Annual Report 2011-2012

Indian Institute of Technology Indore



ANNUAL REPORT
2011-2012



INDIAN INSTITUTE OF TECHNOLOGY INDORE

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INDEX

1. Director's Message 6
2. Academics 8
3. Administration 11
4. New Campus 15
5. Central Library 17
6. School of Basic Sciences 24
   a. Discipline of Chemistry 25
   b. Discipline of Mathematics 45
   c. Discipline of Physics 51

7. School of Engineering 60
   a. Discipline of Electrical Engineering 61
   b. Discipline of Mechanical Engineering 77
   c. Discipline of Computer Science 109

8. School of Humanities and Social Sciences 125
9. Student Life and Campus Activities 138


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FROM THE DIRECTOR'S DESK

I am very happy to present to you the progress and performance of IIT, Indore for the year 2011-2012.

Another eventful year, the third in the short but robust history of IIT, Indore. As a young Institute with big dreams we move cautiously but firmly and progressively towards achieving them. We have had our share of achievements, acclaim and honors and are justifiably proud of them; we have too, as in the case of any new organization, had our share of disappointments and delay but we end the year with an overall sense of progress. We are confident that we have made our choices carefully and deliberately that will ensure the long term growth of the Institute and sow the seeds for a significant role in research and pedagogy among the community of higher education Institutes in India and the world.

Let me share at the outset the progress with regard to the permanent campus for the Institute. At long last, we now have possession of the 500 acres of land at Simrol, 15 kms from Indore city and a boundary wall is being constructed alongside for security. Simultaneously, a blue print for the master plan of the institute with details for academic buildings, housing and hostel facilities, labs etc is being finalized as I write. The Board of Governors of IIT, Indore has approved execution of Phase I in three years with an estimated cost of 1400 crores. We intend to hold the first convocation of the first graduating batch of IIT, Indore on the new campus site. All of us, including Faculty, Administration and Staff are working hard to meet these proposed deadlines.

The Institute's vision includes development of innovative research facilities and opportunities. To this end, we have a continuing program of developing state of the art laboratories and classrooms with access to cutting edge research and technology.

Since the vision stated above can only be achieved with world class faculty of international repute and truly exceptional research scholars, we have doubled our efforts to recruit both. I am happy to report that our faculty strength is now nearly sixty and this academic year the number

of research scholars pursuing their PhD in various disciplines has crossed one hundred. In the coming years, the strength of the community of scholars is expected to grow. The Institute is gearing to initiate a Masters Program in selected disciplines in the near future. A two year MS program in Physics and Chemistry is slated to start in the next year as also MTech programs in various Engineering disciplines. We want to be known as a community of learners, undergraduate, Masters and PhD students along with faculty all learning from each other and contributing towards each other's successes.

Education in the 21st century is obliged to be interdisciplinary, at universities the world over, we are seeing traditional disciplinary boundaries crumbling as more and more interdisciplinary fields emerge. This is true of the Sciences, Engineering as also in the Humanities and Social Sciences. We at IIT, Indore recognize and acknowledge this paradigm shift and have charted plans for developing programs that reflect this change. We recognize that one of the advantages of being a new Institute is a happy absence of rigid models and traditional strategies that we inherit and are therefore obliged to continue. We intend to take full advantage of this opportunity to shape departments and programs that are flexible enough such that inter-disciplinarity is the norm rather than an exception. Some of the programs in the intellectual incubator at IIT, Indore include Energy Studies, Bio-Sciences, Radio Astronomy, Surface Engineering, Applied Cognition, an inter disciplinary Masters in the Humanities and so on.

The specific details of the achievements, additions and plans of each discipline and department are included in the comprehensive annual report. Let me conclude by emphasizing that we believe that our focus, our ability to adapt and adopt new research methodologies, pedagogical experiments and institutional aims will contribute to laying the foundation for a truly inspiring educational Institute whose mission is to graduate students who have the expertise, skill and sensitivity to be productive citizens.

PROF PRADEEP MATHUR

DIRECTOR, IIT INDORE

ACADEMICS OVERVIEW

IIT Indore currently has BTech programs in Computer Science, Electrical and Mechanical Engineering. The Institute also offers PhD programs in all of the above disciplines. Additionally, the Institute offers PhD programs in the Basic Science disciplines of Chemistry, Mathematics and Physics and in the Humanities and Social Sciences disciplines of Economics, English, Philosophy and Psychology. The Institute has plans to offer Masters programs in all of the above disciplines. Some of these programs are slated to begin in the next academic year.

The current student strength is 414 with 341 students in the BTech programme and 73 students pursuing a PhD in various disciplines.

Undergraduate Programme:

Category	Male	Female	Total
General	154	21	**175**
OBC	87	07	**94**
SC	42	07	**49**
ST	22	01	**23**
Total	**305**	**36**	**341**

Ph.D. Programme:

Category	Male	Female	Total
General	42	18	**60**
OBC	10	01	**11**
SC	02	00	**2**
ST	00	00	**0**
Total	**54**	**19**	**73**

The academic calendar is divided into the Autumn and Spring semester. The Autumn semester runs from the last week of July to the first week of December. The Spring semester begins in January and closes in the first week of May. As in other IIT's a system of continuous

evaluation and assessment is followed at IIT Indore with quizzes, assignments and mid semester and end semester examinations.

Two important committees with faculty representation from all the disciplines is in charge of ensuring academic excellence, accountability and fairness in the academic affairs of the Institute. Undergraduate Academic Programme Evaluation Committee (UGAPEC) and Postgraduate Academic Programme Evaluation Committee (PGAPEC) are in charge of undergraduate and post graduate programmes respectively.

Undergraduate students take a combination of core courses and electives towards their BTech from IIT Indore. Students have to earn a total of 170 credits towards their bachelor's degree. These include approximately 13.5 credits from the School of Humanities and Social Sciences. Ph.D. students typically have one year of compulsory course work to be eligible for their doctoral work. The credit weightage for doctoral students varies across the disciplines and also depends on their prior academic experience.

Faculty:

Designation	Strength
Professor	01
Associate Professor	01
Assistant Professor	38
Total	**40**

* In addition to the above the strength of visiting faculty is **23**.

ACADEMIC PROGRAMMES AND COLLABORATIONS: IIT Indore has grown manifold since its inception. Consequently, research activity at the institute has also become vigorous and led to creation of state-of-the-art teaching and research facilities and laboratories. Such facilities are benefit faulty and students from the Undergraduate to the doctoral level as they get introduced to the latest developments in the respective fields. The institute is starting two-year MSc program in Chemistry and Physics and MTech program in the Production and Industrial Engineering, Communications and Signal Processing, and Surface Engineering from the academic year 2013-14. The institute also offers French language courses to its UG and PhD students.

As a part its commitment to strengthen collaboration with acclaimed international Institutes, IIT Indore has signed MoU with Saarland University and Saarbrucken University of Germany, and Keele University, UK. The partnership allows the two Institutes to exchange students and faculty members and explore new methods of cooperation in instruction and joint research.

Administration

Administrative staff strength at Indore stands at 49 in various technical and support roles. The Institute currently has Deans for Administration and Planning (Dr. Subhendu Rakshit), Faculty Affairs (Dr P.N. Puntambekar), Academics (Dr. Neelesh. K. Jain) and Research and Development (Dr. N. S. Chaudhuri).

Additionally, there is a Board of Governors that oversees Institute policy and standards..

Members of the Board of Governors

1	Shri Ajay Piramal Chairman, Board of Governors, IIT Indore, Piramal Tower, Ganpatrao Kadam Marg, Lower Parel, Mumbai-400013	Chairman
2	Prof. Pradeep Mathur Director, IIT Indore, M-Block, IET-DAVV campus, Khandwa Road, Indore-452017	Member
3	Shri Ashok Thakur Special Secretary , Government Of India, Ministry of Human Resource Development, Department of Higher Education, Shastri Bhavan, New Delhi-110115	Member
4	Ms Ajeeta Bajpai Addl Secretary- Government of Madhya Pradesh, Department of Technical Education & Skill Development Mantralaya, Vallabh Bhawan, Bhopal-462004	Member
5	Dr Sibaji Raha Director, Bose Institute, 93/1 Acharya Prafulla Chandra Road, Kolkatta-700009	Member

6	Shri Aman Singh Secretary to Hon. Chief Minister, Government of Chhattisgarh, Energy & Information Technology, DKS Bhawan, Mantralaya, Raipur, CG-492001	Member
7	Shri K. K. Singh Chairman & Managing Director, Rolta India Ltd, Rolta Technology Park, Rolta Tower, "A", MIDC- Marol, Andheri (E), Mumbai-400093	Member
8	Shri Harpal Singh Mentor & Chairman Emeritus, Fortis Healthcare Ltd, B-10, Anand Niketan, New Delhi-110021	Member
9	Prof. Narendra Chaudhari Professor, Computer Science & Engineering, IIT Indore, M-Block, IET- DAVV Campus, Khandwa Road, Indore-452017	Member
10	Dr Neelesh Jain Associate Professor, Mechanical Engineering Department, IIT Indore, M-Block, IET- DAVV Campus, Khandwa Road, Indore-452017	Member
11	Col (Retd) G. Raja Sekhar Registrar, IIT Indore, M-Block, IET, Khandwa Road, Indore-452017	Secretary

FINANCE COMMITTEE

1	Shri Ajay Piramal Chairman, Board of Governors, IIT Indore, Piramal Tower, Ganpatrao Kadam Marg, Lower Parel, Mumbai-400013	Chairman
2	Prof. Pradeep Mathur Director, IIT Indore, M-Block, IET- DAVV Campus, Khandwa Road, Indore-452017	Member
3	Shri Ashok Thakur Special Secretary , Government Of India, Ministry of Human Resource Development, Department of Higher Education, Shastri Bhavan, New Delhi-110115	Member
4	Prof. K. K. Rao Department of Bio Science & Bio Engineering, IIT Bombay, Powai, Mumbai-400076	Member
5	Prof. N. Punekar Department of Bioengineering and Biosciences , IIT Bomaby, Powai, Mumbai-400076	Member
6	Shri A. N. Jha Joint Secretary & Financial Advisor, Government Of India, Ministry of Human Resource Development, Shastri Bhavan, New Delhi-110115	Member

7	Col(Retd) G. Raja Sekhar Registrar, IIT Indore, M-Block, IET- DAVV Campus, Khandwa Road, Indore-452017	Secretary

BUILDING AND WORKS COMMITEE

	Prof. Pradeep Mathur Director, IIT Indore, M-Block, IET, Khandwa Road, Indore-452017	Chairman
	Mr. Govind Parchani Superintending Engineer RRCAT, A-99 IDA Scheme No.103 Kesar Bagh Road Indore – 452 012	Member
	Mr. Rajeev Kumar Superintending Engineer IISER, A-234, New Minal Residency, J. K. Road, Bhopal-462001	Member
	Mr. B. Bose Management Consultant B-172, Chittaranjan New Delhi – 110 019	Member
5.	Mr. Anoop Mukund Kekere Retired Chief Engineer(Electrical) RRCAT, 143, Kalindi-Kunj, Pipalyahana, Indore – 452 001 Secretary	Member

6. Col (Retd) G.Raja Sekhar — Secretary
   Registrar
   IIT Indore, M-Block, IET-DAVV Campus
   Khandwa Road,
   Indore – 452 017

UPDATES ON THE NEW CAMPUS

OBJECTIVE

To establish a campus that will create a new Benchmark in sustainable and environment friendly building protocols in India.

VISION

The campus will be a seamless and integrated built environment that will facilitate a liberal and democratic sharing of thought. We envisage an institutional structure whose foundations will be reflective of the primary concern and pedagogical philosophy of IIT Indore, an understanding that the community here is involved in the process of teaching and sharing ideas.

