

WELCOME TO NAAC PEER TEAM





Vision and Values:

- Aligned with University Motto
- Embracing"ThejasvinaVadhitamastu"

Department's Focus:

- High Teaching and Research Standards
- Attitude and Skill Development
- Community Support
- Student Leadership and Responsibility

Aspiration for Biotechnology:

- Cornerstone of Progress
- Inspiring Hope
- Improving Lives
- Eco-Friendly Solutions for the Planet

Mission





Review and enhance the existing biotech curriculum to align it with the latest industry trends and research needs.

Promotion of quality of biotechnology teaching, learning and research

To promote the use of state-of-the-art technology and quest for excellence

Specific technologies to be adopted, associated budgets, and a timeline for implementation.

Partnerships with industry and government organizations to support biotech research.

To undertake biotech research and training programmes

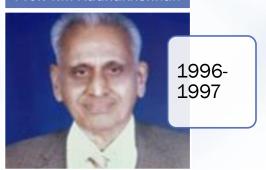
To foster global competencies of biotech students:

Establish partnerships with other institutions and biotech industries to facilitate student research and internship programmes.

Founders and Current Leadership







Prof. T. Ramana



Prof. V Lakshmi



From 2023 onwards

Prof. T.M Radhakrishnan:

• The Department of Biotechnology was established in the year 1996 by Late Prof. T.M Radhakrishnan former Principal AUCST. Prof T.M. Radhakrishnan awarded as Best Teacher (1991-92), Government of Andhra Pradesh.

Prof. T. Ramana:

- He nurtured the Department several years as Head of the Department.
- It offers a Two-year M.Sc., Biotechnology Program in the year 1996.
- It also offers Ph.D. in Biotechnology.
- Prof. T. Ramana organized 12 refresher courses under Multi centric project Andhra Pradesh Netherlands Biotechnology Programme (APNLBP) collaboration with the Government of the Netherlands between 2005 – and 2010.

Prof. B V Sandeep:

• Member, State Level Expert Appraisal Committee, Andhra Pradesh (SEAC) 2014-2017 & Vice Chairman SEAC - 2017-21.

Dr. V Lakshmi

• Head of the Department from 2023 till date.





| Name | Qualification | Designation | Specialization |
|----------------------------|---------------|-----------------------------|--|
| Dr. V Lakshmi | Ph.D. | Head & Associate Professor | Genetics |
| Prof. Sadhya Deepika | Ph.D. | Chairperson-BOS & Professor | Mycology |
| Prof. P.S.P. Dhanunjay | Ph.D. | Chair Professor | Medical Molecular Diagnostics and Immunology |
| Prof. Ravi Kiran S. Yedidi | Ph.D. | Professor of Practice | Medical & Pharmaceutical Biotechnology |
| Prof. Kiruthiga PV | Ph.D. | Professor of Practice | Toxicology and pharmacology |
| Dr.Pola Sudhakar | Ph.D. | Assistant Professor | Plant Tissue Culture |
| Dr.P Bindiya | Ph.D. | Assistant Professor | Algal Biotechnology |



Curriculum Aspects



Programmes Offered

| Programme | Year of Inception | Intake |
|--------------------|-------------------|--------|
| M.Sc Biotechnology | 1996 | 30 |
| Ph.D Biotechnology | 2002 | |





National education policy (NEP)



Outcome-based education (OBE) framework



Continuous teaching and learning approaches.

Planning course outcomes

Educational objectives

Assessment tools

Quality improvements





1st Semester

- BT 1.1- Cell biology
 & Evolution
- BT 1.2 Biomolecules
- BT 1.3 MIcrobial physiology & Genetics
- BT 1.4 Analytical tools and techniques in biotechnology

2nd Semester

- BT 2.1 -Enzymology and metabolism
- BT 2.2 Molecular biology
- BT 2.3 Genetic engineering
- BT 2.4 Biology of immune system

3rd Semester

- BT 3.1 Cell culture technology & Tissue engineering
- BT 3.2 Plant Biotechnology
- BT 3.3 Animal Biotechnology
- BT 3.4 Medical & Environmental Biotechnology

4th Semester

- BT 4.1 Heterologous expression and Down stream processing
- BT 4.2
 Bioinformatics and Biostatistics
- BT 4.4 Research Projects with internship

Seminar



- oIn each of the semesters each candidate has to present a paper on Biotechnology and related topics, according to the schedule given by the Department for 30 Minutes in the SEMINAR conducted by the Department.
- oIn the fourth Semester the student has to complete a project work period of two months
- There is a continuous internal evaluation for 30 marks for each course paper





