

Certificate Course

Name of the Department - Centre for Medical Biotechnology

Name of the Course - Laboratory Animal Experimentation

(Revised as per Formative Assessment guidelines)

Purpose: The program is proposed for the capacity building of students, to educate them on the nutrition, housing, restraining and management of laboratory animals.

Mode: The program will be run in Regular mode.

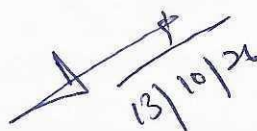
Duration of the Course: Six months.

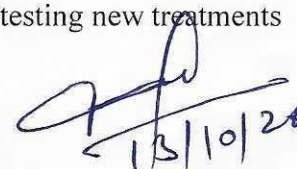
Initial intake Capacity: 20 Students

Laboratory animal experimentation plays a crucial role in scientific research and the development of new treatments, drugs, and medical procedures. Here are some key points highlighting the importance of laboratory animal experimentation:

1. **Human Health and Medicine:** Laboratory animals, such as mice, rats, rabbits, and non-human primates, are used to study diseases, test new drugs, and develop medical treatments. Animal models provide valuable insights into the physiological, genetic, and behavioral aspects of various diseases, allowing researchers to better understand human conditions and develop potential therapies. Animal studies help identify drug safety and efficacy, dosage levels, potential side effects, and treatment protocols before testing them on humans.
2. **Biomedical Research:** Animals are utilized to advance our understanding of biological processes, such as embryonic development, organ function, immune responses, and genetics. These studies contribute to the development of new diagnostic tools, therapies, and preventive measures. For example, animal research has been instrumental in the development of vaccines, antibiotics, surgical procedures, and medical devices.
3. **Safety Testing:** Laboratory animals are used to assess the safety and potential hazards of new chemicals, cosmetics, consumer products, and environmental factors. Animal testing helps evaluate the toxicity, allergenicity, and potential side effects of substances, ensuring human and environmental safety. However, there is increasing emphasis on reducing and refining the use of animals in safety testing and exploring alternative methods.
4. **Veterinary Medicine:** Laboratory animal research also benefits veterinary medicine. Animals serve as models for studying animal-specific diseases, testing new treatments


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and procedures, and advancing veterinary care. Such studies contribute to improving the health and welfare of animals.

It's important to note that ethical guidelines and regulations govern the use of laboratory animals to ensure their welfare and minimize any potential suffering. The scientific community is also actively working on reducing the use of animals in research through alternative methods, such as in vitro studies, computer simulations, and human cell-based models, whenever possible.

This course is particularly suitable for students who wish to learn the laboratory animals experimentation. The course will include theory and simulations of practical needed to learn the correct way of doing animal experiments. This course will train the students in understanding the basic biology of laboratory animals, humane treatment during experiments and obtaining actual results for human welfare.

In this course, the students will learn the principles of 3 R's in the field of laboratory animals. The course will provide an opportunity for University students to learn the correct technique of handling & restraining of laboratory animals. Here, it is quite pertinent to mention that even sacrificing of lab animal at the end of experiments has to be painless and merciful.

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Syllabus of Certificate Course on 'Laboratory Animal Experimentation'

Course Code	24 CC-CMBT1	Course Credits	(L: 2 T:0 P: 0)
Max. Marks	50	Examination	Formative assessment - 2 credit theory*
Learning Objectives: 1. To educate the students on the needs, concepts and principles of laboratory animal experimentation 2. To give students virtual experience of injections and surgical procedures 3. To give students experience with anesthesia and analgesia in laboratory animals. 4. To provide students the current guidelines of CPCSEA regarding animal experimentation 5. To educate the students about the alternatives to animal usage			
Learning Outcomes: The students will develop 1. A holistic perspective of designing and execution of laboratory animal experiments 2. An understanding of the principles of anesthesia and analgesia 3. Understanding how to care and manage laboratory animals 4. Information on 3 R's principle in laboratory animal field 5. Alternatives to lab animal research			
Unit - I			
Introduction and scope of Animals in biomedical research, General biology and taxonomy, CPCSEA and IAEC regulatory guidelines, Ethics in Lab animal research, 3 R concept in experiment designing, Alternatives to animal use, Biology and husbandary of laboratory mice, rat & rabbit, Sterilization and disinfection technique, Biosafety and occupational hazzard			
Unit – II			
Mice, Rat, Rabbit handling and restraining methods, Different injections techniques, Blood collection techniques, Anesthesia and analgesia, Euthanasia methods, Animal acquisition and maintenance of records, Accreditation of animal facilities			
Suggested Readings: 1. Essentials of Laboratory Animal Science: Principles and Practices, Edited by P. Nagarajan, Ramachandra Gudde, Ramesh Srinivasan Springer Singapore, January 2021 978-9-81-160986-2, 978-9-81-160987-9 10.1007/978-981-16-0987-9 2. Handbook of Laboratory Animal Science Essential Principles and Practices Edited ByJann Hau, Steven J. Schapiro CRC Press 9780429439964 https://doi.org/10.1201/9780429439964 3. A Manual for Laboratory Animal Management By (author): Jonathan David Ward (Biomedical Research Consultants Pte Ltd) https://doi.org/10.1142/6682 4. Guide For The Care And Use Of Laboratory Animals, Committee for the Update of the Guide			

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for the Care and Use of Laboratory Animals Institute for Laboratory Animal Research Division on Earth and Life Studies, The National Academies Press, USA

5. The Clinical Chemistry of Laboratory Animals By Judith S. Prescott CRC Press 9781420091144, 142009114X

6. Laboratory Animals Pocket Reference Set, CRC Press, ISBN 9780367261504

***Formative Assessment Criterion for two credits theory**

	Marks distribution
Written test (2 X 10)	20
Class assignments / Case study / Mini project (2 X 5)	10
Quiz / seminar / Group discussion / Debate (2 X 7.5)	15
Attendance	05
Total	50

