



Department of Biochemistry

University of Delhi South Campus

Best Practices in Department of Biochemistry

Course curriculum (M.Sc.) associated practices

- 1. Providing hands-on training** - True to the spirit of experimental science, the course in M.Sc. Biochemistry uniquely offers students ample scope for hands-on training. The entire emphasis of the course is thus more on hands-on training rather than didactic lectures only. In semesters I and II, students work in a dedicated well-equipped laboratory (for practicals) undergoing all classical and advanced practicals over six days a week for the entire duration of the semester. The amount of time devoted for practicals, we believe, is among the highest for our students. Each student performs every practical with their own hands and we do not encourage demonstration based practicals at all. Each teacher of the department supervises practical classes directly and help them perform practicals in their area of research expertise so that the level of practicals are of research quality. Emphasis is given for students to learn the principle behind each practical, the experimental design, concept of controls, analysis of results and record keeping. Since research is also often team work, the practice is also to let students work as a team for some practical experiments. One stand-out practice followed in the department is to not always emphasize on positive results in an experiment, but to help students analyze why experiments failed, since such knowledge prepares them better for challenges in research, where one learns from failures. The department also dedicates extramural funding from specialized grants like the UGC-SAP grant to acquire sophisticated instruments that can be used by Master's students as well to boost their confidence and enhance their employability.
- 2. Imparting comprehensive and connected practical courses** – Another practice followed in the department is to have students perform practicals that are interconnected and comprehensive, such that one practical leads to another in a logical design and students in a years' time covers the entire gamut of biochemistry experiments from the most basic ones to the most advanced one. We shun the use of practicals that are stand alone or independent. This helps students undertake research project in a more prepared manner in the second year. Since biological data has expanded exponentially over the years, handling such data using computational means is very important for students to learn. Hence the practice is to weave in bioinformatics based practicals as well.
- 3. Providing opportunity for dissertation / research project** – Students are allowed to work on a specific research project in a specified laboratory in the department under the direct supervision of a faculty for an entire year and this practice has held the department and the

students in good stead for years. This practice allows students to prepare better for the rigors of scientific research. In addition, the departmental practice is also to let M.Sc. students presents posters on their work and attend scientific meetings and conferences. M.Sc. students in the department have also been authors on peer reviewed international papers and reviews and book chapters. The year long experience helps them to decide whether to take up research as career option.

4. **Development of oratory and scientific presentation skills through seminars by students –** Another practice that has defined the department is open seminars by the students, one each in two semesters. The students are given current and important topics by the faculties related to their course curriculum but in advanced areas of research at the beginning of the semester (not one single technique or a single paper but an entire research area). Students review the research area related to the topic, collate the information and present the most relevant information in the form of an hour long seminar discussing the background, the seminal experiments, the scope of research and future perspectives. This practice helps students inculcate value of self-learning while still being guided by a faculty. They learn how to search literature, how to read scientific papers, how to collate information. They get trained in the art of presentation and public speaking. This practice helps co-curricular learning by going beyond the text books into the realm of scientific world. This practice allows them to apply the principles of biochemistry learnt in class.
5. **Development of writing skills –** In addition to empowering students in the art of experimental science and oratory skills, the practice in the department is also to empower them with writing skills. For the same, the seminars that they present in two semesters are also needed to be followed up by write-ups in the form of term papers at the end of the semester. While it allows them to learn the tricks in the art of using softwares such as MS Word, MS Excel, Sigma Plot, Origin, EndNote etc., it enables them with the skill of writing scientific findings. This skill is further enhanced when they also write their dissertation thesis. In addition, the department also follows the occasional practice of organizing essay writing competition among students.
6. **Providing platform for interfacing to the scientific world –** Another important practice followed in the department is creating platform for students to interface with the scientific world outside the department. This is done through seminars by external experts at regular interval and by organizing departmental symposiums. These events allow students to interact with experts and to get an idea as to the recent developments in life sciences research. The practice is also to organize poster presentation and science quiz competitions to foster interaction and boost confidence in students. Such practice also nurtures the ability to ask questions in seminars and comprehend advanced areas of research so that the classroom lectures gain significance. It allows teachers to observe whether their teaching in various courses has borne fruit as expected in each course outcome.
7. **Knowledge enhancement through educational trips or excursions –** Yet another practice that is followed in the department to nurture wholesome development of the students is annual educational trips or excursions. Such trips allow students to interact with teachers of the department, the scientists of other institutes and among themselves in a more relaxed

environment. This allows facile assimilation of knowledge, while also helping to build better understanding and team work among the members of the department.