PO1: Students acquire insides into subjects like microbiology, molecular biology, genetic engineering

PO2: Well versed with biotechnological remedies for human health and environmental problems

PO3: Trained in basic and advanced areas in biotechnology to develop biotechnological processes and productions

PO4: Multidisciplinery proficiency will be attained by utilizing MOOC's courses

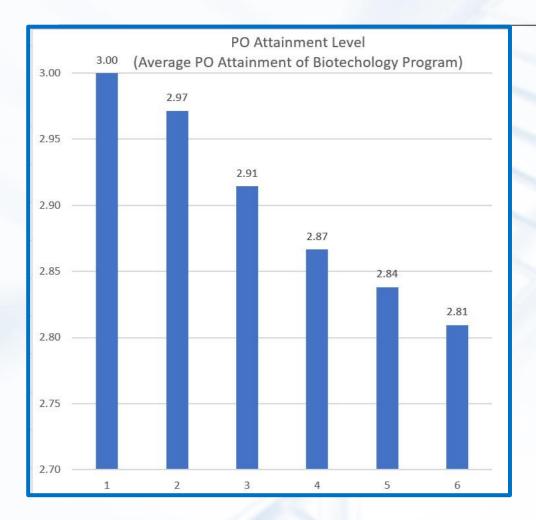
PO5: Awareness will be created regarding intellectual property rights (IPR)

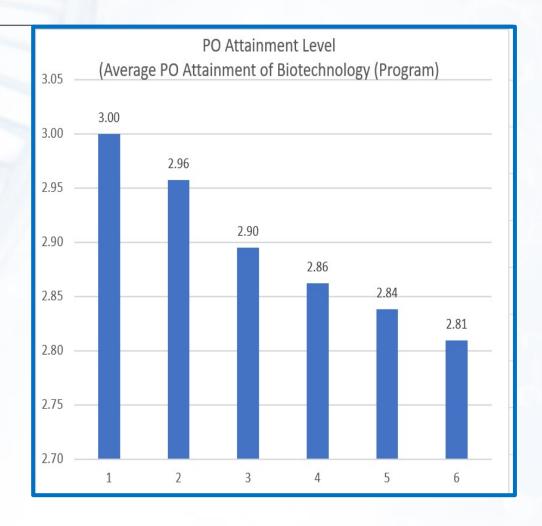
PO6: Development of human capital for advanced scientific research and entrepreneurship

PO Attainment for Batch 2020-2022

PO Attainment for Batch 2021-2023











MOOCs from online platform SWAYAM, Coursera in 3rd and 4th semester

(Google Link to be provided here)

https://play.google.com/store/search?q=swayam &c=apps&hl=en-IN The Science of Stem Cells

Drug Discovery

Data Science

Systems Biology

Solid Waste Management

Biomedical Nanotechnology

Biostatistics

Courses with Employability/Skill Development/ Value Added Courses



Molecular Biology and Genetic Engineering - R & D, Technicians

Enzymology and Immunology - Diagnostic Labs

Plant Tissue Culture - Floriculture & Horticulture

Industrial Biotechnology & Bioinformatics - Pharmaceutical & Biotech Industry

Value-added courses such as Intellectual Property Rights (IPR) and Research Methodology are included in the student curriculum.





The following approaches aim to address the diverse needs of learners and promote a positive and nurturing educational experience.

| 4.8 | Peer-assisted Teaching |
|-----|--------------------------------------|
| | Informal Interactions and Mentorship |
| | Resource Distribution |
| | Regular Monitoring |
| | Remedial Classes |

Assistance and Encouragement for Fast Learners



The following approaches aim to encourage the fast learners and promote a positive and nurturing educational experience.











Participate in National/State Exams – CSIR NET/GATE/Civil Services/Judicia I Services Encourage them to Publish papers in Journals & file patents of their works Online Learning Programs, Workshops and Research Projects. Platform for Fellowships @ Abroad Universities for Higher Studies and Research To Incubate the ideas @ incubation centers to develop as an entrepreneur

Integration of Environmental Sustainability in the Curriculum



The syllabus has been meticulously framed keeping in view of the need for environmental sustainability, waste management, Pollution control, Organic farming, and Bioremediation.

Few projects taken for the Environmental Sustainability

Various Projects concerning environmental sustainability were undertaken by the students as part of the curriculum.

Biodegradation of low-density polyethylene by Fusarium Oxysporium.

Bioremediation of organophosphorus pesticides Chlorpyrifos using maize: Exploring the effects.

Isolation and characterisation of biosurfactants producing microorganisms against heavy metal lead.

