

ISO 9001:2015

AICTE-CII: GOLD Category Institute

NAAC-'A' Grade Institute (CGPA: 3.21)

NIRF-2021 Rank : 197



KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, Telangana, INDIA.

కాకతీయ ప్రేఘోగికీ ంవ్ విజ్ఞాన సంస్థాన, వరంగల - 506 015 తెలంగానా, భారత

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - 506 015 తెలంగాణ, భారతదేశం

(An Autonomous Institute under Kakatiya University, Warangal)

(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)

website: www.kitsw.ac.in

E-mail: principal@kitsw.ac.in

☎ : +91 9392055211, +91 7382564888

Department of Physical Sciences

Dept. of Physical Sciences:

Vision:

To make the students understand the basic principles and concepts of Physics & Chemistry thoroughly which are essential for a successful engineer with environmental awareness

Mission:

To motivate and train the students acquire required knowledge for engineering applications by giving necessary inputs in theoretical and practical skills of Physical Sciences.

Dept. of Physical Sciences:

B.Tech – 1st Year Common Courses:

- 1. Engineering Chemistry- U18CH103/203**
- 2. Engineering Physics- U18PH103/203**
- 3. Environmental Studies- U18CH109/209**
- 4. Engineering Physics Laboratory- U18PH108/208**
- 5. Engineering Chemistry Laboratory- U18CH108/208**

Pogrames Outcomes:

- **1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

- **7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dept. of Physical Sciences:

Head of the Department: Dr. D. Prabhakara Chary, Assoc. Professor of Chemistry

Academic Coordinator: Dr. H. Ramesh Babu, Assoc. Professor of Chemistry

No. of faculty: 19

No. of faculty with PhD: 19

No. of faculty pursuing PhD: Nil

No. of technical & supporting staff: 04

Dept. of Physical Sciences:

Laboratories:

1. Engineering Chemistry Laboratory
2. Engineering Physics Laboratory

Research and Education Center

- Nanomaterials Laboratory
- Liquid Crystals Laboratory

Dept. of Physical Sciences:

Criterion 1 - Curricular Aspects

Curricula is developed and revised on regular basis, based on inputs from the following:

1. Feedback from stakeholders - to meet local requirements
2. Suggestions from academicians of reputed institutions - to meet regional & global need

Dept. of Physical Sciences:

Criterion 1 - Curricular Aspects

Curricula Summary: (for period 2018-19 to 2022-23)

No. of courses offered : 3 theory + 2 Labs

New courses introduced : 1. Minor in Physics
2. Minor in Chemistry

Dept. of Physical Sciences:

Criterion 2 - Teaching-learning and Evaluation

Teaching-Learning Process:

- **Class work as per Almanac**
- **Sharing Outcome Based Lecture Schedule (OBLS)**
- **Prior sharing of course material with outcomes - CDTs, SLTs**
- **Participative Learning through special Assignments in the form of Course Research Paper & Course Patent Paper**
- **Peer learning through Programme based Assignments**
- **Continuous internal assessment through Minor exams, Mid Semester exams, Assignments & Special Assignments**
- **Flip-classes through Tutorials followed as per tutorial matrix**
- **Course committee meetings**

Dept. of Physical Sciences:

Criterion 2 - Teaching-learning and Evaluation

For Slow learners:

- Remedial Classes, Tutorials, Class Discussion Materials, Question Bank

For Active learners:

- Course Research Papers and Course Patent papers
- Minor degree in Physics - 01 (awarded)
- Minor degree in Chemistry

Dept. of Physical Sciences:

Criterion 3 - Research, Innovations and Extension

- **Research Facilities in the Department:**

1. **Research and Education Centers**

- a) **Nanomaterials Laboratory**

- b) **Liquid Crystals Laboratory**

- **Research supervisors: 02**

Scholar's Name	Supervisor's Name	Year of Ph.D. awarded	University Name
T. Mallikarjun	Dr. D. Prabhakara Chary	2019	KL University Vijayawada, AP
U. Pawan Kumar	Dr. V.Prashanth Kumar	2022	JJT University Rajasthan
B. Chaithanya	Dr. D. Prabhakara Chary	Perusing	KL University Vijayawada, AP

