



AICTE Training and Learning (ATAL) Academy
Sponsored
Faculty Development Programme
on

Recent Development
in
Nano-electronics Devices:
Challenges and Opportunities
(11–16, December 2023)



**Swami Keshvanand Institute of Technology,
Management & Gramothan**

(Accredited by NAAC with A++ Grade)

Approved by AICTE, Ministry of Education, Government of India

Recognized by UGC under Section 2(f) of the UGC Act, 1956

Affiliated to Rajasthan Technical University, Kota

Web: www.skit.ac.in, Email: info@skit.ac.in

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About ATAL Academy



Vision

To empower faculty to achieve goals of Higher Education such as access, equity and quality.

Mission

- To establish AICTE Training and Learning (ATAL) cell in all the technical institutions, Universities, Deemed-to-be Universities, and other institutions of technical learning.
- AICTE will support for establishment of an AICTE Training and Learning (ATAL) cell in all the technical institutions. Universities. Deemed to be Universities and other institutions of technical learning.
- AICTE HQ will have a training cell who will coordinate with training academies of AICTE and training cells across the country.
- To establish Academies web portal and mobile application for carrying out its operations.
- To build a database of trainers/experts, Video Repositories, Training materials and training needs of technical institutions.
- Training needs analysis of technical manpower of the country.

Objectives of ATAL Academy

- To set up an Academy which will plan and help in imparting quality technical education in the country
- To support technical institutions in fostering research, innovation and entrepreneurship through training
- To stress upon empowering technical teachers & technicians using Information & Communication Technology
- To utilize SWAYAM platform and other resource for the delivery of trainings.
- To provide a variety of opportunities for training and exchange of experiences.
- Such as workshops, Orientations, learning communities, peer mentoring and other faculty development programmes.
- To support policy makers for incorporating training as per requirement

About Host Institute



Swami Keshvanand Institute of Technology, Management & Gramothan (SKIT) inspired from the learnings of Swami Keshvanand, was established in the year 2000 by Technocrats and Managers Society of Advanced Learning and Gramothan. Today the institute is recognized as one of the centers of academic excellence in Northern India. The Institute is affiliated to Rajasthan Technical University, Kota for offering Postgraduate and Graduate Courses in Engineering and Management.

Located in the Pink City Jaipur, which is a blend of traditional history and modern outlook, SKIT is putting in efforts for making industry ready engineers and managers through effective Industry –Institute Interface. The green landscaping, aesthetic elegance of arches and the vibrant pursuit of knowledge by the young aspirants make the environment serene, pleasant and dynamic.

Vision of Institute: To promote higher learning in advanced technology, management skills and industrial research to make our country a global player

Mission of Institute: To promote quality education, training and research in the field of engineering & management by establishing effective interface with industry and to encourage faculty to undertake industry sponsored projects for students

Quality Policy of Institute: We are committed to ‘achievement of quality’ as an integral part of our institutional policy by continuous self-evaluation and striving to improve ourselves.

Institute would pursue quality in

- All its endeavours like admissions, teaching- learning processes, examinations, extra and co-curricular activities, industry institution interaction, research & development, continuing education, and consultancy.
- Functional areas like teaching departments, Training & Placement Cell, library, administrative office, accounts office, hostels, canteen, security services, transport, maintenance section and all other services.

NAAC

Only Affiliated
Technical Institute of
Rajasthan with
‘A++’ Grade
(valid till 30.05.2027)

NBA

Most of UG
Engineering
Programmes
Accredited & re-
accredited by NBA
since 2009

**RTU
Ranking**

Ranked No. 1
Engineering Institute
in Rajasthan by
Rajasthan Technical
University, Kota for
6th year in a row.

About Programme and Objectives

Title of FDP: Recent Development in Nano-electronics Devices: Challenges and Opportunities

Date: 11–16, December 2023

Mode: Offline

This FDP gives an opportunity for participants to get acquainted of recent advances in nanoelectronics devices and their applications in different domain. Nanoelectronics is one of the increasingly important multidisciplinary areas from engineering applications to designing medical devices and nano sensors, memory devices, solar cells etc. and from manipulating the atomic molecules to manufacturing.

This FDP is aimed to provide an insight to understand and utilize the unique properties and interaction of matter, and thus their physics and chemistry for the design, analysis, and operation of state-of-the art next generation electronic devices.