CURRENT STATUS OF PROJECT

Upon approval of the establishment of an Indian Institute of Technology at Indore, the Government of Madhya Pradesh has allocated 501.62 acres of land for establishing the Institute Campus near Simrol, Tehsil - Mhow, District – Indore. 80 hectares (198 acres) of land is forest land and Stage I approval has been accorded by the Ministry of Environment & Forests, Government of India. The process of expediting Stage II approval is in progress. The lease deed has been handed over by Government of Madhya Pradesh for 432.12 acres.

PROJECT AND PROCESS

Selection of Consultant: - M/s Arcop Associates Private Limited, has been selected for the consultancy work of the Master Planning, Architectural and Engineering Services for IIT Indore.

Electricity Supply:- 132 KVA sub station is being established at Memdi village, Simrol by Madhya Pradesh Paschim Kshetra Vidhuta Vitaran Company Ltd. Electric supply will be provided to IIT Indore from this sub-station.

Water Supply: - Municipal Corporation Indore has agreed for supply of water and laying of pipeline with the condition that the cost of the laying of water pipeline will be borne by IIT Indore. The Project Manager, Indore Municipal Corporation has submitted the detailed project report for laying the water pipeline to IIT Indore Simrol campus. Narmada water will be provided at Simrol campus by tapping the Narmada water pipeline at Mhow.

Boundary Wall:- The construction of boundary wall has been initiated by M/s Ramdin Ultratech Pvt. Ltd at Simrol campus. The boundary wall will span a length of 8.5 km area and the height of 2.1 mtrs. above ground level.

Master Plan: - As approved in the DPR, 2, 21, 000 square meter of construction will be undertaken in the initial phase of campus development of IIT Indore. The Master Plan of IIT Indore was prepared by M/s Arcop Associates Private Limited giving the details of the project, campus characteristics, site analysis and concept. The Master plan was approved in the 6th Board of Governors meeting held on **30th May, 2012**. The Consultant has held series of meetings with the faculty members to finalize the requirement of space for various buildings of the Academic complex. Apart from the different buildings for disciplines and departments, the master plan for the academic complex will also include lecture halls, core laboratories, administration, health care, school and dining hall. Hostels, a Guest House and Faculty and Staff Accommodation is also part of the master plan.

CENTRAL LIBRARY





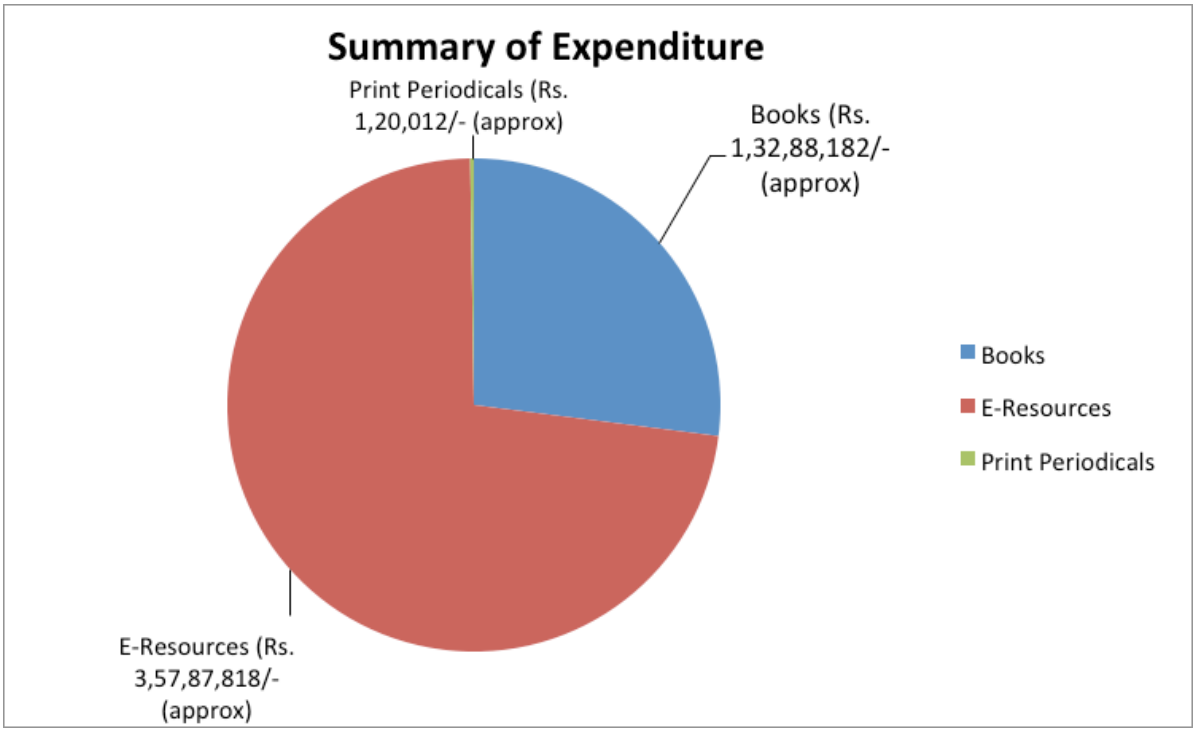


CENTRAL LIBRARY

The Central Library at IIT, Indore was initiated in 2009 and then accelerated its aim of developing a collection of print and electronic books and journals in 2010. Currently, the Library has a collection of 15800+ books with new books being added every day. These include books and journals for undergraduate students, research scholars and faculty teaching and research purposes. The Library also boasts of a select collection of fiction, literature, and general interest books and magazines for Institute members to browse and be informed and entertained.

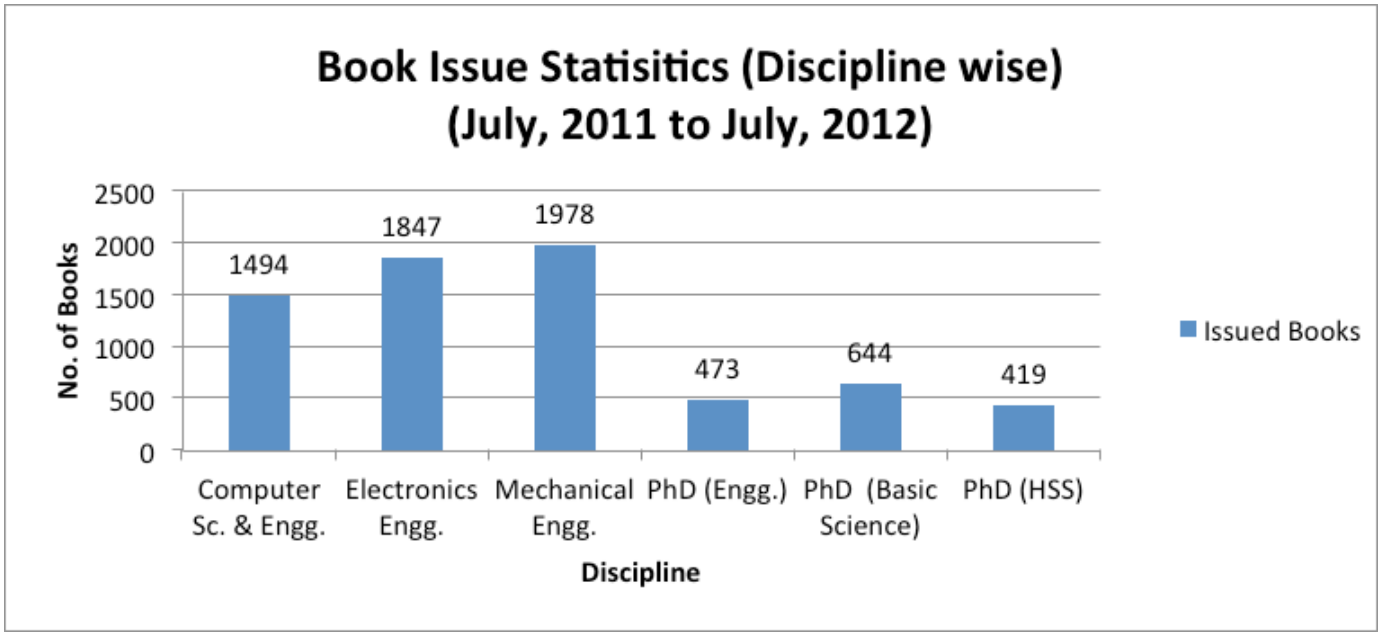
Library at a Glance:

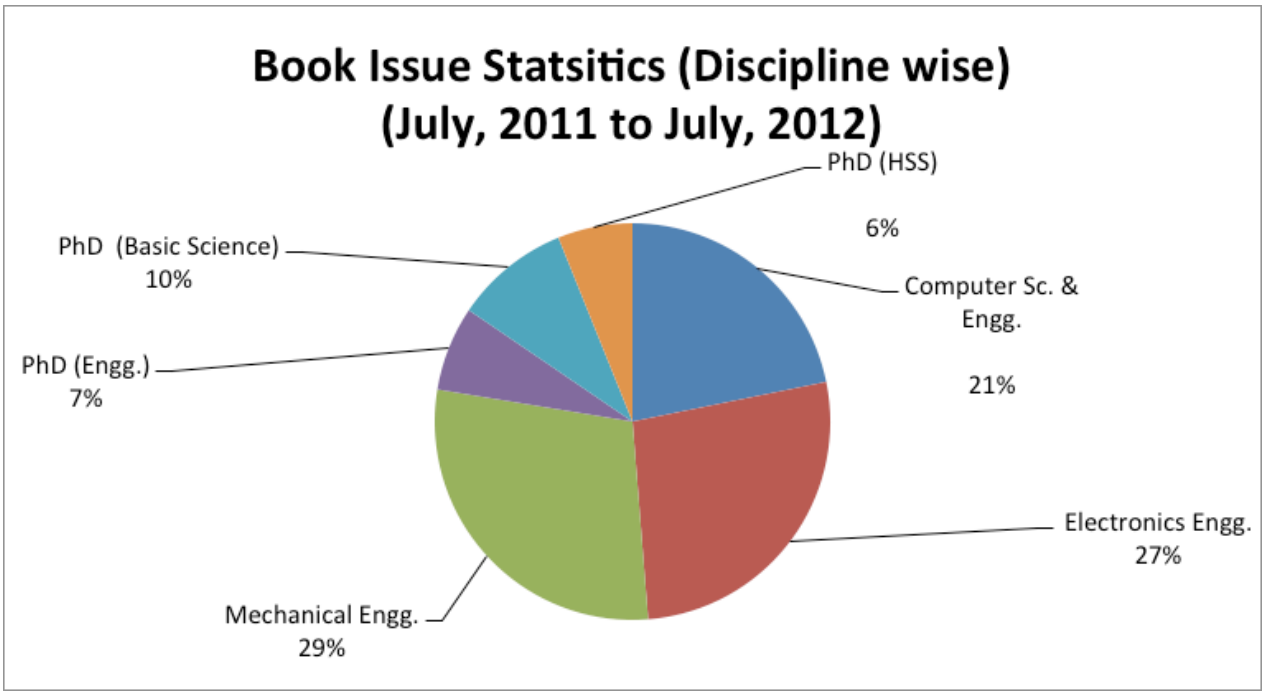
Books	E Journals	E Books	Print Journals	Magazines	Newspapers
15,800+	3774 (49 Publishers)	640	67	60	21



Usage: (**July, 2011 to July, 2012**)

Books Issued per month (Average)	Photocopies per month (Average)	Printouts per month (Average)	Reading Room Usage per month (Average)
575	7600 approx	900	2400 users p.m. approx





Periodicals and Newspapers (Print Format): The Library subscribes to 67 Print Periodicals, 60 Magazines and 21 newspapers.