- **Research grants received:**

S.No	Academic Year	Name of the Scheme	Funded by Organization	Details of Coordinator	PI Sanctioned Amount	Present status (Completed/Ongoing)
1.	DST/WOS-A/PM-115/2021 (c); Dated: 28-02-2023 03 years	“Convolutional neural network analysis of liquid crystal images for effective prediction of properties- A machine learning approach”.	DST-WOS, Govt. of India	Dr. D. Madhavi Latha Devi	38,41,400=00	Ongoing
2.	SRG/2021/00209 2; Dated: 17-01-2022 02 years	“In situ tumour vaccination with Imiquimod encapsulated biodegradable polymeric nanoparticles”.	DST-SERB, Govt. of India	Dr. M. Gopi Krishna	18,22,400=00	Ongoing

- Faculty obtained Ph.D:**

Name	qualification	Area of Specialization	Date of Highest Degree	Designation
Dr. D. Prabhakara Chary	Ph.D.	Physical & Environmental Chemistry	03.01.2002	Associate professor & Head
Dr.T. MadhukarReddy	Ph.D.	Synthetic Organic chemistry	2001	Associate professor
Dr.H.Ramesh Babu	Ph.D.	Synthetic heterocyclics	19.10.2001	Associate professor
Dr.Ch.Sateeshchandra	Ph.D.	Material Sciences	27.07.2015	Associate professor
Dr. N.Maramu	Ph.D.	Electronics	12.12.2021	Assistant professor
Dr.M.Ranadheer Kumar	Ph.D.	Synthetic Organic chemistry	16.08.2011	Assistant professor
Dr.M.Gopikrishna	Ph.D.	Bioorganic chemistry	16.10.2019	Assistant professor
Dr.K.Rajendra Prasad	Ph.D.	Material Science/ Polymer Science	14.10.2010	Assistant professor
Dr.K.Srinivas	Ph.D.	Nanomaterials, Spintronics, Metallurgy and Materials Science, Computational Physics	20.04.2012	Assistant professor

Name	qualification	Area of Specialization	Date of Highest Degree	Designation
Dr.E.Kalyan Rao	Ph.D.	Organic synthesis	01.12.2008	Assistant professor
Dr.Bunti Roy	Ph.D.	Radiation physics	07.04.2017	Assistant professor
Dr.V.Prashanth Kumar	Ph.D.	Materials Science	25.10.2008	Assistant professor
Dr.G.Sridhar	Ph.D.	Organic chemistry	11.07.2017	Assistant professor
Dr.P.Srinivasrao	Ph.D.	Bio-Physics	28.02.2009	Assistant professor
Dr. D. Praveena	Ph.D.	Heterocyclic Chemistry	26.05.2015	Assistant professor
Dr. D. Madhavi Latha	Ph.D.	Material Science	14.02.2013	Assistant professor
Dr. V.Sunil Kumar	Ph.D.	Chemistry	04.12.2020	Assistant professor
Dr. A. N. Mallika	Ph.D.	Material Science	14.01.2016	Assistant professor

--	--	--	--	--

Dept. of Physical Sciences:

Research Publications and Awards

Academic Year	No. of publications in SCI journals	No. of publications in Scopus journals	No. of books/ book chapters	No. of patents
2022-23	11	04	35	-
2021-22	11	08	03	-
2020-21	05	08	-	02
2019-20	03	04	-	03
2018-19	03	01	-	-

Avg. Citation Index: 11.389

Avg. h-index: 3.944

Dept. of Physical Sciences:

Criterion 3 - Research, Innovations and Extension

Consultancy: Water Analysis

No. of MoUs with NIT: 01

No. of Activities conducted: 03 (NSD,FDP,ED)

Dept. of Physical Sciences:

Criterion 4 - Infrastructure and Learning Resources

Physical Facilities:

No. of Classrooms: 18

No. of Laboratories: 04 (EPL, ECL, Research Labs)

Dept. of Physical Sciences:

Criterion 6 - Governance, Leadership and Management

Departmental committees

- **BoS (IBoS/EBoS)**
- **DAAC**
- **CCM**
- **RCM**
- **CRC**
- **NAAC**
- **NBA**
- **Internal Audit Committees**

Budget allocation and utilized:

Academic Year	Budget Allocation (in Lakhs)	Budget Utilized (in Lakhs)
2022-23	3.1	2.73
2021-22	3.22	1.61
2020-21	5.17	0
2019-20	5.17	1.81
2018-19	3.21	1.99

List BoS meetings conducted: date and purpose

Date	Purpose
28-10-2022	<ol style="list-style-type: none">1. To introduce lab manual cum record book (LMRB) for CIE2. Syllabus modification for the courses Engineering Physics under URR_R22 & Engineering Physics Laboratory.3. Preparation of academic plan for AY 2022-2023.4. Updation of Course web for the courses Engineering Physics & Engineering Physics Laboratory
15-12-2021	<ol style="list-style-type: none">1. Minor changes in Syllabus for the course Engineering Physics Laboratory2. Providing Assignments, CP, CRP, CDTs, OBLS, tutorial sheets for Engineering Physics course.3. Updation of Course web.
09-08-2019	<ol style="list-style-type: none">1. Preparation of academic plan for AY 2019-2020.2. Change of sequence of experiments in Engineering Physics Laboratory course.3. Preparation of Assignments and Tutorial sheets for the courses Engineering Physics.
02-06-2023	<ol style="list-style-type: none">1. Providing Previous question Papers.2. Syllabus change for the courses Engineering chemistry & Engineering chemistry Laboratory.3. Providing certificates to the students who have presented seminars on CRP, CP

SWOC ANALYSIS OF THE DEPARTMENT

Strengths:

1. **100% of existing faculty possess a doctorate degree.**
2. **The average teaching experience of the faculty is more than 14 years.**
3. **Faculty are updating their knowledge by attending continuous education programmes like FDPs, Workshops, Refresher Courses, STTPs, Certification courses of NPTEL, MOOCS.**
4. **More than 350 papers were published by the faculty in national/international journals and conferences.**
5. **Most of the faculty are involved in administrative works(NCC Officer, NSS Officer, PRO).**

Weakness:

1. **Less number of submissions for research projects.**
2. **Department Research Centre**

Opportunities:

- 1. Scope for improvement for more number of research quality publications with qualified faculty**
- 2. Scope for conducting FDPs and Workshops.**
- 3. Encouraging faculty to acquire more online certification courses like MOOCS, SWAYAM, NPTEL courses etc.**

Challenges:

- 1. Majority of admitted students are with rural background and of Telugu medium.**
- 2. Orienting students towards OBE system as the admitted students are not properly trained on skill based education at +2 level (Intermediate).**

SHORT TERM GOALS & ACTION PLAN

Short term goal	Action Plan
To minimize the detention of students because of shortage of attendance.	Motivating the students to maintain 100% attendance
To minimize the detention due to backlogs in first year subjects.	<ol style="list-style-type: none">1. By conducting more effectively the special remedial classes beyond college hours.2. Providing additional Assignments.
Analytical and experimental skills to be developed and executed in the higher semester.	Faculty Manual introduced to enhance the individual attention.

LONG TERM GOALS & ACTION PLAN

Long term goal:

To bridge the gap between industry and academia.

Action Plan:

To create awareness related to industry relevant knowledge.

Distinctiveness of the department

- **100% of existing faculty members possess doctoral degrees.**
- **The average teaching experience of the faculty is more than 13 years.**
- **Introducing basic principles and concepts of sciences to inculcate complex problem-solving skills among the students.**
- **Faculty are updating their knowledge by attending continuous education programs like FDPs, Workshops, Refresher Courses, Certification courses of NPTEL, MOOCS etc.,**
- **More than 380 papers were published by the faculty in national/international journals and conferences.**
- **One of the faculty members is involved in translating Two Swayam NPTEL Courses into Telugu.**
- **Most of the faculty are involved in administrative work. Publishing research papers in reputed journals**
- **Two DST projects were sanctioned worth of 56.16Lakhs under DST/SERB, Govt of India.**