The main aim of this faculty development program is to understand the recent advances, trends and challenges in the field of Nanoelectronics. It will also provide hands-on demonstration of modeling and simulation of recent advances nanoelectronics devices.

Programme Objectives

1. To provide exposure to Nanoelectronics -Techniques to enhance the teaching and research skills:
2. To develop a logical understanding and comprehensive view of the applications of various new materials and semiconductor devices.
3. To solve industry problems using practical approaches including conventional to latest applications.

About Programme and Objectives

Session and pedagogy planning

Duration- Six days (Monday to Saturday)

25 hours of teaching in ten equal sessions.

5 hours of practical/labs/ experiential learning sessions of one hour each.

4 hours of article discussion of one hour each.

3 hours, each for MCQs, reflective journal and feedback.

3.5 hours for Industrial visit

Continuous Comprehensive Assessment of Candidates shall be carried out and certificate would be issued up on achieving at least 70% to receive over all in following aspects in the weightage mentioned below.

- **Attendance** – minimum 80% attendance - (individual)- weightage 20%
- **One assessment** – combination of MCQs/short answer type/reasoning based, etc. - (Individual) - weightage10%
- **2 Page Article Summary/ per Team** – (Team & Individual)- - weightage 30%
- **Teaching Practice** – (Individual)-weightage15 %
- **Report/outcome of Industrial visit**– (Team) at the last session - weightage10%
- **Reflective Journal** – (Individual) - at the last session -weightage15%

About Speaker



Dr. Mahesh Kumar

Professor, Indian Institute of Technology, Jodhpur

Research Field: Micro and Nano device fabrications, Group III-V quantum structures, High-k dielectrics and graphene III-V, MEMS, MOS-HEMT Devices

Email: mkumar@iitj.ac.in

Webpage: <https://research.iitj.ac.in/researcher/mahesh-kumar>

Dr. Preetam Singh

Principal Scientist, CSIR-National Physical Laboratory, New Delhi

Research field: Growth of thin films and nanostructures of metal oxides and transition metal chalcogenides for efficient gas sensor devices

Email: singhp@nplindia.org

Webpage: <https://www.nplindia.org/wpcontent/uploads/common/preetam@nplindia.pdf>



Dr. Pooja Devi

Principal Scientist, CSIR-Central Scientific Instruments Organisation, Chandigarh.

Research field: Colorimetric and Fluorimetric Sensors, 2D materials-based SERS substrate design and Electrocatalytic and photo electrocatalytic water splitting

Email: poojaiitr@csio.res.in

Webpage: https://icsio.csio.res.in/csio.ems/emp_profile.aspx?id=997



Dr. Mukesh Kumar

Professor, Indian Institute of Technology Indore

Research Field: Nanoelectronics-Nanophotonics Convergence, Photodetectors, Bio-chemical Sensors

Email: mukesh.kr@iiti.ac.in

Webpage: http://people.iiti.ac.in/~mukesh.kr/index_files/Page589.htm



Dr. Anurag Gaur

Associate Professor, Netaji Subhas University Of Technology(NSUT), New Delhi

Research Field: Energy Conversion and Storage Devices, Functional Nanomaterials

Email: anurag.gaur@nsut.ac.in

Webpage: <http://nsut.ac.in/en/node/1360>



About Speaker



Dr. Shashi Kant Sharma

Assistant Professor, Indian Institute of Information Technology, Ranchi

Research Field: Modeling and Simulation of Semiconductor Devices, Fabrication and Characterization of Thin Film Devices, LP-VLSI Design.

Email: sksharma@iiitranchi.ac.in

Webpage: <https://sites.google.com/site/shashikantiit/>

Dr. Amit Mahesh Joshi

Assistant Professor, Malaviya National Institute of Technology, Jaipur

Research Field: VLSI Signal Processing architectures, Real Time Systems, Machine learning applications to VLSI Design, Biomedical Signal Processing.