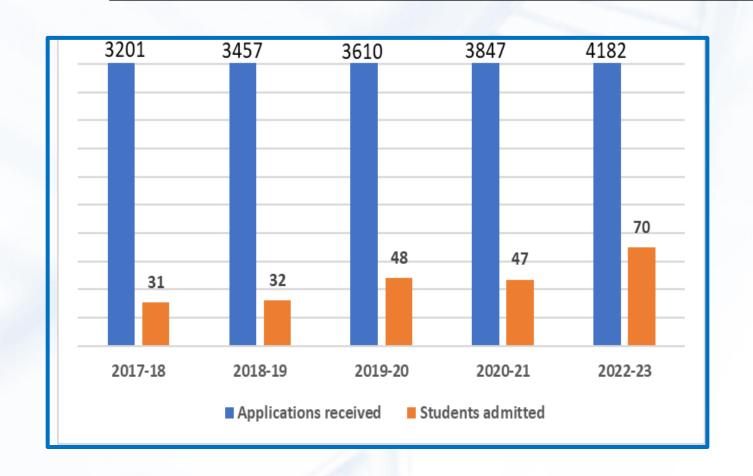
Production of biofertilizer using kitchen waste.

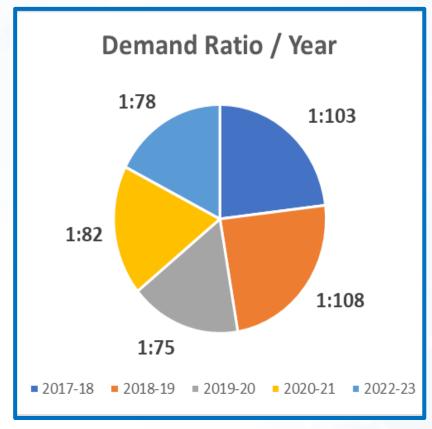


Teaching Learning and Evaluation

Demand Ratio

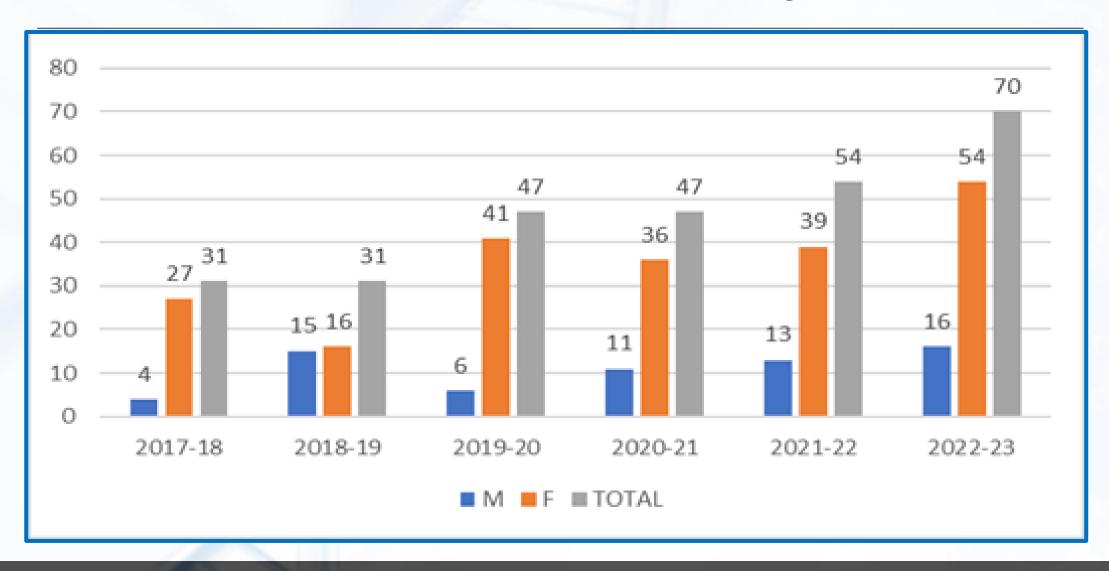






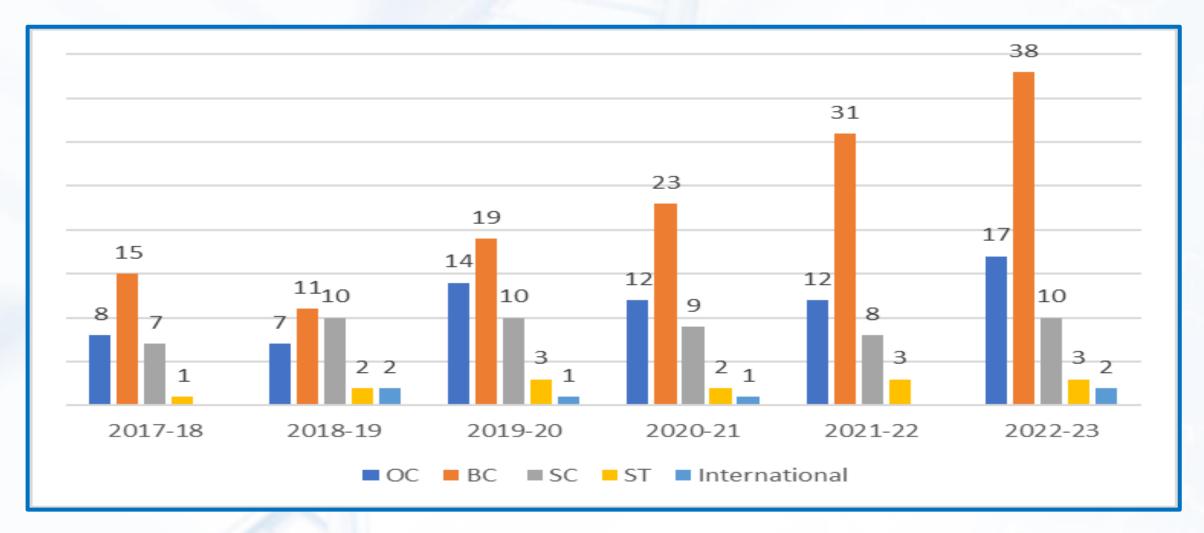


Gender Diversity





Student Diversity

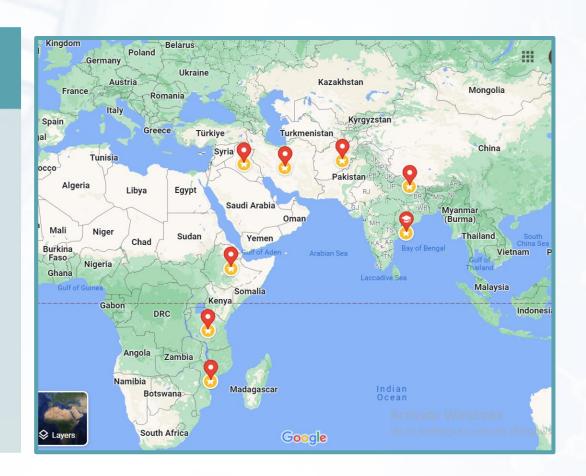




