indore	Km.Arпита Gova	M.Sc.III sem
21	Govt. Autonomous Holkar Science P.G.College Indore	Sh Amit Gupta	
22	Govt. Autonomous Holkar Science P.G.College Indore	Sh Rajesh Chougad	M.Sc.III sem
23	Govt. Autonomous Holkar Science P.G.College Indore	Sh Gopal Prasad Carpenter	M.Sc.III sem
24	Govt. Autonomous Holkar Science P.G.College Indore	Sh Rohit Dubey	M.Sc.III sem
25	Mata Jijabai Govt. Girls' P.G.College Indore	Km.Krupali Labde	M.Sc.III sem
26	Mata Jijabai Govt. Girls' P.G.College Indore	Km. Monika Parmar	M.Sc.III sem
27	Mata Jijabai Govt. Girls' P.G.College Indore	Km.Jasmit Kaur Bhatia	M.Sc.III sem
28	Govt. Girls' P.G.College of Excellence Sagar	Km.Priyanka Rao	M.Sc.III sem

29	Govt. Girls' P.G.College of Excellence Sagar	Km.Ritu Baderiya	M.Sc.III sem
30	Govt. Girls' P.G.College of Excellence Sagar	Km.Sivani Soni	M.Sc.III sem
31	Govt. Girls' P.G.College of Excellence Sagar	Km.Indira Prajapati	M.Sc.III sem
32	Pt.S.N.S.Govt. P.G.College Shahdol	Sh Sachit Kumar Tripathi	M.Sc.III sem
33	Pt.S.N.S.Govt. P.G.College Shahdol	Sh Anurag Bari	M.Sc.III sem
34	Pt.S.N.S.Govt. P.G.College Shahdol	Sh. Makhan Lal Saket	M.Sc.III sem
35	Pt.S.N.S.Govt. P.G.College Shahdol	Sh. Vikas Kumar Mongre	M.Sc.III sem
36	Govt. Madhav Science P.G.CollegeUjjain	Sh.Rahul Suryavanshi	M.Sc.III sem
37	Govt. Madhav Science P.G.CollegeUjjain	Km. Harshita Shukla	M.Sc.III sem
38	Govt. Madhav Science P.G.CollegeUjjain	Km. Shanu Shreemal	M.Sc.III sem
39	Govt. Madhav Science P.G.CollegeUjjain	Km. Swati Silodia	M.Sc.III sem
40	Govt. Madhav Science P.G.CollegeUjjain	Km. Swati Bhadoria	M.Sc.III sem
41	Govt. Madhav Science P.G.CollegeUjjain	Sh.Vasudev Soni	M.Sc.III sem



List of Support Material Supplied

1. Kit Inclusive of

- Back Pack (LapTop & General Utility Bag)
- Writing Pad
- Laboratory Manual (attached separately)
- List of Books (4.1)
- Feed Back forms for all sessions(4.2)
- Project Hypothesis Submission form(4.3)
- Student Identity Card(4.4)

2.e Content inclusive of spectroscopy overview lectures

3. Cheminformatics freeware on demand

- ACD Sketch
- SPDBV
- Autodock
- CYGWIN
- Chimera
- Introduction to online Docking Server

List of Books on Spectroscopy

1. Spectrometric Identification of Organic Compounds Paperback – 21 Jul 2015
by Francis X. Webster, David J. Kiemle, David L. Bryce Robert M. Silverstein
2. Organic Spectroscopy Dec 2008 by William Kemp
3. Quantum Chemistry and Spectroscopy Paperback – 2007 by Thomas Engel (Author), Philip Reid
4. Understanding NMR Spectroscopy Paperback – 19 Dec 2013 by James Keeler
5. Modern Infra red Spectroscopy by B Stuart (2005)
6. Infra red spectroscopy Biological applications (2008) B Stuart
7. Handbook of Molecular Spectroscopy Nov 2015 by D. N. Sathyanarayana
8. NMR Spectroscopy: Basic Principles, Concepts and Applications in Chemistry Paperback – 12 Oct 2010 by Harald Gunther
9. Modern spectroscopy by J. Hollas
10. Fundamentals of Molecular Spectroscopy 2016 by Banwell
11. Spectroscopy of Organic Compounds May 2016 by P. S. Kalsi
12. Molecular Structure and Spectroscopy (Second edition) 2007 by Aruldas
13. Introduction to Magnetic Resonance Spectroscopy ESR, NMR, NQR 30 Nov 2013 by D. N. Sathyanarayana
14. Symmetry and Spectroscopy of Molecules April 2009 by K. Veera Reddy