Electronic Resources: Access to electronic information resources is an integral and indispensable part of an academic institution to foster learning and a global conversation with peers and partners across the world. IIT, Indore recognizes the new academic world and its virtual borders and to that end the library has developed a collection of Electronic Resources which provide access to thousands of journal articles, research papers, books, and other resources. These include ASME Journals, and IEEE XPlore Digital Library through INDEST Consortium. Access is also provided to JSTOR through INFLIBNET. Also, electronic journals published by reputed societies and publishers such as American Mathematical Society, American Chemical Society, American Institute of Physics, American Physical Society, IEEE, Wiley, have been subscribed and the access activated since January 2011. The E Resource collection also includes 640 E Books. The complete list of e-resources with hyperlinks is available on the Library web page for user friendly access.

The Services:

At present, the Library offers services as enumerated below:

- **Lending facility**: Undergraduate students can borrow 8 books for the period of 1 month, whereas Ph.D. students can borrow up to 10 books for the period of 1 month. Faculty members can borrow up to 30 books for a semester + 10 books for 15 days.
- **Overnight Lending**: Overnight lending facility is provided to students who wish to borrow a book from the reserved section, or have crossed their entitlement limit. Books on overnight issue have to be returned by 9.30 a.m. the next day.
- **Claims/ Reservations**: Users can claim/ reserve books which are issued out. Claimed/ reserved books are kept in the Library for the user for 3 days from the date of return by the previous borrower, before they can be issued to the next claimant.
- **Renewals:** Books can be renewed only if there are no claims.
- **Reading Room**: The Library provides air conditioned and wi-fi enabled Reading Room with a seating capacity of 40 students at a time. In addition to this, 5 PCs are kept in the reading room for the use of research scholars and faculty members for the purpose of accessing e-resources, checking Web OPAC, etc.
- **Inter Library Loan**: The Library has Inter Library Loan arrangements with institutes such as IIM Indore, RRCAT, etc. Under this facility, access is provided to books or electronic materials which may be needed by users but not available in our library.

- **Book Bank**: Text books are provided to SC/ST students for the period of a semester.
- **Photocopying/ Printing**: Users are provided Photocopy or Printouts of library resources subject to the provisions of the Copyright Act.

Library 2.0 Initiatives: In addition to the services mentioned above, the Library has started the following Lib 2.0 initiatives in order to overcome the space and time constraints faced by all libraries while offering more traditional services:

Library Wiki: This was started with a view to making Information available to users irrespective of time or space. Users can check the Library Rules, access the Book Recommendation Form, and check the list of books any time at:
http://centrallibraryiitindore.pbworks.com/

Library Blog: This was started as a channel of communication with users. As yet, this has been used to share information about books, and to invite users' views and comments. The student community has responded well to this channel. The blog can be accessed at:
http://centrallibraryiitindore.blogspot.com/

Twitter Account: The Library also has a Twitter Account which is being used for announcements of events such as presentations on Online resources, etc. It can be accessed at:http://twitter.com/knowledgeforall

Library Automation:
ILMS: The Library has selected an Integrated Library Management System (ILMS), Libsys7, for the automation of all its activities and services. The Circulation and other modules have been operational since the beginning of the academic year in July 2011. Users can check the Library collection by using the Web OPAC (Online Public Access Catalog).

Bar Coding: Bar Coding of books is being done at the time of processing of books. Books are issued/ returned with the help of a Bar Code Scanner at the Circulation Counter.

Other Activities: The library organizes various Training Programs/ Informative Sessions for E Resources and also for Print
Resources. In addition to this, the Library organizes a Book Exhibition annually under the name "IITI Booksville". In 2012, IITI Booksville was organized from February 8-10, 2012.

Library at PACL Campus: At PACL Campus, a library with an area of 1781 sq.ft. has been set up to cater to the teaching and research needs of Engineering Faculty members,

students, and research scholars. All the above mentioned facilities and services are provided to the users at PACL Campus Library.

People: The Library has a Library Committee which meets regularly for discussion on policy matters and decision making. The Committee Members are:

Dr. C Bharath Kumar, Convener
Dr. Manavendra Mahato, Member
Dr. Swadesh Kumar Sahoo, Member
Dr. Kazi Sabiruddin, Member
Dr. Sanjay Kumar Singh, Member
Dr. Vipul Singh, Member
Dr. Aruna Tiwari, Member
Ms. Anjali Bandiwadekar, Member Secretary
Ms. Paridhi Mishra, Student Member

The Library Team:
Ms. Anjali Bandiwadekar, Dy. Librarian (Tel. 2438713 ext. 713/ anjali@iiti.ac.in)
Mr. Rajesh Kumar, Assistant Librarian, (Tel. 6563477 ext.757 rajesh@iiti.ac.in)
Mr. Lala Ram Ahirwar, Senior Library Information Assistant (ext.757 lala@iiti.ac.in)
Mr. Gati Krushna Nayak, Senior Library Information Assistant (ext. 757 gati@iiti.ac.in)
Mr. Satish Bisen, Senior Library Information Assistant (ext. 757 satishb@iiti.ac.in)
Mr. Pallab Pradhan, Senior Library Information Assistant (ext. 757 ppradhan@iiti.ac.in)
Mr. Nitesh Singh Pawar, Senior Library Information Assistant (ext. 757 nspawar@iiti.ac.in)
Mr. Gaurav Singh, Senior Library Information Assistant (ext. 757 gsingh@iiti.ac.in)
Mr. Sunil Kapoor, Library Attendant (ext.757, sunilk@iiti.ac.in)
Mr. Ranjeet Raghuvanshi, Library Attendant (ext. 757, ranjeetr@iiti.ac.in)
Mr. Gokul Soni, Library Attendant (ext.757, gokul@iiti.ac.in)

SCHOOL OF BASIC SCIENCES



DISCIPLINE OF CHEMISTRY



FACULTY AND RESEARCH



Dr Anjan Chakraborty

Photophysics of drug molecules

Study of different biological systems

by fluorescence spectroscopy



Dr. Apurba Das

Organic Synthesis

Peptide and DNA based nanostructured materials

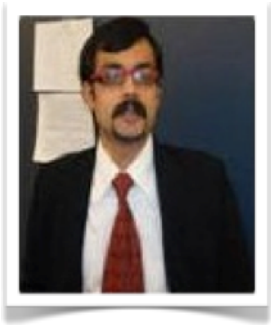
Biosensors



Dr Biswarup Pathak
Computational Material Science
Atomistic Modelling on Clean Energy Materials
Hydrogen Storage and Production
Li-ion Batteries
Fuel Cell



Dr Venkatesh Chelvam
Synthesis of biologically important natural products
Design and synthesis of heterocycles and carbocycles of biological importance
Design, synthesis and diagnostic applications of new targeting ligands for cancers
Drug delivery systems



Dr Rajneesh Misra
Organic Electronics/Photonics
Functional dyes



Dr Sampak Samanta

Asymmetric Synthesis
Metal Mediated Synthetic Transformation
Green Chemistry
Total Synthesis of biologically active compounds



Dr Sanjay Kumar Singh

Nanoparticles and Catalysts
Organomettalic and Coordination Chemistry of Transition materials



Dr Satya S Bulusu
Computational Chemistry
Structural Evolution of Nanoclusters
Global Optimization Methods
Algorithms DFT guided Simulations



Dr Suman Mukhopadhyay
Transition-Metal Coordination
Inorganic and Organometallic
Pharmaceuticals



Dr Tridib Kumar Sarma

Nanostructured Materials
Polymer Composites
Biomemetic Materials Chemistry



Dr Tushar Kanti Mukherjee

Single Molecule Flourescence Imaging
Single Molecule Spectroscopy
Developing High resolution Optical Microscope

Discipline of Chemistry

Discipline of Chemistry was initiated at IIT, Indore in July 2009. The department currently offers courses for the undergraduate BTech students and also has research scholars pursuing a PhD in different areas. The faculty strength in the Chemistry department is thirteen and is expected to expand in the coming years with addition of new programs and research avenues. The wide range of interests and research areas among faculty members supports research scholars to pursue their own research in very different areas. These include (but are not limited to) Spectroscopy, Surface Chemistry, Biological chemistry, Photochemistry, Material Chemistry and others.

Faculty:

Currently the discipline has thirteen faculty members with wide ranging research expertise, the discipline also has about twenty research scholars pursuing PhD in different areas.

Expertise and Research Areas

1. Synthesis and molecular structures of organometallic clusters, mixed metal clusters, their reactivity and activation of organic molecules on them and use of metal carbonyls in catalytic processes.

   Faculty Members working in the above areas: Dr Pradeep Mathur.

2. Organic Synthesis, Peptide and DNA based nanostructured materials, Systems Chemistry, Biosensors and Supramolecular electronics, Organic Electronics, Photonics and Functional Dyes.

   Faculty members working in the above areas: Drs Apurba Das and Rajneesh Mishra

3. Synthesis of natural products, Design and synthesis of heterocycles and carbocycles of biological importance, Design, synthesis and diagnostic applications of new targeting ligands for cancers and inflammatory diseases, Drug delivery systems, near-infra red fluorescence, nuclear Imaging and bio-conjugate chemistry, Green Chemistry, Synthetic Transformation, Assymetric synthesis.

   Faculty members working in the above areas: Drs Chelvam Venkatesh and Sampak Samanta.

4. Transition-Metal Coordination Chemistry, Inorganic and Organometallic Pharmaceuticals, Activation of Small Molecules by Coordination with Biological and Industrial Significance, Synthetic organomettalic and coordination Chemistry of transition materials, nano particles for catalysis.

   Faculty members working in the above areas: Drs Suman Mukhopadhyay and Sanjay Kumar Singh

5. Synthesis and structural characterization of (a) metal chalcogenized clusters. (b) coordination polymers. (c) Inorganic co-crystals, Solid-State Studies by employing SCSC techniques to the metal complexes, Time-Resolved X-ray Crystallography, Designing of newer class of MOF's and studying their solid-state properties, Flourescence Spectroscopy.

   Faculty Members working in the above areas: Drs Mobin Shaikh and Anjan Chakraborty.

6. Computational Chemistry, Structural evolution of Nanoclusters and Nanoalloys, Global Optimization Methods, Algorithms for predicting Transition State and DFT Guided Monte Carlo Simulations Computational Material Science, Atomistic Modelling on Clean Energy Materials, Hydrogen Storage and Production (Photo catalysis), Li-ion Batteries, Fuel Cell, Surface Catalysis and Molecular Electronics.

   Faculty members working in above areas: Drs Bulusu Satya Silendra and Biswarup Pathak.

7. Nanostructured Materials, Polymer composites, Biomimetic materials chemistry and self and directed assembly of organic-inorganic materials. Single molecule fluorescence imaging using TIRFM, Single molecule spectroscopy in heterogeneous media, Developing high resolution optical microscope and Ultrafast fluorescence spectroscopy.

   Faculty Members working in the above areas: Drs Tridib Sharma and Tushar K Mukherjee.

SELECTED PUBLICATIONS:

1. Photophysical and Photodynamical Study of Fluoroquinolone Drug Molecule in Bile Salt Aggregates, R. Thakur, A. Mallick and **A. Chakraborty**, *Photochemistry and Photobiology*, **2012**, DOI: 10.1111/j.1751-1097.2012.01175.x.

2. Sonication Induced Peptide-appended Bolaamphiphile Hydrogels for in situ Generation and Catalytic Activity of Pt Nanoparticles, I. Maity, D. B. Rasale and **A. K. Das,** *Soft Matter*, **2012**, *8*, 5301-5308.

3. R. Maragani, T. Jadhav, S. M. Mobin and **R. Misra**, *Tetrahedron*, **2012**, DOI 10.1016/ j.tet.2012.06.094.

4. Donor–acceptor perylenediimide–ferrocene conjugates: synthesis, photophysical, and electrochemical properties, B. Dhokale, P. Gautam and **R. Misra**, *Tetrahedron Letters,* **2012**, *53*, 2352–2354.

5. Optical limiting performance of meso-tetraferrocenyl porphyrin and its metal derivatives, P. Gautam, B. Dhokale, V. Shukla, C. P. Singh, K. S. Bindra and **R. Misra**, *J. Photochem. Photobiol. A*, **2012**, *239*, 24-27.