Student Diversity

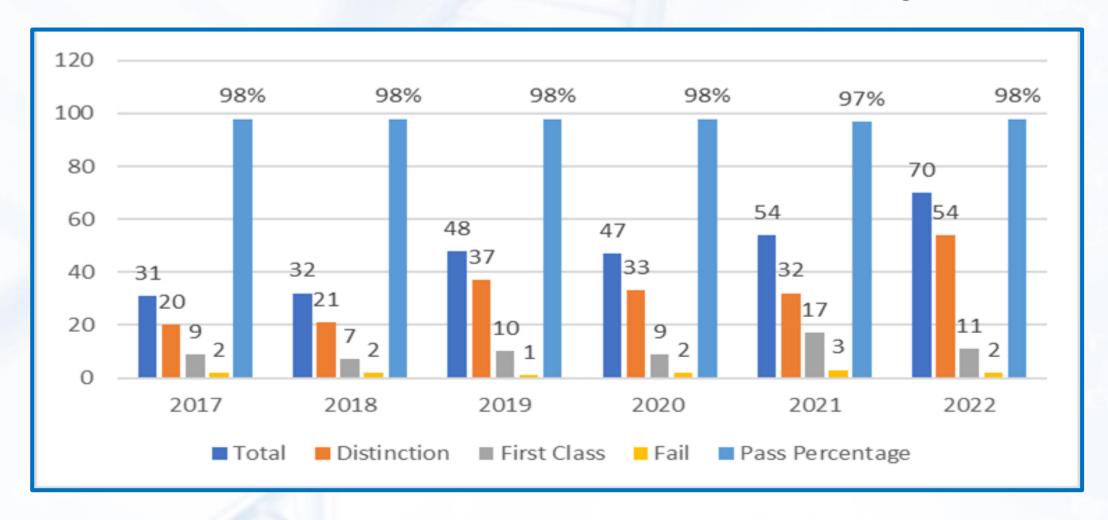
International Students

- International students from countries like Afghanistan, Bangladesh, Iran, Iraq, Ethiopia, Ghana, Mozambique, Tanzania and Nepal are some of our alumni
- 50 International students were awarded with M.Sc., degree and 2 students were awarded with Ph.D.





