

Dr. B. R. AMBEDKAR OPEN UNIVERSITY

Prof. G. Ramreddy Marg, Jubilee Hills, Hyderabad - 500 033. Centre for Internal Quality Assurance (CIQA)



Best Practice

SCIENCE EDUCATION – CENTRAL LAB FACILITIES AT UNIVERSITY CAMPUS

B R A O U about the university

The University, initially known as Andhra Pradesh Open University, was set up on 26th August 1982 through an Act of the A.P. State Legislature (APOU Act 1982). Subsequently, the University was renamed as Dr. B.R.Ambedkar Open University on 26 October, 1991 by the Government of Andhra Pradesh. The establishment of this University, the first of its kind in India, heralded an era of affirmative action on the part of the Government of Andhra Pradesh to provide opportunities of higher education to all sections of society to meet the changing individual and social needs. The University offers services to defense personnel, prison inmates and learners from remote and tribal areas who are not having access to education. All the programmes offered by the University are recognised by the University Grants Commission, New Delhi. The motto of the University is "EDUCATION FOR ALL". The university is adapting all the latest ICTs regarding teaching, learning and evaluation to reach the unreached.



- Enrichment of on-going academic programmes.
- Competency building through education and training programmes. Interactive individual-based teaching learning processes.
- Reliable and credible student evaluation systems.
- Result-oriented, accountable and transparent administrative and logistic support systems. and
- Research, innovation, training and networking for system development and staff development.



Dr. B. R. Ambedkar's social philosophy of education as a means of creating an egalitarian society is the vision of this University. Access to relevant, quality education and training programmes for diverse sections of society with a focus on hitherto deprived sections at lower costs by using the modern technologies in teaching-learning processes as well as in administrative and support services is the goal of this University. The University programmes aim at making education and training instruments for living and for making a living.

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The Science and Multimedia Laboratory (STML) is a primary laboratory facility that the University built to foster a scientific mindset in learners under ODL. STML helps students grasp concepts, principles, and laws as well as increase their aptitude for further education and scientific research.

The objectives of the practice:

- 1. To foster experimental and investigation skills in science students at U. G. and P.G. Levels.
- 2. To provide learners with hands-on experience in preferred laboratory settings to promote scientific knowledge.
- 3. To foster purposeful inquiry learning among students of all scientific fields.



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- 4. To successfully handle the curriculum aspects of scientific teaching as well as the learning requirements of ODL system science students by providing them with professional education and the necessary infrastructure and technical facilities.
- 5. To incorporate laboratory training into teaching-learning, instruction, and assessment.
- 6. To encourage a culture of science and to foster aptitude for scientific research and higher education.
- 7. To aid students in becoming accustomed to Research Design, Analysis, and Data Interpretation.
- To nurture an awareness of self-learning among students by teaching them how to design and conduct experiments and the associated skills of observation, research, reporting, analysis, and data interpretation.
- To make science education in ODL System a viable proposition, where quality issues and curricular issues are given importance by making laboratory experience mandatory in the curriculum.

The Context

The establishment of Dr. B.R. Ambedkar Open University in 1982 heralded an era of affirmative action to provide opportunities for higher education with flexible entry, low cost, and upward mobility to members of all sections of society pursuing higher education, and science education was no exception.

The science departments were founded on the presumption that practical training in a laboratory would be necessary for science teaching and learning. This training is qualitatively equivalent to comparable practical training sessions in conventional universities, giving the student confidence in the instruction they receive and

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enabling them to pursue higher education in conventional institutions in the field of science.

All students enrolled in science programs must choose a minimum of two science subjects and a maximum of three science subjects to be eligible for a degree in science and must complete 192 hours of lab instruction in each field over six semesters. The laboratory instruction comprises primarily demonstration experiments, watching video experiments, and carrying out some easy home experiments.