6. Photolytic Reaction of substituted (ethynyl)benzaldehyde and Fe(CO)5: Formation of indenone and chelated iron complexes.
   P. Mathur, B. Jha, A. Raghuvanshi, R. K. Joshi, and M. M. Shaikh,
   J. Organomet. Chem., **2012**, *1*, 7-14.

7. Synthesis and characterization of some single source molecular precursors for the preparation of homogenous zirconia-silica materials by hydrolytic sol-gel process in organic media. Crystal structures of $[Zr\{OSi(O^tBu)_3\}_4(H_2O)_2].2H_2O$ and $[Ti(O^tBu)\{OSi(O^tBu)_3\}_3]$,
   V. Dhayal, A. Chaudhary, B. L. Choudhary, M. Nagar, R. Bohra, M. M., Shaikh and **P. Mathur**
   *Dalton Trans.***2012**, *41*, 9439-9450

8. One pot synthesis of maleimide and hydantoin by Fe(CO)5 catalyzed [2 + 2 + 1] co-cyclization of acetylene, isocyanate and CO
   P. Mathur, R. K. Joshi, D. K. Rai, B. Jha and M. M. Shaikh, M. M. *Dalton Trans.* **2012**, *41*, 5045-5054.

9. Organotellurium halides: New ligands for transition metal complexes, Y. Torubaev, A. Pasynskii and **P. Mathur**, *Coord. Chem. Rev.*, **2012**, *256*, 709.

10. Synthesis and Characterization of CdSe Quantum Dots by UV-Vis Spectroscopy, P. Kwizera, A. Angela, M. Wekesa, M. J. Uddin and **M. M. Shaikh** *Macro to Nano Spectroscopy*, **2012**, *Chapter 5*.

11. Bis[(2-(2-hydroxyethyl)pyridine-$\kappa^2 N\ O$]bis(pivrato- $\kappa\ O^1$) Copper (II),

    M. M. Shaikh, V. Mishra, P. Ram and A. Birla.

    ActaCryst. Sec. E., **2012**, *E68,* m1055

12. Synthesis, structure and redox property of first 1,2,3-triselenole, P. Mathur, D. K. Rai, M. Tauqeer, R. K. Joshi, G. K. Lahiri, **S. M. Mobin**, *J. Organomet Chem.*, **2012** (Under Revision).

13. Photolytic reaction of substituted (ethynyl)benzaldehyde and Fe(CO)5: Formation of indenone and chelated iron complexes, Pradeep Mathur, Badrinath Jha, Abhinav Raghuvanshi, Raj Kumar Joshi, **M. M. Shaikh**, *J. of Organomet.Chem.*, **2012**, *712,* 7-14.

14. Novel semiconducting metal-organic framework: Synthesis, structural characterisation and electrical conductivity studies of manganese based two dimensional coordination polymer, M. Karthikeyan, B. Bhagyaraju, C. M. Mariappan, **M. M. Shaikh** and B. Manimaran, *Inorg. Chem. Communications*, **2012**, *20*, 269-272.

15. Synthesis of functionalized and fused furans and pyrans from the Morita-Baylis-Hillman acetates of nitroalkenes, D. K. Nair, **M. M. Shaikh**, and N. N. I. Namboothiri, *Tetrahedron Lett.,* **2012**, *53(26)*, 3349-3352.

16. Influence of nitrosyl coordination on the binding mode of quinaldate in selective ruthenium frameworks. Electronic structure and reactivity aspects, A. D. Chowdhury, P. De, **M. M**. **Shaikh** and G. K. Lahiri, *RSC Advances*, **2012**, *2*, 3437-3446.

17. One pot synthesis of maleimide and hydantoin by Fe(CO)5 catalyzed [2 + 2 + 1] co-cyclization of acetylene, isocyanate and CO, P. Mathur, R. K. Joshi, D. K. Rai, B. Jha and **M. M. Shaikh,** *Dalton Trans.* **2012**, *41*, 5045-5054.

18. 9-Oxidophenalenone: A Noninnocent β-Diketonate Ligand? A. Das, T. M. Scherer, **M. M. Shaikh**, W. Kaim and G. K. Lahiri, *Inorg. Chem.*, **2012**, *51*, 4390-4397.

19. Correspondence of RuIIIRuII and RuIVRuIII Mixed Valent States in a Small Dinuclear Complex, H. Agarwala, T. M. Scherer, S. Maji, T. K. Mondal, **M. M. Shaikh**, J. Fiedler,

F. A. Urbanos, R. Jimenez-Aparicio, W. Kaim and G. K. Lahiri, *Chem. Eur. J.* , **2012**, *18*, 5667-5675.

20. Selective recognition of fluoride and acetate by a newly designed ruthenium framework: experimental and theoretical investigations, T. Kundu, A. D. Chowdhury, D. De, **M. M. Shaikh**, V. G. Puranik, A. Datta and G. K. Lahiri, *Dalton Trans.*, **2012**, *41*, 4484-4496.

21. Varying structural motifs in oxyanions (NO3-, CO32-) and phenoxyacetate (PhOAc-) bridged coordination polymers derived from alkoxo-bridged dicopper building blocks with {Cu2O2} core, M. M. Shaikh, A. K. Srivastava, **P. Mathur** and G. K. Lahiri, *RSC Advances*, **2011**, *1*, 893-902.

22. Crystal Structure and Energy Optimization of Dichlorobis (ethylanthranilatonicotinamide)Zinc(II), V. K. Narayanan, R. S. Gopalan, D. Chakrabarty, M. M. Shaikh and **P. Mathur**, *Journal of Chemical Crystallography*, **2011**, *41*, 801-805.

23. Chemically modified oximato complexes of titanium(IV) isopropoxide as new precursors for the sol-gel preparation of nano-sized titania: Crystal and molecular structure of [Ti{ONC10H16}4·2CH2Cl2], A. Chaudhary, V. Dhayal, M. Nagar, R. Bohra, M. M. Shaikh and **P. Mathur**, *Polyhedron*, **2011**, 30, 821-831.

24. Synthesis and molecular structure of [((CO)3RuBr2)2(μ-SePh)2Ru(CO)4] cluster with a Ru3Se2 chain core, Y. Torubaev, **P. Mathur**, A. Pasynskii, *Journal of Organometallic Chemistry*, **2011**, *696*, 832-834.

25. Crystal Structure and Phase Transition of Diglycine Perchlorate, L. Panicker, **P. Mathur**, M. M. Mobin, *Journal of Chemical Crystallography*, **2011**, *41*, 147-154.

26. Cyclodimerization of phenyliodoacetylene with elemental tellurium: New pathway to 1.3-ditellurofulvenes, Y. Torubaev, **P. Mathur**, B. Jha, M. M. Shaikh and I. V. Skabitsky, *Journal of Organometallic Chemistry*, **2011**, 696, 496-503.

SELECTED CONFERENCE PRESENTATIONS

1. Coupling reaction of 1-ferrocenyl-4-phenyl-1,3-butadiyne and bis (trimethylsilylethynyl)ferrocene with iron pentacarbonyl Ji, R. S.;
Mathur, P.; Shaikh, M. M.

Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, 2011

2. Distinguished role of iron pentacarbonyl toward the reaction of acetylenes and isocyanates under photochemical and thermal reaction conditions
   Jha, Badrinath; **Mathur, Pradeep**; Joshi, Raj K.; Mobin, Shaikh M.
   Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-March 29, 2012

3. Reaction of 3-ferrocenylpropynal with iron carbonyl and chalcogenised iron carbonyl clusters: Formation of new ligands; [Fe(CO)3-η4-(FcC2CHO)2], [Fe(CO)2{η2:η2-(FcC2CHO)2Fe(CO)3-μ-CO}] and 1,2,3-triselenole
   Rai, Dhirendra K.; Tauqeer, Mohd.; Shaikh, Mobin M.; **Mathur, Pradeep**
   Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-March 29, 2012

RESEARCH SCIENTIST

Dr. Deepa Dey

Project Summary

The project work is focused on the developments of non-stoichiometric metal oxide material (Ti, V, Nb, Zr etc.) as potential photocatalyst to be used in solar cell development. The idea originates from the fact that non-stoichiometric oxides have unpaired electron that show electrical as well as magnetic behavior. We want to exploit these inherent physico chemical properties towards improvised solar energy conversion.

Apart from this work we are also interested in size and shape directed synthesis of coordination polymer nanoparticle taking advantage of various synthetic techniques such as emulsion, polymerization, hydrothermal, microwave and sonochemical methods.



Dual Core Oxford Diffraction (Now Agilent Technologies) Super Nova System

RESEARCH PROJECTS

Name of the project	PI/Co-PI	Budget Sanctioned (`)	Overheads (`)	Duration	Starting date	Funding agency	Project staff
1. New Computer Modelling Techniques for Studying Nanoalloy Clusters	Dr. Satya. S. Bulusu				Submitted	CSIR	
2. To investigate the photoluminescence properties of water soluble biocompatible quantum dots by using single molecule total internal reflection fluorescence microscopy	Dr. Tushar Kanti Mukherjee	24,90,000			Submitted	CSIR	
3.Study of Half Sandwich Ru and Rh Complexes based on Nitrogen and Phosphorous Donor Ligands	Dr. Sanjay. K. Singh	22,27,200				CSIR	
4."Studies on Targeted Oragometallic Anticancer Drugs and their Mode of Actio"	Dr. Suman Mukhopadhyay					DST	
5. Heteronuclear Coordination Polymers Inspired by Cycloaddition and Hydrogen Bonds : Towards Dynamic Porous Metal organic Frameworks	Dr. Suman Mukhopadhyay	18,00,000		3 years	01-04-2011	CSIR	Manideepa Saha (JRF)
6. Development of Novel Organocatalyst for Asymmetric (4+2) Diels-Alder Reaction of α-Substituted-α,β-Unsaturated Aldehydes or Ketones with Dienes: Access a Chiral Quaternary Carbon Center	Dr. Sampak Samanta	23,000,00		3 years	01-04-2012	CSIR	SRF
7. Size and Shape Controlled Magneto-Optical Nanoparticles for Cancer Cell Imaging and Photo-thermal therapy.	Dr. Tridib K Sarma	50,00,000	10,00,000	3 years	October 2011	DST	Not yet appointed
8. DST Women Scientist Scheme	Dr. Deepa Dey	22,80,000	3,00,000	3 years	16th August 2011	(DST)	None

8. Generation of dynamic peptide libraries towards the applications in biology and nanosciences	Dr. Apurba K. Das				Submitted	CSIR	
9. Development of Organocatalytic Mediated Asymmetric Synthesis of Highly Functionalized Tetrahydrocarbazole Derivative as a Privileged Structure	Dr. Sampak Samanta	Submitted	37,000,00	3 years		DST	NA

Picture and List of Hi-tech facilities and a brief write-up:

During this year, following equipments/facilities were added to the laboratory. These are:

Details of instruments equipped as a part of SIC

Name	Brand	Cost Rs.	Date of PO	Date of Installation
Single Crystal X-ray Diffractometer	Agilent Technologies	1,62,59,000.00	14 / 01/ 2011	September 2011
NMR	Bruker Biospin International AG	1,46,66,474.00	14 / 01/ 2011	October 2011
HR Mass Spectrometer	Bruker Daltonics GmbH	1,57,27,500.00	14 / 01/ 2011	December 2011
Elemental Analysis	Thermo Fischer Scientific	18,73,264.00	14 / 01/ 2011	
Thermal Analysis (TGA /DTA)	Mettler Toledo	15,58,000.00	05 / 05 /2010	April 2012

Liquid Chromatography Mass Spectrometry



Individual honorary work by faculty members:

1. External Referee for Master of Engineering / Technology or M.Phil. /M.S. theses: 1 (Dr. Suman Mukhopadhyay)

2. Dr. Shaikh M. Mobin:- Convenor for 1st Agilent Technologies Single Crystal X-ray Diffractometer User Meet on March 19 -20, 2012 at IIT Indore. The single crystal X-ray Diffraction facility had organized 1st Agilent Technologies Single Crystal X-ray Diffractometer User Meet on March 19 -20, 2012 at IIT Indore. It was witness by eminent scientists around India. The whole budget was sponsor by Agilent Technologies with local hospitality by IIT Indore. IIT Indore becomes the 1st institute to hold this meet.