Student Performance Analysis





Research Innovation and Extension





- ≥ 2003-05 Human Resource Development In Biotechnology. (17.5 Lakhs)
- ≥ 2007 Training Programme in Biotechnology (0.50 Lakhs)
- ≥ 2008-2009 Refresher course in Biotechnology (14.5 Lakhs)
- ≥ 2008- 2010 Screening.... Bay of Bengal (17.5 Lakhs)
- ≥2012 -2016 Principal investigator Project financed by the European FP7 networking project PEOPLE-IRSES "Carbon balancing for nutrient control in wastewater treatment" acronym CARBALA. Coordinator: University of Florence. University of Pisa, Italy`
- ≥ 2012-2017 European FP7 networking project PEOPLE-IRSES "Clliates as Natural reservoir of potentially Pathogenic bacteria: an ecological, functional and evolutionary genomic investigation" acronym CINAR PATHOBACTER
- ≥ 2015-2019 Shallow Water Benthic Communities & Food-web Dynamics: A case for Kakinada Bay and Coastal Andhra Pradesh, Funding Agency: MoES.





| Name of the Faculty | Designation | No of Research Publications | No of Books Published | No of Conferences/ Seminars/ Workshops attended | No of Ph.D's Guided/Awarded |
|---------------------------|----------------------------|-----------------------------------|--------------------------|---|--------------------------------|
| Dr. V. Lakshmi | Associate Professor & Head | 58 | 2 | 34 | 10 PhD. 1 M.Phil |
| Prof. Sandhya Deepika | Professor | 68 | - | 30 | 15 |
| Prof. PSP. Dhanunjay | Chair Professor | 16 | - | 33 | - |
| Dr Ravikiran S. Yedidi | Professor of Practice | 26 | - | 30 | - |
| Dr. PV. Kiruthiga | Professor of Practice | 18 | - | 9 | - |
| Dr. P. Bindiya | Assistant Professor | 9 | 1 | 30 | - |
| Dr. P. Sudhakar Rao | Assistant Professor | 72 | 8 | 45 | - |

Patents



← Title: Engineered and enhanced formulation for early detection of arterial plaque formation and atherosclerosis. (Diagnostics in Cardiovascular Diseases). Patent Number: 202341017482 Inventors: Mr. Manikanta Sodasani, Mr. Hemsai Yadav Palla & Dr. Ravikiran S. Yedidi. Principal Investigator: Dr. Ravikiran S. Yedidi

← Title: Native Zymo, A new technique that combines native polyacrylamide gel electrophoresis and zymography to estimate enzyme activity. (Biotech., Mol. Bio. & Biochem.). Patent Number: 202341073807. Inventors: Mr. Hemsai Yadav Palla, Mr. Manikanta Sodasani & Dr. Ravikiran S. Yedidi. Principal Investigator: Dr. Ravikiran S. Yedidi





| Year | Conference |
|------|--|
| 2014 | National Conference "FOCUS-2014" Co-Convener at Novotel Hotel. (Conducted in collaboration with Krishna IVF) |
| 2016 | National Conferences: "NCAT-2016 (Algal Technologies) FOCUS-2016" Co-Convener at Novotel Hotel (Conducted in collaboration with Krishna IVF,) |
| 2017 | AP Science congress-2017. Prof BV Sandeep, Co-Convener for Life Sciences at A.U. Visakhapatnam (Conducted by Andhra Pradesh Akademi of Sciences & Andhra University) One Day seminar & Workshop on "Nutrition Related Health Issues in Children" Convener at A.U. Visakhapatnam. (Conducted by Depts. of Biotechnology & Foods, Nutrition and Dietetics, Andhra University) |
| 2018 | The Global Innovation Forum-2018 "Redefining the cancer care continuum" Stakeholder Department of Biotechnology, Andhra University (Conducted by ELIXSYS Group) National Seminar on Environmental Health & Biotechnological Applications in Food & Pharma Industries (EHBAFPI) 27-28 October, 2018 |





A.U. signs MoU with Krishna IVF Clinic

Staff Reporter

VISAKHAPATNAM: Andhra University has entered into a memorandum of understanding with Krishna IVF Clinic on Saturday to take up collaborative research in the area of invitro fertilisation and human reproduction.

Specialisaton

Vice-Chancellor L. Venugopal Reddy said that the university would introduce and organise specialisations in embryology, human genetics, biochemistry, microbiology and clinical pharmacology. Director of the Krishna IVF Clinic G.A. Rama Raju was present.