Email: amjoshi.ece@mnit.ac.in

Webpage: https://mnit.ac.in/dept_ece/profile?fid=RKSI



Dr. Somesh Kumar

Assistant Professor, IIITM, Gwalior

Research Field: Modeling and Fabrication of High-Speed Interconnects, Nanoscale Device Modelling and Simulation, Flexible Devices, Biosensors

Email: somesh@iiitm.ac.in

Webpage: <https://www.iiitm.ac.in/index.php/en/departments/department-of-electrical-electronics>



Mr. Anup Kumar

Physical Design Engineer, eInfochips, Gandhinagar

Expertise: TCL · Place & Route · Static Timing Analysis · Design Rule Checking (DRC) · Physical Design

Email: anup.kumar@infochip.com



Event Schedule

Time	Day-1	Day -2	Day-3	Day-4	Day-5	Day-6
8:30 – 9:00	Inauguration					
9:00 – 11:30	Session – 1: Dr. Mukesh Kumar	Session – 3: Dr. Somesh Dahia	Session – 4: Dr. Mahesh Kumar	Session – 6: Dr. Anurag Gaur	Session – 8: Dr. Pooja Devi	Session – 10: Dr. Shashikant Sharma
11:30 – 12:30	Article Discussion	Article Discussion	Article Discussion	Article Discussion	Practical Sessions / Labs	Reflection Journal
12:30 – 1:00	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:00 – 3:30	Session – 2: Dr. Preetam Singh	Industry/Research Lab Visit	Session – 5: Dr. Amit M. Joshi	Session – 7: Dr. Anurag Gaur (National Education Policy)	Session – 9: Mr. Anup Kumar	1:00 – 3:00 PM MCQ, Feedback & Interactions
3:30 – 4:30	Practical Sessions / Labs	Industry/Research Lab Visit	Practical Sessions / Labs	Practical Sessions / Labs	Practical Sessions / Labs	3:00 – 4:00 PM Valedictory Session

Title of Talk	Speaker
Magnetron Sputtered Metal Oxide Thin Films Optical Characterization and Gas Sensing Applications	Dr Preetam Singh CSIR NPL New Delhi
Chipscale Devices for Optical Communication and Interconnects	Prof. Mukesh Kumar, IIT Indore
Wearable Technologies for Smart Healthcare	Dr Amit Joshi MNIT Jaipur
MXene A New Class of materials for Energy Harvesting Application	Dr Pooja Devi CSIR CSIO Chandigarh
IoT enabled Surface Active Metal Oxide Chemiresistor Gas Sensor	Dr Mahesh Kumar IIT Jodhpur
Fundamental of Supercapacitors for Energy Storage Applications	Dr Anurag Gaur NSUT New Delhi
VLSI Interconnects and Research Opportunities	Dr Somesh Kumar IIITM Gwalior
National Education Policy A Solution of unemployment	Dr Anurag Gaur
Recent trends of Physical Design in ASIC Flow	Mr Anup Kumar, Einfochips Pvt Ltd Gandhinagar
Emerging Research Trends in Semiconductor Devices	Dr Shashikant Sharma IIIT Ranchi

List of Participants

Sr. No.	Name	Institute Name	Designation
1	Dr. Ankit Agarwal	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
2	Mr. Abhinandan Jain	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Assistant Professor
3	Mr. Neeraj Jain	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Assistant Professor
4	Dr. Jayprakash Vijay	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
5	Dr. Swati Arora	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
6	Mrs. Priyanka Sharma	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Assistant Professor
7	Dr. Rukhsat Zafar	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
8	Mr. Sudesh Garg	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Assistant Professor
9	Dr. Shubhi Jain	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
10	Mrs. Pooja Choudhary	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Assistant Professor
11	Mrs. Manju Choudhary	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
12	Mrs. Mamta Jain	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
13	Dr. Suman Sharma	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
14	Miss Kiran Rathi	Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur	Associate Professor
15	Dr. Anurag Paliwal	Geetanjali Institute of Technical Studies Udaipur	Associate Professor
16	Dr. Priyanka Jain	Arya College of Engineering and Information Technology, Jaipur	Associate Professor
17	Mr. Ramesh Kumar	Government Polytechnic College, Alwar	Lecturer
18	Dr. Maninder Singh Nehra	Government. Engineering College, Bikaner	Professor
19	Mrs. Sumi Kumari	Rajasthan Technical University, Kota	Research Scholar
20	Dr. Sandhya Gupta	Rajesh Pilot Govt. Polytechnic College, Dausa	Associate Professor