Dr. S. S. Bulusu, Dr. B. Pathak, Dr. S. K. Singh, Dr. S. M. Mobin and Dr. C. Venkatesh have joined in the Discipline of Chemistry in the last academic year



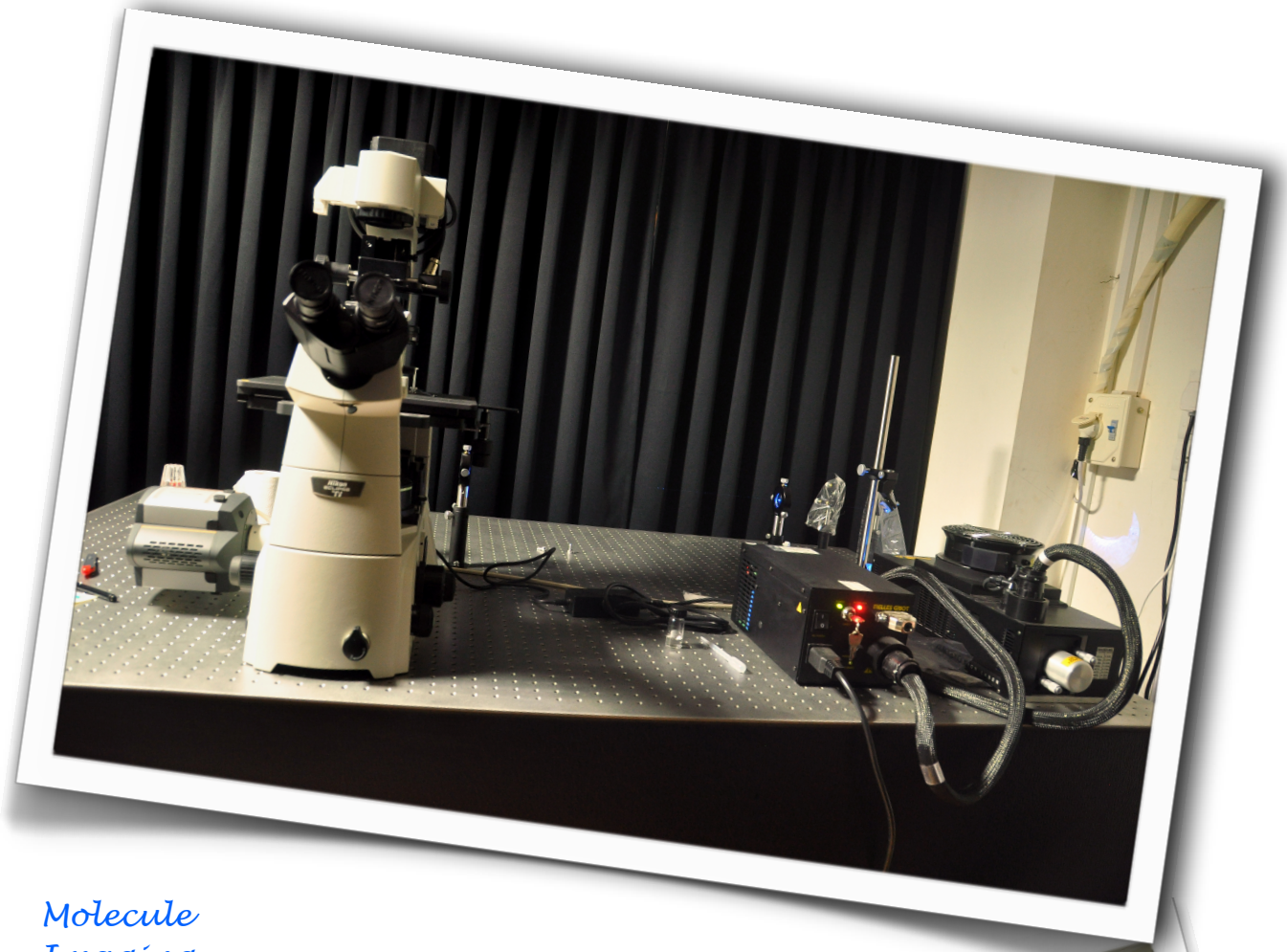
Analytical High Performance Liquid Chromatography (HPLC). (Two HPLC systems, One Ultimate 3000 and YL9100 HPLC system)



Nuclear Magnetic Resonance 400 MHz



Oxford Diffraction (Now Agilent Technologies) Super Nova System



Molecule Imaging Using Total Internal Reflection Fluorescence Microscopy



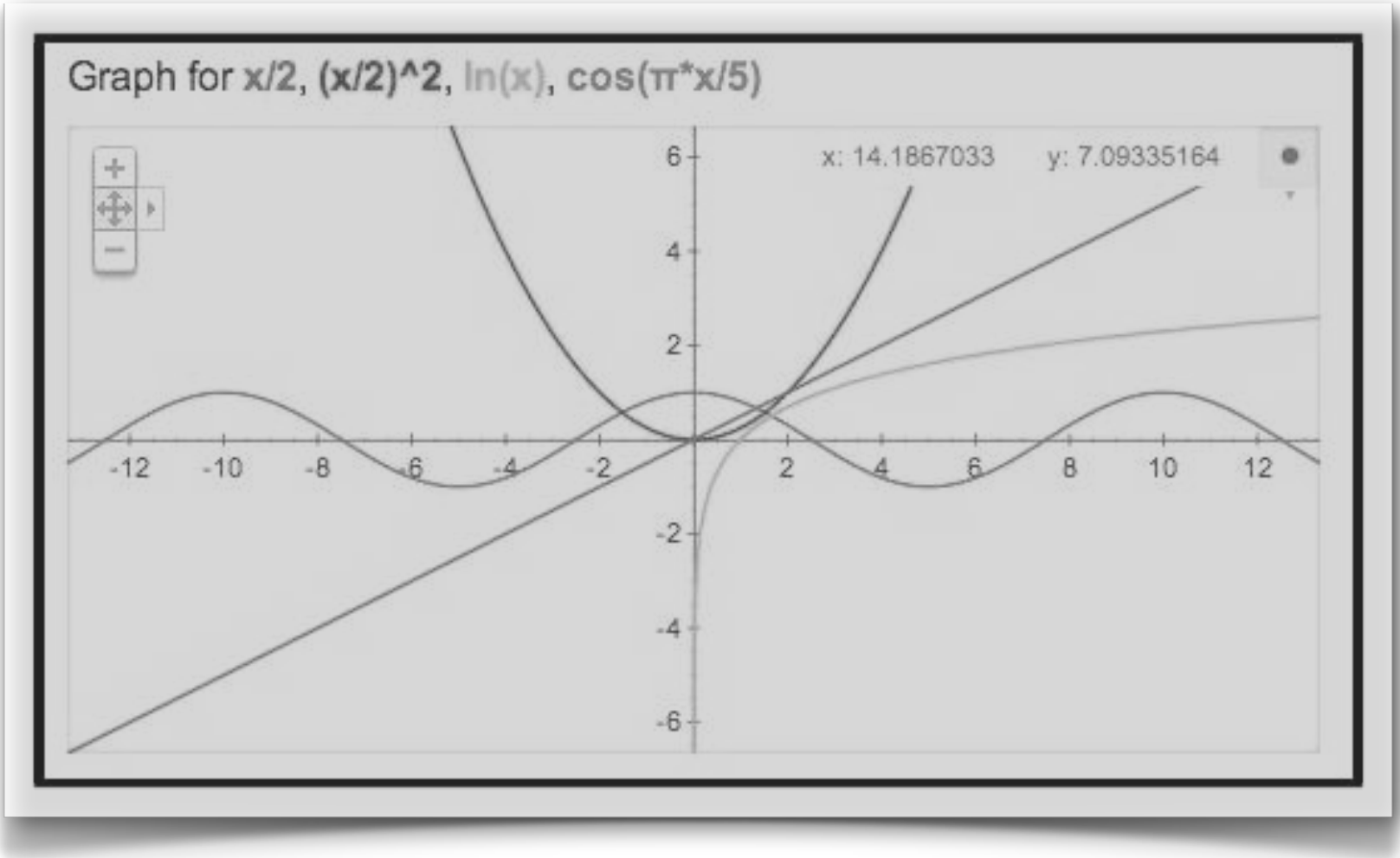
Student Lab



Thermal Analysis (TGA AND DSC)


आभासीय कक्षा
VIRTUAL CLASSROOM
भारतीय प्रौद्योगिकी संस्थान इन्दौर
TECHNOLOGY INDORE

DISCIPLINE OF MATHEMATICS



FACULTY AND RESEARCH



Dr Anand Prakash

Algebra Complex Analysis
Metric Spaces and Topology



Dr Anthony Vijesh

Applied Functional Analysis



Dr Md Aquil Khan

Modal Logic
Rough Set theory and Applications



Dr Niraj Kumar Shukla

Wavelet Analysis
Harmonic Analysis



Dr Safique Ahmad

Numerical Linear Algebra
Stochastic Differential Equations



Dr Swadesh Kumar Sahoo

Complex Analysis
Geometric Function Theory
Hyperbolic Metrics

Quasi conformal Mappings



Dr Venku Naidu Dogga

Harmonic Analysis
Time-Frequency Analysis
Multiplier Theory

Discipline of Mathematics

Mathematics discipline was initiated at IIT, Indore in July 2009. The department currently offers undergraduate Math courses for BTech students and has research scholars pursuing a PhD in varied areas. The faculty strength in the Computer Science discipline is eight and is expected to expand in the coming years. However, the wide range of research interests and projects of different faculty members ensure that students are exposed to the latest research and developments in the field. These include (but are not limited to) Experimental designs and Data Analysis, Conformal Mapping, Numerical Linear Algebra, Topology, Probability and Ergodic Theory.

Faculty:

Currently the discipline has eight faculty members including visiting faculty; the discipline has plans to expand its strength and offerings in the coming years. Mathematics also has five research scholars pursuing a PhD.

Expertise and Research Areas:

1. Algebraic Topology, Numerical Linear Algebra, Stochastic Differential Equations, Stability Analysis.

   Faculty Members working in the above areas: Drs Safique Ahmad, K.D. Joshi and Anand Parkash.

2. Ergodic Theory, Harmonic Analysis and Probability Theory.

   Faculty Members working in the above areas: Dr M G Nadkarni

3. Complex Analysis (Univalent functions, Quasi-conformal analysis, hyperbolic type metrics), Applied Functional Analysis.

   Faculty Members working in the above areas: Drs Swadesh Kumar Sahoo and Antony Vijesh.

4. Wavelet Analysis, Harmonic Analysis, Abstract Harmonic Analysis (Segal-Bargmann transforms, Time-Frequency Analysis, Multiplier theory).

Faculty members working in the above areas: Drs Niraj Kumar Shukla and Venku Naidu Dogga.

Research Project:

Perturbation Analysis on Singular Multiparameter Eigenvalue Problems with Various Structures (DST First Track).

Principal Investigator: Dr Safique Ahmad

SELECTED PUBLICATIONS:

1. S. S. Ahmad and V. Mehrmann. Perturbation analysis for complex symmetric, skew symmetric, even, and odd matrix polynomials, *ElectronicTransactions on Numerical Analysis (ETNA)*, Vol. 38, pp. 275-302, 2011.