Research activities

Coordinator of biotechnology T. Ramana, Head of the Department of Pharmacy S. Satyanarayana, Principal of AU College of Science and Technology P. Veerraju, Prof. G. Paddaih, Head of the Department of Human Genetics G. Sudhakar, explained the research activities that would be taken up with Krishna IVF Clinic.

Rector Satyanarayana, Registrar P. Vijayprakash Member of Executive Council I. Murali Krishna Rao and others were present on the coccasion.

AU pact with IVF Clinic

Visakhapatnam, Nov 24: In order to facilitate collaborative research on 'In Vitro Fertilisation' (IVF) and human reproduction, Andhra University inked a pact with Krishna IVF Clinic here today. AU Registrar P Vijaya Prakash and Krishna IVG Clinic director GA Ramaraju signed the pact in the presence of Vice-Chancellor L Venugopal Reddy.

Reddy said the University is planning to introduce specialisations in embryology and andrology at postgraduate level besides research programmes in biotechnology, pharmacy, genetics, biochemistry and microbiology with special thrust on

clinical pharmacology. The pact facilitates scholars and students of pharmacy, biotechnology, human genetics and biochemistry to undergo practical training at Krishna IVF Clinic.

Confab on Maths

University Andhra Mathematics Department will host a three-day national conference on 'Recent Developments in Mathematics and Applications' (NCRDMA) on Nov 26 to mark its platinum jubilee celebrations. North Orissa University Vice-Chancellor S Nanda will inaugurate the confab, according to NCRDMA director Shaik Ismail. . ENS

MOU's



'Advances in Reproductive Technology Need of the Hour'

Express News Service

Visakhapatnam: More clinical research studies should be conducted in the area of assisted reproductive technologies to help the sustenance of future generations, said GSN Raju, vicechancellor of Andhra Uni-

He observed that there has been tremendous technological progress in assisted reproductive technologies in developed countries and emphasised the need to bring those services closer to people in India.

Inaugurating FOCUS 2014, the fourth conference on Academic and Clinical

Oriented Infertility Workup nology, said that a series of jointly organised by Krishna IVF Clinic and AU Department of Biotechnology here Sunday, Raju said that the Andhra University would collaborate with Krishna IVF Clinic on joint research projects in the fields of infertility and assisted reproductive technologies.

He said that the AU has the Centre for Biomedical Engineering, Biotechnology, Microbiology, Pharmaceutical Sciences and other life sciences, which would collaborate in pursuing studies on assisted reproductive technologies.

BV Sandeep, head of the AU department of biotech-

workshops would be conducted on biotechnology and human genetic and assisted reproductive technologies regularly at the department of biotechnology in collaboration with the doctors from Krishna IVF Clinic.

GA Rama Raju, director of Krishna IVF Clinic, explained the objectives of FOCUS conferences being organised every year for the benefit of medical practitioners to get an insight into the current evidence and advances in assisted reproductive technologies. Prominent doctors and medical experts participated in the scientific sessions and discussions.

Call for more research in assisted reproductive tech

OUR BUREAU

Visakhapatnam: Andhra University Vice-Chancellor Prof. GSN Raju on Sunday emphasised the need for more clinical researches in the area of assisted reproductive technologies to help the sustenance of future generations.

He inaugurated the 4th Conference on Academic and Clinical Oriented Infertility Workup, 'FOCUS-2014',

organised by the Krishna IVF Clinic and the Department of Biotechnology, Andhra University, here.

Addressing the gathering, he said: "Andhra University has a Centre for Biomedical Engineering, Biotechnology, Microbiology, Pharmaceutical Sciences and other life sciences, which would collaborate in pursuing studies on assisted reproductive technologies."

Prof. Raju complimented Dr GA Rama Raju of Krishna IVF Clinic for

providing world-class technologies in the country. Doctors, research scholars and faculty members would benefit through the academic and clinical-oriented infertility sessions, he added.

Head of the Department, of Biotechnology Prof. BV Sandeep said that a series of workshops would be conducted on biotechnology and human genetic and assisted reproductive technologies regularly in the Department of Biotechnology with the col-

laboration of doctors from Krishna IVF Clinic. Dr GA Rama Raju, director, Krishna IVF Clinic, explained the objectives of 'FOCUS' conferences being organised every year for the benefit of medical practitioners.

Dr G Ramakrishnam Raju, Dr CV Kannaki, Dr Kurian Joseph, Dr Mamta Deenadayal, Dr Subba Raju, Dr V Seetharama Raju, Dr KV Sridevi, Dr PV Kavitha and Dr B Kavitha Lakshmi spoke.