The Practice

In 1995, all departments in the science faculty created central laboratories on the University campus, and the science departments have since conducted practical classes and examinations for science students from the twin cities and adjacent areas. The University sanctioned Science and Technology Multi-Functional Laboratory (STML) with lab equipment in 2007 to offer practical classes for all science topics. The remaining labs are equipped with instruments that correspond to the syllabus, as well as the necessary specimens, apparatus, charts, and so on.

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In 2017, Dr. B. R. Ambedkar Open University adopted the Choice-Based-Credit-System (CBCS), which assigned credits for practical training in scientific subjects. The lab manuals for B.Sc. programs are available in both English and Telugu, and they are well-designed and illustrated. They also include required exercises that contain the theories and principles used in experiments, which are important components of experimental design and the sequential steps used. In addition, the university's multimedia approach, which includes videos, preserved film material, slides, charts, overhead projector use, etc., aids in the students' successful laboratory experiences.

The laboratory experience at Dr. B.R.A.O.U. is limited in duration yet required so that personnel working in scientific labs, science, and technology-oriented organizations, and software companies can profit alongside ordinary students.

The CBCS course curriculum is now comprised of two (2) discipline-specific optional courses per year, as well as two skill



enhancement courses in each Science topic, for a total of ten (10) courses per science subject. All the subsequent courses (08), apart from skill enhancement courses, require



practical training in each Science subject. With the introduction of CBCS, students of Mathematics and Statistics are now required to complete practical training. Computer Science students additionally receive 192 hours of practical instruction over their three-year degree program.

All science disciplines (Botany, Zoology, Physics, and Environmental Science) at the P.G. level have 144 hours of practical



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instruction split over 16 days, except Chemistry, which has 160 hours. Nearly 6000 undergraduate students and 1000 postgraduate learners are trained at the university's science labs each year. All the lab exercises aid in the student's comprehension of scientific ideas and their development of practical skills and knowledge. Early in the semester, the students receive well-designed lab manuals that assist them in understanding and actively participating in the laboratory sessions.

Evidence of Success

The university's science programs have benefitted numerous students who are now working as engineers, doctors, technicians, medical lab technicians, primary teachers, people in the armed forces, DRDO, and pharmaceutical firms like Reddy Labs as well as other companies like Infosys, TCS, and HCL. They were able to apply the experimenting and research abilities they had developed in the lab to their chosen careers. The fact that more students are enrolling in postgraduate scientific programs at the university over the past five



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years is evidence that the quality of the science curriculum and labbased instruction meets the needs of both society at large and science learners. For science students, the lab experience has been a fulfilling exercise as a result of individualized attention and practical instruction in handling equipment and completing experiments.

The success of science teaching is evident from the following recognitions attained by the University:

- B.Sc. programs Ranked No.1 among India's best distance learning institutions – 2011 - by "Careers 360" of Outlook magazine.
- Indus Foundation Award for Education Excellence 2012 under the distance education category.
- CSR top distance learning of India award 2013 and 2014.

Problems encountered and Resources required

Teaching diverse student groups with a variety of backgrounds, skills, and abilities can be difficult for science teachers, but with the aid of lab facilities, manuals, and careful planning, they can get beyond these obstacles. In Telugu, English, and Urdu media, 10 practical manuals are prepared for each subject.

During Covid-19 Pandemic, practical training sessions were delivered through Zoom online demonstrations and video classes.

Discipline-wise amenities need to be improved further in Science labs. Full-fledged research labs need to be developed with sophisticated equipment. Funding of research and collaborations with other R&D organizations and financial sponsorships need to be actively pursued by the university for gaining a stronghold in the research community. One additional challenge that needs to be addressed urgently is the training of staff in ICT.



The pedagogy in ODL universities differs from that of traditional universities. Planning and designing science courses without impeding professional standards, gaining recognition for science programs by instilling the principles of scientific endeavor through lab experiences, and co-opting students in pursuit of both scientific and distance education goals, and succeeding in such an attempt is no small feat in and of itself.