Training Evaluation Form***Student Research Internship Programme*****Under PURE(Pursuit of Research Excellence) Component of CEQIC**

Date of Presentation:.....

Presenter's Name:

Topic or Session:.....

Please complete the evaluation for today's training session – your feedback is valuable to us and is appreciated. Govt. Madhav Science P.G. College Ujjain is committed to continual improvement and suggestions will be considered for future training needs.

Criteria	Strongly agree 4	Agree 3	Disagree 2	Strongly Disagree 1	Not Applicable 0
Training was relevant to my needs					
Materials provided were helpful					
Length of training was sufficient					
Content was well organised					
Questions were encouraged					
Instructions were clear and understandable					
Training met my expectations					
The presenter and / or presentation was effective					

1. What did you enjoy most today?

2. What did you learn today that you anticipate using in your future academic activities?

3. How will you implement this into your future academic activities and in what timeframe?

General Comments: Thank you for taking the time to help us improve our training.

.....

Name of the student

.....

Name of the Institute

Project Hypothesis Submission Form.....**Student Research Internship Programme in Chemistry****3rd -5th November 2016**

Title of the Project.....

.....

Name of the Student Investigator.....

Complete Address.....

Phone Number.....Mobile number.....

Email id.....

Name and address of the Institute where work is to be carried.....

Phone Number.....

Email id.....

Name of the Institutional Guide.....

Phone number.....Mobile number.....

Email id.....

Name of the mentor.....

Objective.....

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Brief Introduction

.....
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Methodology.....

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Name and Signature of Group Manager

Place:

Date:

Name and Signature of Student

Place:

Date:

Photo Gallery



Outside the Venue and Chem informatics lab

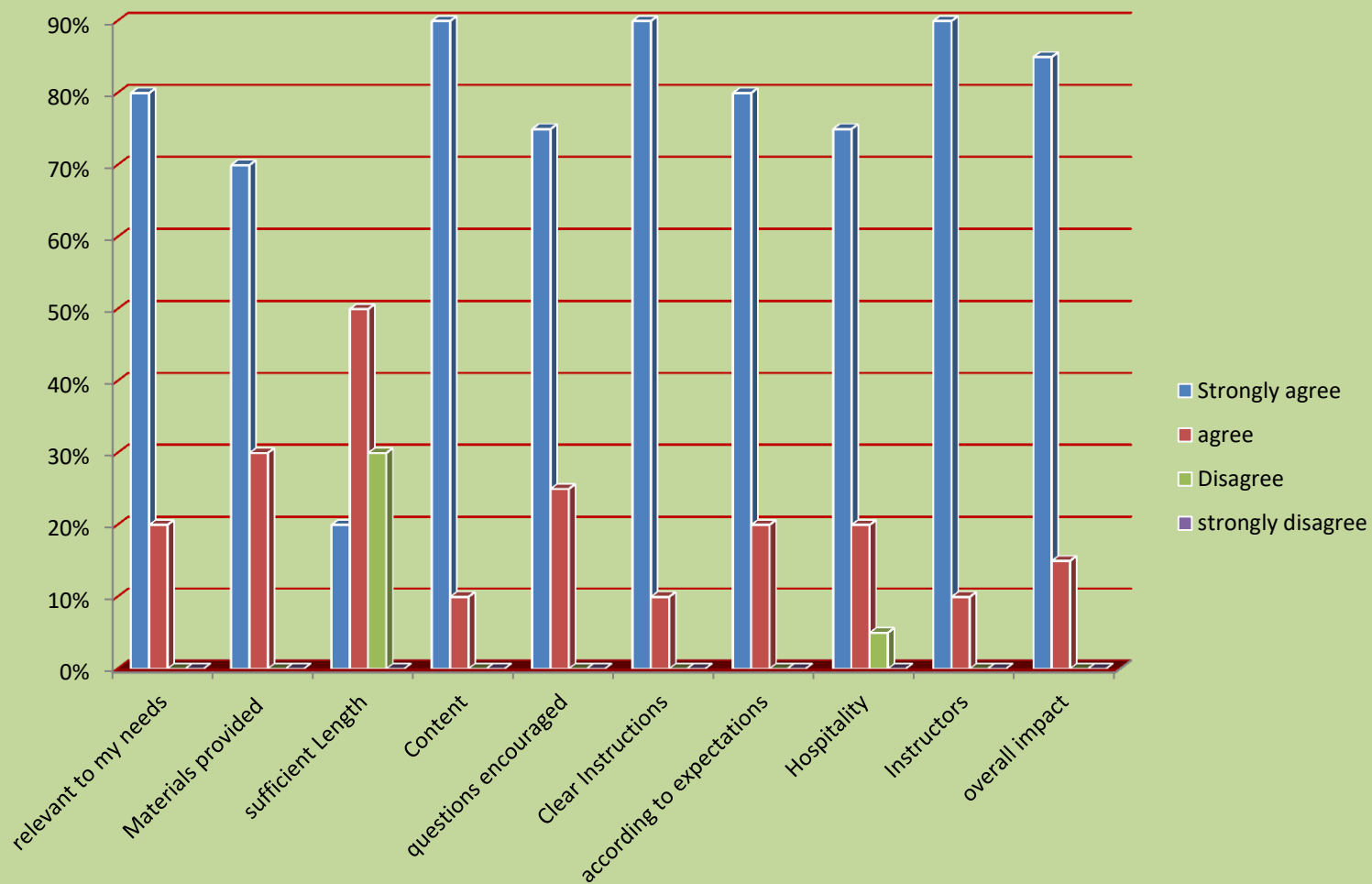


Lab Sessions IR and UV



Lunch Hours.....

Feed Back Received from Participants.....



Feed Back Analysis

- Feedback was received on following points
- Relevance of training to the needs of the participant
- Materials provided to participants
- Length of the training
- Content of the training
- Whether questions were encouraged during training
- Understandability of the instructions
- Whether training met the Expectations of the trainers
- Hospitality
- Quality of the Instructors
- Overall Impact

Host Institute got overwhelming response to all ligands 80% to 90% of the participants answered that they strongly agree by the ligand

10% to 20% agreed to the ligand

30% of the students wanted the training to be of 5 to 7 days, they found the duration to be short to comprehend all academic sessions

A very small fraction of students 5% reported that hospitality could be improved by incorporation of variants in the meals. However every participant appreciated the hygiene maintained.

Challenges faced/ Constraints.....

➤ **Budget:**

- There was no budget provision from department.
- Budget was provided by Janabhagidari Samiti of the college, which was not adequate.
- Support provided by SBI and Canara Bank in the form of training kits and overhead expenses
- For future cluster endeavors we suggest that budget should be sanctioned

➤ **Heterogeneous nature of students**

- However it took training to even more heights

➤ **Festival Time**

- Training rubbed shoulders with Deepawali, a major festival observed by all in the state. Deepawali vacations were there till 01st November. Faculty of the Host Institute , specifically of Chemistry department has to sacrifice their Deepawali vacations, but it was worth

➤ **Duration of the Training**

- Training was constrained up to 3 days because of budget constraints, in the future endeavors if the budget is sanctioned duration could be increased from 3 to 5 days, that will make the training more exhaustive