Major achievements

S.No.	Academic Year	Faculty Name	Achievement
1	2023-24	Dr. M. Gopi Krishna	Published one book chapter entitled "Magnetic Quantum Dots for In-Vivo Imaging" in CRC PRESS
2	2022-23	Dr. K. Rajendra Prasad	Translated the files of the NPTEL course "Introductory Quantum mechanics (115104096)"
		Dr.N.Maramu	Published one book entitled "Research Methodology" by Book Rivers publishers
		Dr. D. Madhavi Latha	Sanctioned one DST(WoS) project worth of 38.41Lakhs
3	2021-22	Dr. M. Gopi Krishna	Sanctioned one DST project worth of 18.22Lakhs
		Dr. K. Rajendra Prasad	Translated the files of the NPTEL course "Introduction to Electromagnetism(115104088)"
		Dr.N.Maramu	Published one book chapter entitled "Crystal chemistry, Rietveld analysis, structural and electrical Properties of cobalt-Erbium Nano-ferrites" in Ferrites-Synthesis and Applications by Intechopen publishers
4	2020-21	Dr. N. Maramu	Published one book chapter entitled "Investigation of Structural, Magnetic and electrical Properties of Chromium substituted Nickel Ceramic Nanopowders" in Advanced Ceramic Materials by Intechopen publishers
6	2018-19	Dr. D. Prabhakara Chary	Sectional secretary for science in the service of Society at Telangana State Science Congress (TSSC-2018) organized by Telangana Academy of Science in association with NIT Warangal during 22-24 th December, 2018.

BEST PRACTICES

- **Sending attendance reports of the first-year students to their parents on daily basis through CMS**
- **All the students are motivated in the first year to wear ID cards / Proper dress.**
- **Monitoring and counseling the first-year students through class teachers.**
- **The faculty members are motivated to acquire online certificate courses.**
- **Arranging tutorials, remedial classes in the regular timetables and special remedial classes beyond college hours.**
- **Conducting SIP/UHV-I more effectively with internal resources**
- **Setting the Mid-Semester and End semester Question Papers as per Blooms Taxonomy with ToS table**

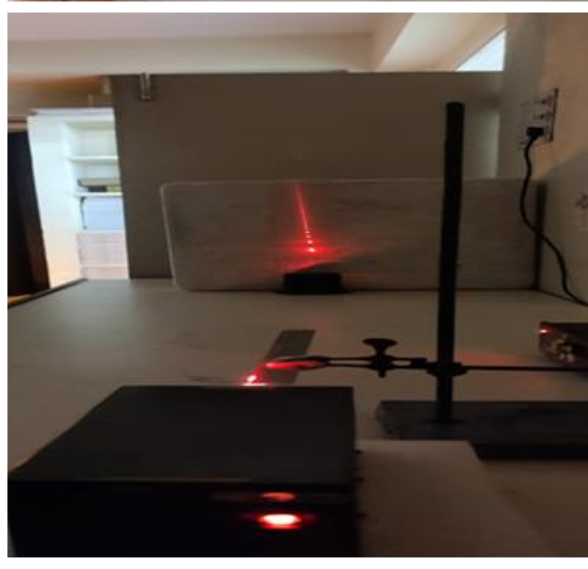
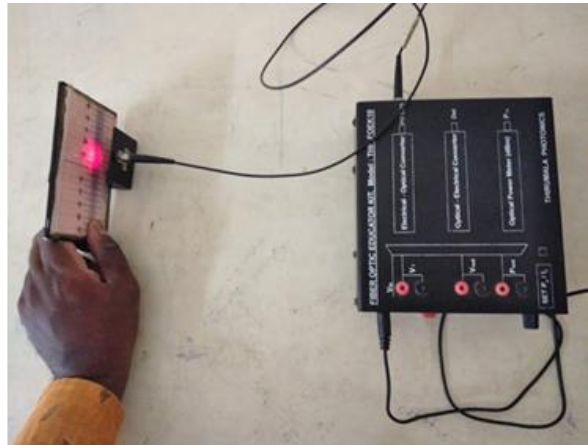
PHOTO GALLERY

ENGINEERING PHYSICS LABORATORY



ENGINEERING CHEMISTRY LABORATORY





CHEMISTRY RESEARCH LABORATORY: Implement Best Practices

Funding agency: DST-SERB, Government of India

Lab-In charge: Dr M. Gopi Krishna, Assistant Professor



Engineering Chemistry Laboratory : Water Analysis Equipment





7 90 Th 232.0381	2 7 N 14.00674	4 19 K 39.0983	5 39 Y 88.90585	2 8 O 15.9994	7 92 U 238.0289
---------------------------	-------------------------	-------------------------	--------------------------	------------------------	--------------------------