8. **Development of organizational skills through extra-curricular activities** – Another practice in the department towards development of wholesome personalities is organization of diverse extra-curricular activities. These activities are self-governed by students under the watchful eyes of the faculties. Students organize several such activities like freshers' welcome, teachers day, diwali-rangoli competition, sports day, farewell bash, etc. that are well attended and participated by all department members. These events help students develop social skills, management skills, organization skills, leadership skills and team work. The practice allows expansion of their mindspace and develops sensitivity towards gender and diversity issues. It allows them to resonate with others.
9. **Regular teacher-student direct interactions** – The favorable teacher-student ratio allows for direct interaction of students with teachers on a daily basis. The teachers are accessible to students and they get opportunities for frequent one-one interaction that allows beyond the class interactions. Such a practice also allows the chances of counseling students. The students get opportunities for career related discussions and the teachers can easily pass on information about research positions in other universities and Institutions thus mimicking the role of placement cells.
10. **Feedback mechanisms** – The department follows the practice of feedback seeking from students, alumni and external expert for course curriculum, syllabus and other aspects of the department. The suggestions are used to revise courses time to time.

Research related practices

1. **Ethical Practices** - The students and faculty members observe very high standards in respect of ethics for publication, use of animals for research, biosafety etc. Any project involving radioactivity is monitored by departmental radiation safety officer. Every departmental member is regularly exposed to procedures to safeguard any type of malpractices.
2. **No tolerance to Plagiarism and infringement on intellectual property rights (IPR)** - All the laboratory supervisors ensure that the research work undertaken under their guidance and supervision is original. They also ensure that the work is carried out by the student(s) themselves. For writing the thesis/reports/scientific manuscripts the supervisors ensure that these are original writings. Plagiarism is avoided at all costs using appropriate softwares and alertness by supervisors. Wherever appropriate research findings are protected by IPR and it is ensured that we do not infringe on others' IPRs. These issues are taught as part of Ph.D course work as well.
3. **Ethical clearances** - It is also ensured that all research projects are routed through appropriate committees like Institutional Bio-safety Committee (IBSC), Animal ethics committee and Institutional Ethics Committee.

4. **Good laboratory practice (GLP)** - The supervisors ensure that Good Microbiological Practices (GMP) and Good Laboratory Practices (GLP) are followed during research including the P3 level containment practices as and when appropriate.
5. **Bio-waste management** - The department follows proper protocols for bio-waste management, which are collected in appropriate containers marked for their contents and safely disposed through government approved agency. Bio-waste management is regularly done in the department through Delhi Pollution Control Committee (DPCC) approved agency. The campus has placed bins at several specific points where waste can be segregated before disposal of both Biodegradable and Non-biodegradable waste. Smoking is prohibited. Rain water is harvested. Trees and plantations are taken good care of.

Other practices

1. **Accessibility to Computer for all** – Computers are accessible to teachers, students and non-teaching staff in the department at a ratio of 2:1. The computers are also enabled with internet access.
2. **Internal committees for general governance** – Several committees are in place and they are announced on the website.
3. **Strong Alumni base maintained** – website; strong bonds with several alumni; often invited to deliver seminars or interact with current batch of students; feedback obtained.
4. **Humanitarian efforts** – Department is maintained like a family, help each other in financial needs, health emergencies, collection of funds for personal, local or national crisis; several manpower on extramural grants that help the poor and needy to earn enough to provide for basic needs of their families.
5. **Go Green efforts** – We minimize the use of Xeroxing and printing by encouraging the use of scanners and emails to circulate regular notifications, handouts to students, maintaining softcopies of important documents in the office.

Head of the Department