Endowment Lecture





Popular Lectures









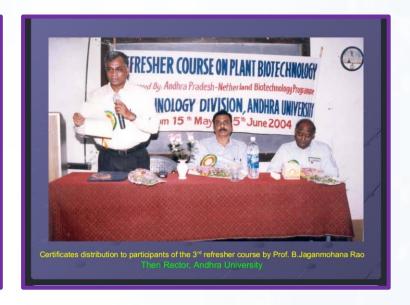
National Conference on Algal Technologies, January 4th, 2016, Visakhapatnam, Andhra Pradesh, India

Refresher Courses (APNLBP)











Learning Resources And Infrastructure Facility







Digital Class Room 1



Library



Digital Class Room 2

Infrastructures





Research Lab



Genetic Engineering Lab



Instrumentation Lab



Tissue Culture Lab

Infrastructure





Bioinformatics Lab



Store Room

Seminar Hall



Instrumentation facility







Orbital Shaker



Laminar Air Flow



Instrumentation facility







Hot Air Oven

Incubator

Centrifuge











Spectrophotometer

Oven

Autoclave





INSTRUMENTATION LAB

- 1. AKTA PRIME (AMERSHAM BIOSCIENCES)
- 2. PCR (EPPENDORF MASTERCYCLES PERSONAL)
- 3. VACCUM PUMP (MILLIPORE)
- 4. MICROPLATE READER (BIOMART IMARK^{TM)})
- 5. MICROSCOPE (LABOMED^R CL)
- 6. BIOFERMENTOR (IKA^R RV10 DIGITAL SPECTROCHEM INSTRUMENTS PVT.LTD)
- 8. TRANSILLUMINATOR (BIO VIEW) UV LIGHT
- 9. SCANNING UV-VISIBLE SPECTROPHOTOMETER (CHEMITA 2100)
- 10. LYOPHILIZER (CONJUL CONSOLIDATED PVT.LTD.)





M.Sc LABORATORY

1. REFRIGIRATOR (WHIRLPOOL)

- 2.HOT AIR OVEN (ANTIQUE)
- 3.HOMOGENIZER (REMI MOTORS)
- 4. INCUBATOR (ADAIR DUTT AND CO)
- 5. INCUBATOR (KEMI)
- 6. CENTRIFUGE (REMI)
- 7. WATER BATH
- 8. HEATING MANTLE (KEMI)
- 9. WATER BATH (KEMI)
- 10. MICRO CENTRIFUGE (REMI)
- 11. WEIGHING BALANCE (APOLLO)
- 12. COLORIMETER (3) (ELICO LIMT.)
- 13. PHOTOELECTRIC COLORIMETER (2) (SYSTRONICS)
- 14. PH METRE (ELICO.LIMT)





GENETIC ENGINEERING LAB

- 1. MICROSCOPE MONOCULAR (OLYMPUS CX21I)
- 2. MICROWAVE (INTELLOWAVE (LG))
- 3. HEATING BLOCK (GENEI)
- 4. LIGATION BATH (GENEI)
- 5. MINI SPECTROPHOTOMETER (ELICO)
- 6. HOT AIR OVEN (KEMI)
- 7. U.V. TRANSILLUMINATOR (BIOTECH R AND D LABORATORIES)
- 8. CENTRIFUGES (REMI)
- 9. TISSUE HOMOGENIZER (REMI MOTORS)
- 10. CHROMOTOGRAPHY CHAMBER
- 11. AGAROSE GEL ELECTROPHORESIS (BIOTECH R AND D LABORATORIES)
- 12. SDS PAGE (BIOTECH)
- 13. WESTERN BLOT (BALAJI SCIENTIFIC SERVICES)
- 14. ROTA EVAPORATOR (BIOTECH)













| Category | Bio-Hazard Waste | | |
|----------|---|--|--|
| A | Human anatomical waste, animal carcasses, microbiological waste, blood and blood products, body fluids and tissues | | |
| В | Sharps, contaminated disposable medical devices and supplies, waste generated during the care of animals infected with a human or animal pathogen | | |
| С | Waste contaminated with radioactive materials, waste contaminated with hazardous chemicals, waste contaminated with mixed hazards | | |
| D | Other non-sharp biohazard waste | | |

Bio-Medical Waste Management Rules, 2016 (Government of India, Ministry of Environment, Forests and Climate Change)



Biowaste Management Policy



- Department of Biotechnology, Andhra University, We compliance with local regulations (Maridi Eco Industries (Andhra) Pvt. Ltd, Visakhapatnam
- Prudent waste management is indispensable for both ecological sustainability and departmental safety



Student Support and Progression



Mentor-Mentee system



Mentor-mentee system

- Instrumental in fostering the academic and personal growth of students.
- It promotes peer learning, identifies student competencies, and encourages participation in challenging programs,
- also providing individualized attention.