2. M.G. Nadkarni. Basic Ergodic Theory 3rd Edition, Under contract. Hindustan Book Agency, New Delhi.

3. M. G. Nadkarni: Reviewed research papers for the journals Studia Mathematics, Proceedings of the Indian Academy of Sciences (Mathematical Sciences), Mathematical Reviews

4. K.D. Joshi, Pr 'Foundations of Discrete Structures. Under contract with Newage Publishers, New Delhi.

CURRENT RESEARCH PROJECTS:

Dr. Sk. Safique Ahmad: Structured Polynomial eigenvalue problems associated with Delay differential equations and control theory problems; Also, the logarithmic norm for matrix pencils associated with DAE and Stochastic Differential Equations**.**

Prof. M. G. Nadkarni: Statistical Analysis of National Sample Survey Organisations (NSSO) many years of data on Monthly Percapita Consumer Expenditure (MPCE) for rural and urban households. With the assistance of Vijesh Antony and Ankush Goswami.

Individual honorary work by faculty members:

1. Lectures to help students of Shivaji University for the NET and SET examinations.
2. Lectured at a workshop on Ergodic Theory held in December 2011 at Kerala School of Mathematics, Calicut (5 lectures).
3. Gave a talk at the conference in honour of V.S. Sunder at IMSc, Chennai, April 4-7, 2012.
4. Institute Representative for GATE 2012 And JEE 2012 Exam.
5. Talk on "An invariance property under quasiconformal mappings" at the International Workshop on Complex Analysis and its Applications" held in Sangli, Maharashtra, during June 11-15, 2012.
6. Served as a Mathematics expert in K.V.P.Y interview panel.

Faculty involved in the above activities: Drs Swadesh Kumar Sahoo, MG Nadkarni, Antony Vijesh, Anand Parkash and Safique Ahmad.

PROFESSIONAL ASSOCIATIONS:

Dr. Sk. Safique Ahmad: Member, Orissa Mathematical Society, India
Dr. Antony Vijesh: Member, Forum for Interdisciplinary Mathematics, India
Dr. Swadesh Kumar Sahoo: Technical Editor of Journal of Analysis published by Forum d' Analystes, Chennai.

.

DISCIPLINE OF PHYSICS



FACULTY AND RESEARCH



Dr Ankhi Roy

Hadron Physics
Physics beyond Standard Model
Multivariate Analysis Techniques



Dr Krushna R Mavani

Terahertz Spectroscopy
Condensed Matter Physics



Dr Manavendra N Mahato
Guage/Gravity Correspondence
String Theory
Relativity and Quantum Field Theory
Holographic Condensed Matter



Dr P.N. Puntambekar
Gas Lasers
He-Ne Lasers
Dye Lasers
Interferometry and Laser Application



Dr Pankaj Sagdeo

Crystallography
Highly Co-related Electron Systems
Resistivity and Magnetism
Thin Film Growth



Dr Preeti A Bhope

Experimental Condensed Matter
X-Ray Absorption Fine Structure (XAFS)
Photoemission Spectroscopy (PES)



Dr Raghunath Sahoo

High Energy Nuclear Physics
Phenomenology of Quark Gluon Plasma, Global Properties and Heavy Flavors



Dr Rajesh Kumar

Experimental Solid State Physics
Organic and Inorganic Semiconductors
Nanostructures, Raman and PL Spectroscopy



Dr Sarika Jalan

Complex Biological Networks
Spectral graph Theory, Random Matrix Theory
Synchronization, Adaptation, Evolution



Dr Siddarth Savyasachi Malu

Radio Astronomy
Instrumentation for Radio Astronomy
Cosmic Microwave Background



Dr Subhendu Rakshit

Particle Physics
Neutrino Physics, Supersymetry
Hadron Collider Physics
Neutrino Astronomy



Dr Sudeshna Chattopadhyay
Surfaces and Intersurfaces
Soft Matter and Nano Materials
Interfaces within Colloids
Electrode/Electrolyte Interfaces

DISCIPLINE OF PHYSICS

The discipline of Physics was initiated at IIT, Indore in July 2009. The department currently teaches Physics courses to undergraduate BTech students and also has a PhD program in various areas of the discipline. The discipline will be commencing its two year MSc program in the next academic year 2013-2014. The faculty strength in the Physics department is eleven and it is likely to expand in the coming years. Physics at IIT, Indore is experiment driven both in research and pedagogy; the department is committed to fostering innovation in the Institute's engineering departments through the demands of our cutting-edge experimental research projects. Three of our faculty members - Profs. Raghunath Sahoo, Ankhi Roy and Subhendu Rakshit - have been directly and indirectly involved with the CERN experiments that have led to the discovery of the Higgs Boson. With several planned experiments in Condensed Matter physics and astrophysics, we intend to span most major areas in physics and provide a successful model for a research and teaching department which leads research programs, collaborates with other departments (with a view to making IIT Indore a self-sufficient research institution) and shares the excitement of discovery.

FACULTY:

The department currently has eleven faculty members working in diverse areas of research. These include (but are not limited to) Synchronized clusters on networks, origin of multi-ferrocity in thin film oxides, ADF-CFT correspondence, theoretical, experimental and phenomenological high energy physics, lasers, Raman and Photoluminescence Spectroscopy and Astrophysics.

Expertise and Research Areas:

1. Investigations on ferroelectric, magnetic and structural co-relations in RMNO3 Multi-Ferroic thin films.

The aim is to synthesize high quality thin films of $RMnO_3$ using pulsed laser deposition method and study the structural, magnetic and multiferroic properties. We also intend to study the effects of strain arising due to lattice mismatch between substrate material and thin film material.

2. Analysis of gene expression Data of Zebra-fish under Random Matrix theory and Complex Networks Framework.

The study analyzes microarray data under the framework of complex networks and spectral theory.

3. Radiative decays of the Omega-meson with WASA-AT-COSY

The main focus of the project is to study one of the major decay channel of omega meson i.e. Information about the production reaction is available from the previous CELSIUS/WASA analysis and we should reproduce the same result with the present data set of pd and calculate the production cross-section from the pp data as well. We intend to investigate one Dalitz decay channel ω ηe + e . The branching ratio of this decay channel is not quoted by the Particle Data Group.

4. ALICE EXPERIMENT AT LHC: The ALICE Experiment at CERN, Geneva is going in search of answers to fundamental questions, using the extraordinary tools provided by the LHC (Large Hadron Collider):

   The department will be involved in the Indian PMD (Photon Multiplicity Detector) operation and data taking along with data analysis for the measurement of photon multiplicity and other characteristic phenomenon like flow and fluctuation. We will participate in the ALICE upgradation for the FOCAL (Forward Calorimeter), where many interesting physics issues could be addressed.

5. Proposal for Detector Development for QCD studies with Anti-Protons at The Facility for Anti-Proton and Ion Research (FAIR): Indian Contribution to PANDA.

   The Facility for Antiproton and Ion Research (FAIR) is a future project at GSI which will extend hadron physics studies up to the charm meson region using antiproton beams together with a state-of-the-art detector antiproton annihilation at Darmstadt (PANDA). The project work in India will consist of several parts: studies of silicon micro-strip detector, development of a scintillator hodoscope with silicon photomultiplier (SiPM) readout, studies of SiPM as photon counter and simulation studies of the detector design as well as physics case studies. IIT Indore will focus on the studies of SiPM as a Photon counter.

SELECTED PUBLICATIONS

1. Probing the QGP phase boundary with Thermal Properties of Mesons, **Raghunath Sahoo** et al., International Journal of Modern Physics A (2011) (In press)

2. Constituent Quarks and Multi-strange baryon production in heavy ion collisions, **Raghunath Sahoo**, Nirbhay K. Behera and Basanta K. Nandi (Submitted to Phys. Rev. C)

3. _Rapidity and transverse momentum dependence of inclusive J/psi production in pp collisions at = 7 TeV. K. Aamodt, **Raghunath Sahoo** et al. (ALICE Collaboration),

Phys.Lett. B (2011) (In press)

4. Production of pions, kaons and protons in pp collisions at = 900 GeV with ALICE at the LHC, K. Aamodt, **Raghunath Sahoo** et al. (ALICE Collaboration), Eur.Phys.J. C71 (2011) 1655

5. Femtoscopy of pp collisions at =0.9 and 7 TeV at the LHC with two-pion Bose-Einstein correlations. K. Aamodt, ,**Raghunath Sahoo** et al. (ALICE Collaboration), e-Print: arXiv:1101.3665 [hep-ex]

6. Two-pion Bose-Einstein correlations in central Pb-Pb collisions at $_{NN}$ = 2.76 TeV. K. Aamodt, **Raghunath Sahoo** et al. (ALICE Collaboration), Phys.Lett. B696 (2011) 328-337

6. Centrality dependence of the charged-particle multiplicity density at mid-rapidity Pb-Pb collisions at $_{NN}$ = 2.76 TeV. K. Aamodt, **Raghunath Sahoo** et al. (ALICE Collaboration), Phys.Rev.Lett. 106 (2011) 032301.

7. _Suppression of Charged Particle Production at Large Transverse Momentum in Central Pb-Pb Collisions at $_{NN}$ =2.76 TeV. K. Aamodt, ,**Raghunath Sahoo** et al. (ALICE Collab-oration), Phys.Lett. B696 (2011) 30.

8. Pion femtoscopy in p+p collisions at =200 GeV, M.M. Aggarwal, , Raghunath Sahoo et al. (STAR Collaboration), Phys.Rev. C83 (2011) 064905.

9. Hydrodynamics of R-charged D1-branes. J. R. David, **M. Mahato**, S.Thakur, S.R. Wadia, Journal of high energy Physics 1101, (2011) 014.

10. Toward NS5 Branes on the Resolved Cone over Y(p,q), E. Caceras, **M. Mahato**, L.A. Pando Zayas, V.J.G. Rogers, Physical Review D 83 (2011) 066008.

11. Spectral Properties of Directed Random Networks with Modular Structure, **Sarika Jalan**, Guimei Zhu, Baowen Li , Journal-ref: Physical Review E (2011) (in press)

12. Photoproduction of η' mesons o the deuteron. I. Jaegle...**A. Roy**...et al., Euro. Phys. J. A 47 (2011)11

13. Photoproduction of ω mesons on nuclei near the production threshold. M. Nanova ., **A. Roy**,... et al., Euro Phys. J. A47(2011)16

14. Quasi-free photoproduction of η - mesons off the deuteron. I. Jaegle ., **A. Roy** et al., Euro. Phys. J. A 47 (2011)89(2010) 130-135

REFEREED CONFERENCE PROCEEDINGS

Transverse Energy Measurement in Au+Au collisions by STAR Experiment. Raghunath Sahoo (for STAR Collaboration), Indian Journal of Physics 85, 897 (2011).







SCHOOL OF ENGINEERING SCIENCES

DISCIPLINE OF ELECTRICAL ENGINEERING



Analog/Electron Devices

FACULTY AND RESEARCH



Dr Abhinav Kranti

Solid State Devices, Circuit Design
Nanotehnology
Semi-Conductor Devices
Novel MOS devices in Bulk/SOI Tech
Bipolar Transistors
A1GaN/GaN HEMTS



Dr Amod C. Umarikar

Power Electronics
Modeling and Simulation of
Engineering systems



Dr Gaurav S. Kasbekar

Modeling, Design and Analysis
of Wireless Networks
Aspects of Spectrum Allocation in Cognitive
Radio Networks



Dr M. Anbarasu

Nanoscale Phase change Elecronic
Memory Devices
Amorphous Semi-conductors
Chalcogenide Glasses



Dr Prabhat Kumar Upadhayay

Wireless Communication Techniques
Performance Analysis of Relaying Strategies
MIMO Systems



Dr Ram Bilas Pachori

Signal Processing
Communications



Dr Santosh Kumar Vishvakarma

Device Modeling: MOS Devices
Circuit Design: Ultra Low Power

SRAM Design using CMOS and Advanced CMOS devices
System Design



Dr Shaibal Mukherjee

Semiconductor Thin Film Growth
Design, Fabrication and Characterization of Opto Electronic Devices
Nano Devices based on Si-Ge and ZnO.