21	Mr. Vivek Bhojak	Anand International College of Engineering Jaipur	Associate Professor
22	Mrs. Meenu Pradhan	Jagannath University, Jaipur	PG Student
23	Mr. Sandeep Kumar Jain	Vivekananda Global University, Jaipur	Assistant Professor
24	Mrs. Kumari Renu	Vivekananda Global University, Jaipur	PG Student
25	Dr. Chandra Prakash Gupta	Manipal University Jaipur	Assistant Professor
26	Dr. Reema Jain	Manipal University Jaipur	Associate Professor
27	Dr. Amit Rathi	Manipal University Jaipur	Associate Professor
28	Dr. Monika Mathur	Swami Keshvanand Institute of Technology, Management & Gramothan Jaipur	Professor
29	Dr. Minal Bafna	Agrawal P G College , Jaipur	Professor
30	Miss Priya Chaudhary	Manipal University Jaiur	Ph.D Scholar
31	Mr. Sitaram Meena	Rajesh Pilot Govt Polytechnic College Dausa	Lecturer
32	Dr. Nitesh Mudgal	Poornima College of Engineering, Jaipur	Associate Professor
33	Mr. Satyendra Kumar	Rajasthan Technical University, Kota	Phd Scholar
34	Mr. Praveen Saraswat	Malaviya National Institute of Technology, Jaipur	Research Scholar
35	Mrs. Deepika Sainani	Banasthali Vidyapith	Research Scholar
36	Mr. Manish Kumar Sharma	The LNMIIT Jaipur	Research Scholar
37	Mr. Nikhil Kumar Kanwadia	Rajasthan University	PG Student
38	Dr. Gyanesh Soni	IIS Deemed To Be University	Assistant Professor
39	Dr. Lokesh Sharma	MIT Academy of Engineering , Pune	Assistant Professor
40	Mr. Uday Chandra Akuthota	Malaviya National Institute of Technology Jaipur	Research Scholar
41	Mr. Rahul Pandey	Malaviya National Institute of Technology Jaipur	Assistant Professor
42	Mr. Dinesh Verma	Global Institute of Technology	Assistant Professor
43	Mr. Surendra Singh Dua	Global Institute of Technology	Assistant Professor
44	Mrs. Sakshi Sharma	Kautilya Institute of Technology and Engineering	Assistant Professor
45	Mr. Manish Jain	Jagannath University , Jaipur	Assistant Professor

Glimpses of Programme



Visit of CSIR-CEERI Pileri
(Jaipur Centre)



Visit of Materials Research Centre,
MNIT Jaipur



Prof. Mahesh Kumar,
IIT Jodhpur



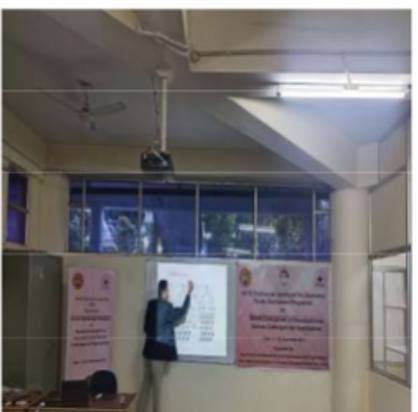
Dr. Amit Joshi
MNIT Jaipur



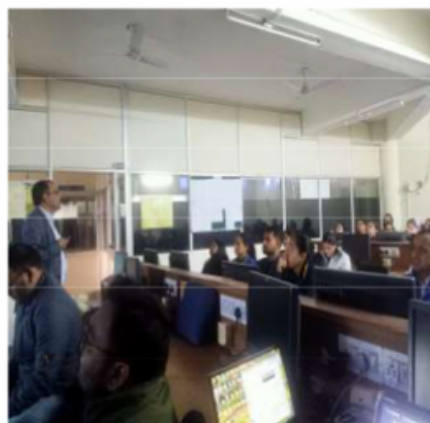
Dr. Anurag Gaur
NSUT New Delhi



Dr. Pooja Devi, Principal Scientist
CSIR-CSIO Chandigarh



Mr. Anup Kumar,
Einfochip, Gandhinagar



Dr. Shashikant Sharma
IIIT Ranchi



Dr. Umesh Chand, Institute of
Microelectronics, A STAR, Singapore

Glimpses of Programme



Lamp Lighting



Dignitaries on the Dias



Group Photograph



Prof. Mukesh Kumar, IIT Indore



Dr. Preetam Singh, Principal Scientist
CSIR-NPL, New Delhi



Dr. Somesh Dahia, IIITM, Gwalior