Dr. BRAOU has been successful in achieving the objectives of science education. By establishing high-quality science labs at the main campus, attempts to improve science education have been made to advance both national science education as well as the purposes of science education.

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PROGRAMMES ON OFFER - 2023-24

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(A) Bachelor's Degree Programmes	Course Duration	Tuttion Fee Rs.	(D) Diploma Programmes	Course Duration	Tuition Fee Rs.
8.4 - Bachetor of Arts (English, Telugu & Urdu Medium)	3 years	2,700/-lst Yr	Diploma in Marketing Management (English Medium)	1 year	8,0001-
B.Com - Bachelor of Commerce (Telugu & English Medium)	3 years	2,500/- Ilind Yr	Diploma in Financial Management (English Medium)	1 year	S,000/-
B.Sc. Bachelor of Science (English, Telegu & Urdu Medium) (Lab. Fee Rs. 1600): for each Science & Psycholoov Subjects)	3 years	2,500/- Illind Yr	Diploma in Human Resource Management (English Medium)	1 year	8,0001-
(B) Mastar's Drogrammas	Course	Tuttion Fee	Diploma in Operations Management (English Medium)	1 year	8,000/-
	Duration	Ris Constant	Diploma in Business Finance (English Medium)	1 year	5,2001-
M.A. English, M.A. Hindi, M.A. Telugu, M.A. Urdu,	2 years	5,000/-2 year	Diploma in Writing for Mass Media in Teluou	f vear	< 2001.
W.A. Economics, History, Political Science, Public Administration, Sociology - (Telugu Medium)	2 years	5,300/-1 year 5,000/-2 year	Diploma in Environmental Studies (Telugu Medium)	1 year	5,2001-
M.A. Journalism and Mass Communication (English Medium)	2 years	7,800/-1 year 7,500/-2 year	Diploma in Human Rights (English Medium)	1 year	4,0001-
W.Sc. Mathematics & Applied Mathematics (English Medium)	2 years	7,800(-1 year 7,500(-2 year	Diploma in Women's Studies (English Medium)	1 year	4,0001-
V.Sc. Botany, W.Sc. Environmental Science (English Medium)	2 years	15,300/-1 year 15,000/-2 year	Diploma in Culture & Heritage Tourism (English Medium)	1 year	5,200/-
W.Sc. Physics, W.Sc. Zoology, W.Sc. Psychology (English Medium)	2 years	15,300/-1 year 15,000/-2 year	(E) Certificate Programmes	Course Duration	Tuition Fee Rs.
W.Sc. Chemistry (English Medium)	2 years	18,300/-1 year 18,000/-2 year	Certificate Programme in Food and Nutrition (Telugu Medium)	6 months	1600/-
M.Com. (English Medium)	2 years	7,8001-1 year 7,5001-2 year	Certificate Programme in Literacy & Community Development (Telugu Medium)	6 months	21001-
(C) Professional Programmes (Post Bachelor's Level)	Course Duration	Tuition Fee Rs.	Certificate Programme in NGO's Management (Telugu Modium)	6 months	21001-
M.B.A Master's Degree in Business Administration (English Medium)	2 years	15,300/-1 year 15,000/-2 year	Certificate Programme in Early Childhood Care & Education (English Medium)	1 year	5,4001-
M.B.A (Hospital and Health Care Management) with AHERF, KIMS & DET (English Medium)	2 years	1,20,000!-	(F) Research Programmes (Ph.D in)	Course Duration	Tuition Fee Rs.
Master's Degree in Library & Information Science (MLISc) (English Medium)	1 year	-1005,011	English, Hindi, Education, Economics, History, Political Science, Public Administration,		15,000/-1year
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Bachelor's of Education (B.Ed - ODL) (Telugu Medium)	2 years	40,000/-			
Bachelor's of Education (B.Ed. Special Education - 00L) (English & Telugu Medium)	2 % years	40,0001-	BRAOU CALL CENTRE NO : 1800	5990	5