Dr Srivatsan Vasudevan

Photothermal Response and Imaging
Photo-Acoustic Microscopy for Bio-medical Applications
Bio-Photonics



Dr Trapti Jain

Power System Security Analysis
Power System Dynamics
FACTS Controllers
Artificial Intelligence Applications to Power Systems.



Dr Vipul Singh

Organic Electronic/Photonic Devices
Photoluminescence Spectroscopy, Thin Film Fabrication
Si Nano Devices, Single Electron Devices, Bulk and SOI MOSFETS
Low Power Information Processing Circuits and RF-SET

Discipline of Electrical Engineering

Electrical Engineering discipline was initiated at IIT, Indore in July 2009. The discipline currently offers a BTech in Electrical Engineering and has a rigorous PhD program for its research scholars. The aim of the discipline is to offer an academically challenging and rigorous curriculum for its BTech students while also mentoring cutting edge research in the field through the PhD program. Research scholars and BTech students both have access to a group of excellent faculty experienced in diverse areas of research and wide ranging expertise and interests. Students are exposed to the latest research and developments in the varied fields. These include (but are not limited to) Renewable Energy Systems, Signal processing, Communication Technology, Semiconductor devices, Thin film technology, Laser and Photo detectors, Multiple Gate MOSFETs, Bulk and Silicon-on-Insulator (SOI) technology, MEMS/NEMS Technology, VLSI/ULSI Circuit and System Design, Ultra Low Power Device and Curcuit Design, Control System Engineering and Embedded System Design.

Faculty:

Currently the discipline has eleven faculty members with a wide range of research interests. The discipline is looking to recruit exceptional faculty members to add to the existing group to make it more diverse and cutting edge in the coming years.

Expertise and Research Areas:

A. Power Electronics, Modelling and Simulation of Engineering Systems using Bond Graphs, Application of Power Electronics in Renewable Energy Systems, Application of Z-source Inverters in Grid Connected Converters.

Faculty members working in the above areas: Dr Amod C. Umarikar.

B. Bio-medical signal processing, Modeling of non-stationary signals, time frequency analysis, Signal Processing for Communications, Speech and Image Processing.

Faculty members working in the above areas: Dr Ram Bilas Pachori.

C. Semi-conductor devices, Physics, Simulation and Modeling.

Faculty members working in the above areas: Dr Abhinav Kranti.

D. Nanoscale Device and VLSI/ULSI Circuit Design, TCAD Modeling, Fabrication, Nano sensors, Nano devices and Memory design.

Faculty Members working in the above areas: Drs Santosh Kumar Vishwakarma, Vipul Singh and Shaibal Mukherjee.

E. Photothermal response and imaging, Photo acoustic Microscopy for bio-medical applications, Biophotonics.

Faculty members Working in the above areas: Dr Shrivathsan Vasudevan.

F. Wireless Cooperative Communication techniques, Wireless Network, Performance Analysis of Relaying Strategies over Wireless fading Channels, MIMO Systems.

Faculty Members working in the above areas: Drs Prabhat Kumar Upadhyaya and Gaurav S Kasbekar.

G. Nanoscale Phase change electronic memory devices, Multi bit data storage, stackable cross point memory devices, Ovonic Threshold switch selector devices, Amorphous semi-conductors, Chalcogenide glasses.

Faculty Members working in the above areas: Dr M. Anbarasu.

H. Power systems security analysis, dynamics and deregulation; FACTS controllers, Artificial Intelligence Applications to Power Systems.

Faculty Members working in the above areas: Dr Trapti Jain.

SELECTED PUBLICATIONS:

1. "Junctionless multiple-gate transistors for analog applications", R.D. Doria, M.A. Pavanello, R.D. Trevisoli, M. de Souza, C.-W. Lee, I. Ferain, N.D. Akhavan, R. Yan, P. Razavi, R. Yu, A. Kranti and J.-P. Colinge, IEEE Trans. Electron Devices, vol. 58, no. 8, pp. 2511 - 2519, 2011.

2. Dheeraj Sharma and Santosh Kumar Vishvakarma, " Analytical Modeling of 3D potential Discribution of a Rectangular Gate (RecG) Gate-All-around MOSFET in Subthreshold and Strong Inversion Regions " Microelectronics Journal, Elsevier, volume 43, issue 6, pp. 358-363, June 2012.

3. S. Mukherjee, D. Li, G. Bi, J. Ma, A. Gautam, S. L. Elizondo, F. Zhao, G. Yu, B. Weng and Z. Shi, "CaF_2 surface passivation of lead selenide grown on BaF_2", *Journal of Microelectronic Engineering*, vol. 88, 2011, pp. 314-317.

4. Hiroshi Inokawa, Wei Du, Mitsuru Kawaii, Hiroaki Satoh, Atsushi Ono and Vipul Singh: "Single Photon Detector Based on MOSFET Electrometer With Single Electron Sensitivity" *Advanced Materials Research* Vol. 222 **(2011)** 3-7.

5. Hiroshi Inokawa, Wei Du, Mitsuru Kawai, Hiroaki Satoh, Atsushi Ono and VipulSingh: "Single Photon Detection by SOI MOSFET" International Meeting for Futureof Electron Devices, Kansai (IMFEDK), IEEEXplore**(2011)** 24-25. DOI:10.1109/IMFEDK. 2011.5944826

6. Wong, C. L., G. C. K. Chen, B. K. Ng, S. Agarwal, N. Fanani, Z. Lin, S. Vasudevan, P. Chen. (2011). "Photothermal imaging of nanoparticles beyond the diffraction limit." Optical Engineering 50: 073201.

7. P. K. Upadhyay and S. Prakriya, "Outage-Optimal Opportunistic Scheduling with Analog Network Coding in Multiuser Two-Way Relay Networks," EURASIP Journal on Wireless Communications and Networking 2011, 2011:194.

8. P. K. Upadhyay and S. Prakriya, "Performance of Analog Network Coding with Asymmetric Traffic Requirements," IEEE Communications Letters, vol. 15, no. 6, pp. 647-649, June 2011.

9. P. K. Upadhyay and S. Prakriya, "Performance of Two-Way Opportunistic Relaying with Analog Network Coding over Nakagami-m Fading," IEEE Transactions on Vehicular Technology, vol. 60, no. 4, pp. 1965-1971, May 2011.

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11. G. S. Kasbekar, Y. Bejerano, S. Sarkar, "Lifetime and Coverage Guarantees Through Distributed Coordinate-Free Sensor Activation", IEEE/ACM Transactions on Networking, Vol. 19, Issue 2, April, 2011, pp. 470-483.

12. M. Anbarasu, Martin Wimmer, Gunnar Bruns, Martin Salinga and MattiasWuttig, Nanosecond threshold switching of GeTe6 cells and their potential as selector devices, Appl. Phys. Lett. 100 143505 (2012).

13. UpadhyayManisha, SeviMurugavel, M. Anbarasu and T.R. Ravindran 'Structural study on amorphous and crystalline state of phase change material', J. Appl. Phys. 110 083711 (2011)

14. M. Anbarasu and Matthias Wuttig, 'Understanding the structure and properties of phase change materials for data storage applications' invited review article in Journal of the Indian Institute of Science, 91, No 2, 259 (2011).

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16. T. Jain, S.N. Singh and S.C. Srivastava, "Fast static available transfer capability determination using radial basis function neural network" International Journal of Applied Soft Computing (Elsevier), Vol. 11, Issue 2, March 2011, pp 2756-2764.
17. R.B. Pachori and D. Hewson, "Assessment of the effects of sensory perturbations using Fourier-Bessel expansion method for postural stability analysis", Journal of Intelligent Systems, vol. 20, issue 2, pp. 167-186, August 2011.
18. R.B. Pachori and V. Bajaj, "Analysis of normal and epileptic seizure EEG signals using empirical mode decomposition", Computer Methods and Programs in Biomedicine, In press, 2011.
19. R.B. Pachori, J. Gadewadikar, and O. Kuljaca, "Classification of EEG signals based on empirical mode decomposition and Bayesian network application", Journal of the Mississippi Academy of Sciences, vol. 56, no. 1, pp. 101, January 2011.

Refereed Conference Proceedings

1. "Low Power Nanoscale RF/Analog MOSFETs", D. Ghosh, M.S. Parihar, G.A. Armstrong, and A. Kranti, Accepted, 2012 IEEE International Conference on Nanotechnology, 20-23 August 2012, Birmingham, UK.

2. "Sensitivity Analysis of steep Subthreshold Slope (S–slope) in JunctionlessNanotransistors", M.S. Parihar, D. Ghosh, G.A. Armstrong, R. Yu, P.

Razavi, S. Das, I. Ferain, and A. Kranti, Accepted, 2012 IEEE International Conference on Nanotechnology, 20-23 August 2012, Birmingham, UK.

3. C. B. Kushwah, S.K.Vishvakarma, "Ultra low power Sub-Threshold SRAM Cell Design to Improve Read Static Noise Margin " 16th International Symposium of VLSI Design and Test (VDAT)-2012, July 1st-4th, 2012, Bengal Engineering and Science University, Shibpur, India.

4. Tor. A. Fjeldly, U. Monga and S. K. Vishvakarma, " Compact Unified modeling of Multogate MOSFETs based on Isomorphic modeling functions" 8th, IEEE, International Caribbean Conference on Devices, Circuits and Systems-2012 (ICCDCS-2012), March 14-17, 2012, Playa del Carmen, Mexico (Invited Paper).

5. Dheeraj Sharma and S. K. Vishvakarma, "Analytical Modeling of the Subthreshold Potential of Nanoscale GAA Rectangular Gate MOSFET", *International Workshop on Physics of Semiconductor Devices (IWPSD), Dec. 2011*, IIT Kanpur, India.

6. Saurabh Kumar Pandey, ShrutiVerma, Sushil Kumar Pandey and **Shaibal Mukherjee**, "Theoretical investigation of MgZnO/CdZnO/MgZnO double heterostructure bluish LED with improved internal quantum efficiency," proceedings of IEEE Xplore, 2012, *4th International Conference on Electronics Computer Technology (ICECT)*, Kanyakumari, India, April 6-8, 2012.

7. Sushil Kumar Pandey and **Shaibal Mukherjee**, "High Performance from ZnO Multiple Quantum-Well Green Light Emitting Diode with Li-Doped CdZnO Active Region," *IEEE NANO 2012 - 12th International Conference onNanotechnology*, August 20-23, 2012, International Convention Centre, Birmingham, UK.

8. P. K. Upadhyay and S. Prakriya, "Outage Performance of MIMO Two-Way AF Relaying with End-to-End Antenna Selection," to be presented at IEEE Sarnoff Symposium 2012, Newark, New Jersey, May 2012.

9. P. K. Upadhyay and S. Prakriya, "Performance Bounds for Analog Network Coding based Two-Way Relaying with Multiuser Selection Diversity," in Proc. IEEE Wireless Communications and Networking Conference (WCNC), Cancun, Mexico, Mar. 2011.

10. P. K. Upadhyay and S. Prakriya, "Outage Analysis of User Scheduling with Antenna Selection in Multiuser Two-Way AF Relaying," in Proc. International Conference on Devices and Communications (ICDeCom), BIT Mesra, India, Feb. 2011.

11. G. S. Kasbekar, S. Sarkar, “Pricing Games among Interconnected Microgrids”, To appear in Proceedings of 2012 IEEE Power & Energy Society General Meeting, San Diego, CA, USA, July 22-26, 2012.

12. G.S. Kasbekar, S. Sarkar, “Spectrum Pricing Games with Arbitrary Bandwidth Availability Probabilities”, in Proceedings of ISIT, St. Petersburg, Russia, July 31-August 5, 2011.