Mentor/Mentee Ratio

- Overall university :- 18:1 (1 mentor for every 18 students)
- Biotechnology :- 23:1 (1 mentor for every 23 students)

Student feedback on Curriculum

• (https://drive.google.com/file/d/1HpaE8Bx2uaZAKpqYzVFJzG mhhgLJTLTw/view?usp=sharing)





| Name of the Mentor | Name of Students | Remarks | |
|------------------------|------------------------------|--|--|
| Dr. Pola Sudhakara Rao | Nikhila N | Over all Report: Conducted group counselling sessions to discuss personal problems and explore avenues for enhancing their personality development. During the session, the student expressed several concerns and challenges that they are currently facing, which primarily revolve around interpersonal relationships, anxiety, and self-esteem issues. To address these issues and foster personal growth, I recommended the practice of meditation and yoga, along with specific guidance on addressing the student's unique problems. | |
| | Olive Crosby. V | | |
| | P N D Aparna B | | |
| | Penkey Selshi | | |
| | Praneetha Mula | | |
| | Prasanthi V | | |
| | Prathima Vennela D | | |
| | Pravallika P | | |
| | Priya Dharshini | | |
| | Raashmi Vinaya Lalitha CH | | |
| | Ramya Dantu | | |
| | Ruchitha. K | | |
| | Rupa Sri Sai Manasa.A | | |
| | Sai Dheeraj V | | |
| | Sai Tarun Kancharana | | |
| | Shabina | | |
| | Shanmukhi P | | |
| | Shashipriya J | | |
| | Someshekar B | | |
| | Srujitha J | | |
| | Subhash Salagala | | |
| | Swarna Varshini K | | |
| | Swetha V | 1 | |
| | Sydeswarao. K | 1 | |
| | Tabitha Abhinaya. L | 1 | |
| | Tarun Kumar K | 7 | |

Sudhelayoda
Dr. Pola Sudhakara Rao

Department of Biotechnology AU

Industrial and Field Visits



- ✓ Rajkamal shrimp hatchery
- ✓ Industrial trip to Andhra medtech zone (AMTZ)
- ✓ Biodiversity Park, Vizag
- ✓ Steel Plant , Vizag
- ✓ Divis Labs, Vizag
- ✓ APPCB, Vizag









A Few Placements List



Oriental





















Selected list of Prominent Alumni



| Dr. Chelikani Prashen Professor in Canada | University Manitoba | Dr. Bapi RajuKurada Senior Scientist in USA | UIC UNIVERSITY OF ILLINOIS CHICAGO |
|--|--------------------------|--|--|
| Dr .Galam Lakshmi, Faculty in USA | Joy McCann Foundation | Prof. Sujatha P. Principal, College of Science Dr.B.R. Ambedkar University . | WHIVE AS TO A STATE OF THE STAT |
| Dr.Deepthi Kanuparthi, Scientist, Boston University,USA | BOSTON UNIVERSITY | Dr. M.S.N. Patrudu, Director, Global Clinical Studies, RAI | RA Reynolds American |
| Dr. B. Sasi Sekhar, Staff Scientist at National Institutes of Health Washington D.C. USA | OK HEALTH | Dr.Srinivas Parimi, Assistant Registrar ASPEN MEDICAL COLLEGE Australia | ASPEN |



Institutional Values and Best Practices



Best practices

Development: Regularly review and update the curriculum Encouragement:
Pursuing
Research
Projects

Experiential
Learning:
Arrange Field
Trips

Community
Engagement:
Outreach
Activities
(Swachh
Bharath)

Outreaching Activities





Beach Cleaning Activity



Science Day Celebrations



Teachers Day Celebrations



Gandhi Jayanthi Celebrations





Industrial Collaboration:

Partner with industry and research organizations for internships, placements, and research opportunities.

Foster connections with biotech, life science, pharmaceutical, and agricultural firms.

MoUs for Global Exchange Programs:

Establish international research exchange programs with foreign universities with MoUs.

Encourage student and faculty collaboration on a global scale.

Advanced
Instrumentation &
Certification
Courses:

Seek funding from agencies to equip the department with advanced scientific instruments.

Will Start new Advanced Certificate courses as per the latest Trends.



Thank you