13. Trapti Jain and Arvind Jain, “Implementation of artificial neural networks in real time power systems: Challenges and Issues”, 5th Indian International Conference on Artificial Intelligence (IICAI-11) organized in Tumkur, India during December 14-16, 2011.

14. V. Bajaj and R.B. Pachori, "Application of the sample entropy for discrimination between seizure and seizure-free EEG signals", Proceedings 5th Indian International Conference on Artificial Intelligence, 14-16 December, 2011, Tumkur, India, Accepted for publication.

15. P. Jain and R.B. Pachori, "A new approach for glottal closure instants detection from speech signals", Proceedings 5th Indian International Conference on Artificial Intelligence, 14-16 December, 2011, Tumkur, India, Accepted for publication.

16. R.B. Pachori and D. Hewson, "Identification of time-varying effects of sensory perturbations for postural stability analysis", Proceedings 5th Indian International Conference on Artificial Intelligence, 14-16 December, 2011, Tumkur, India, Accepted for publication.

• **Chapter (Books)**

4. **Mukherjee, S.,** *“*Photonic bandgap defect structure based on IV-VI semiconductor: Lasing cavity without cleaving*”* In *Light-Emitting Diodes and Optoelectronics: New Research,* ed. Joshua T. Hall and Anton O. Koskinen. NOVA Publisher, 2012, at press.

5. R.B. Pachori and P. Sircar, Nonstationary Signal Analysis: Methods based on Fourier-Bessel Representation, LAP LAMBERT Academic Publishing, Saarbrucken, Germany, 2010, ISBN: 9783-8433-8807-8.

A. CURRENT RESEARCH PROJECTS/CONSULTANCIES

1. Dr. S. K. Vishvakarma**,"Unified and Compact Analytical Modeling of Nanoscale Gate-All-Around Multigate MOSFETs,"** Department of Science & Technology (DST), Science and Engineering Research Council (SERC), Fast Track Scheme for Young Scientists **Project No. SERC_ET0280-2010.**

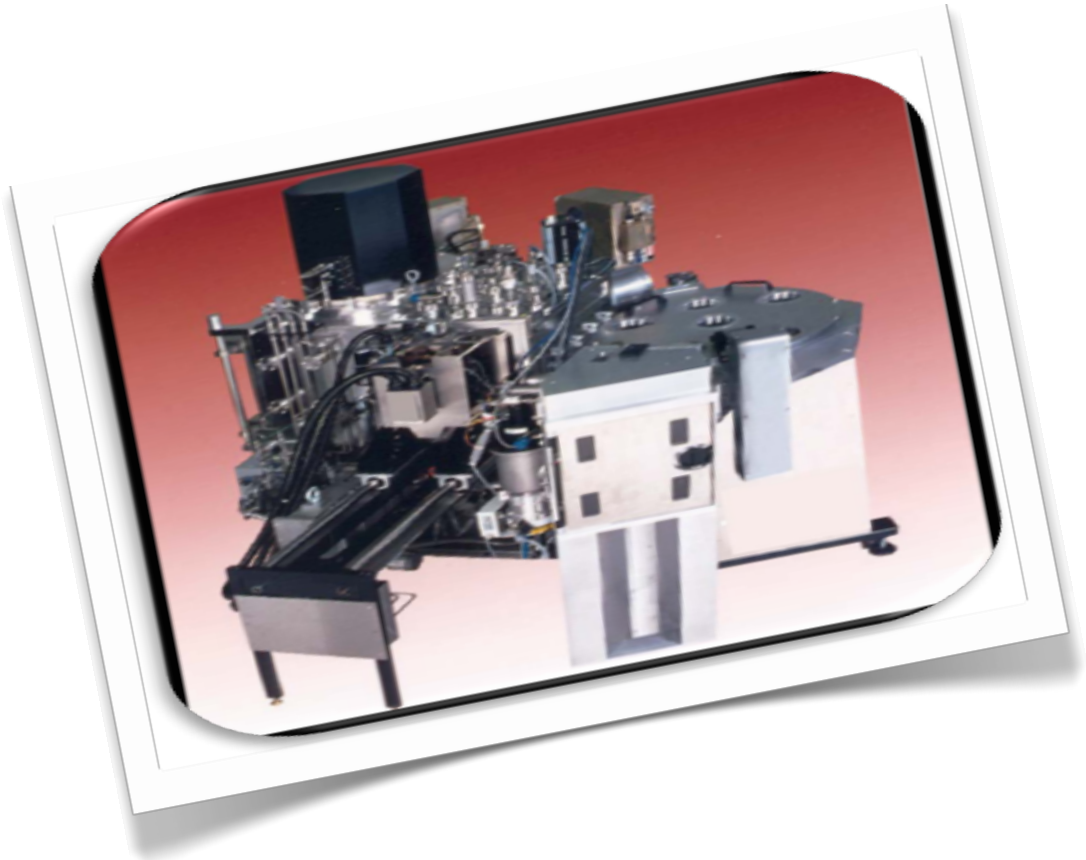
2. Dr. **Shaibal Mukherjee "**Design, fabrication and characterization of high-quality zinc oxide (ZnO) nanostructure-based nano-devices" Department of Science and Technology (DST) Fast Track Scheme for Young Scientists.

3. Dr. Ram Bilas Pachori "Analysis and classification of EEG signals based on nonlinear and nonstationary signal models." Department of Science & Technology (DST), (2011-2014)

Infrastructure and Research Facilities:

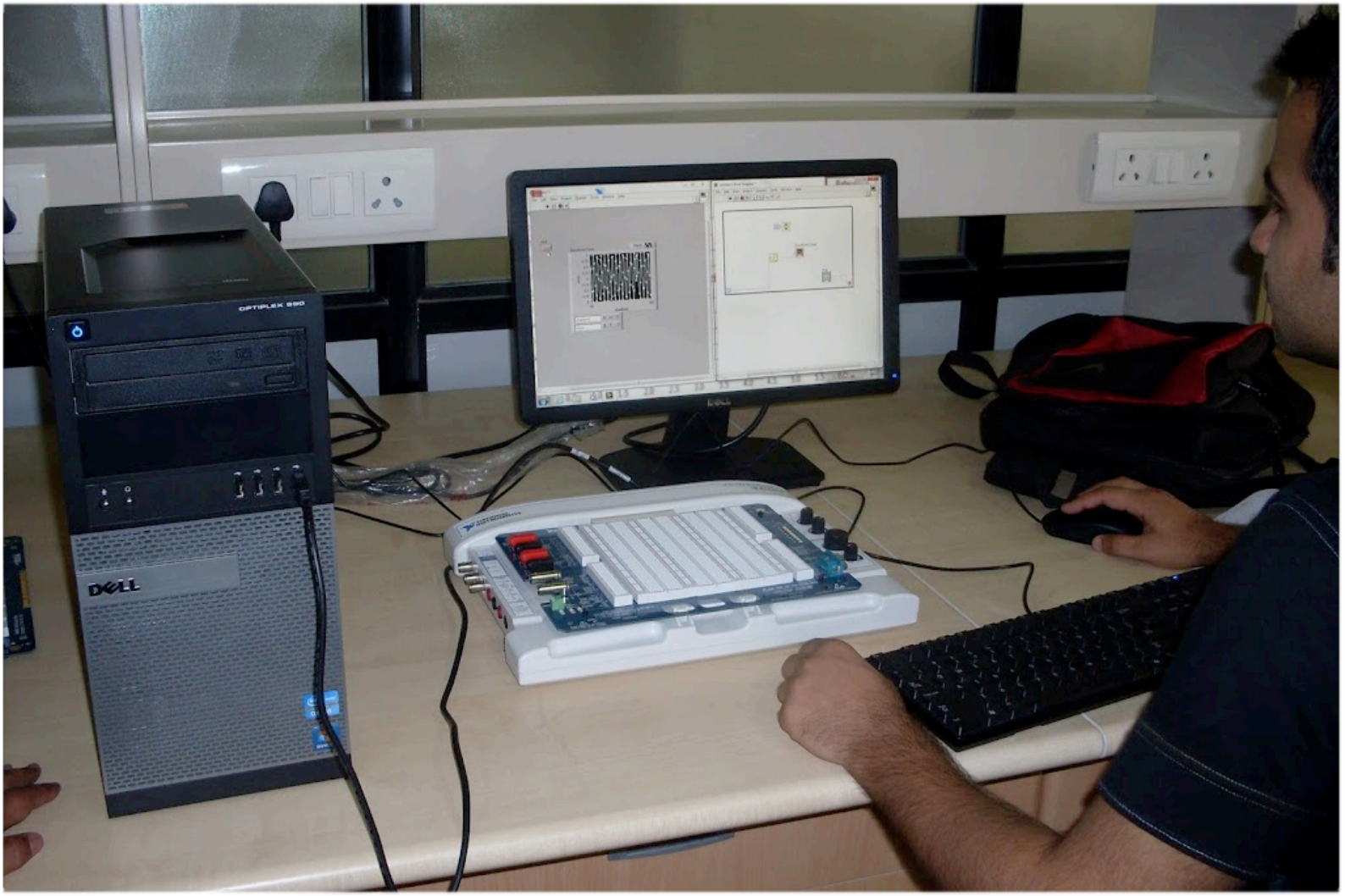
Experimental:

1) Dual ion beam sputtering deposition (DIBSD) system from Elettrorava spa used to deposit:
Inorganic oxides/nitrides/dielectrics (SiO_2, TiO_2, Si_3N_4, ZrO_2, ITO, FTO, IZO etc.);
Metals (Au, Ti, Al, Pt etc.);Semiconductors (ZnO, Ge, GaN, PbTe, Si etc.)
-High quality growth at room/high temperature (~1000 ^{0}C) and under UHV is possible.



DIBSD System.





NI ELVIS CONTROL SYSTEM

3) Spin Coater (APEX Model SCU 2008C):It is a single wafer system with a permanent EEPROM storage of programs to store multiple programs. It has the feature of vacuum substrate hold-down interlock with adjustable set point

4) De-ionized Water (Elix-10 from Millipore):Remove particulates > 0.5 um, ions, organics and bacteria, Conductivity upto 1 uS/cm, Flow-rate is 10 L/hr, Storage reservoir of 100 L capacity.

Test and Measuring Instruments:

1) LCR meter from Hioki (Hioki 3532):To measure: **|Z|,|Y|, θ, Rp, Rs(ESR), G, X, B, Cp, Cs, Lp, Ls, D(tan δ), Q,** Source frequency: 42 Hz to 5 MHz (0.1 Hz to 1 KHz steps).

2) Dual-channel System Source Meter (Kethley Model 2612A): To measure: I-V functional test and characterization of a wide range of devices such as BJT, FET, LED, VCSEL, Analog IC, RFIC etc.

In Process:
1. Photoluminescence Measurement set-up
2. Four-probe Hall Measurement set-up
3. Potentiostat-Galvanostat

Computational Tools:

- SILVACO TCAD Package (device simulator, 2D and 3D simulation on MOSFET, BJT, OFET, LED, Quantum well, Laser, Solar Cell, TFT, OTFT, OLED etc.)

- Details of teaching labs:

1. Currently total nine undergraduate teaching lab courses for all four years are offered.
2. All the labs are equipped or getting equipped with the state of the art measuring and testing instruments and the experiments designed for these labs are contemporary.
3. The labs are equipped with major test and measurement instruments like Digital Oscilloscopes, Analog Oscilloscopes, Function Generators, DC power supplies.
4. The images below show one of the electrical engineering labs. Like this, there are total three labs. The lab courses which are running in these labs are Basic Electrical and

Electronics Engineering Lab, Electronic Devices Lab, Analog Circuits Lab, Digital Systems Lab and Microprocessors Lab.

5. The labs under development stage are communication lab, electrical machines and power electronics lab, control systems lab and digital design lab.

DIGITAL SYSTEM DESIGN





Electric Machines and Power Electronics Lab: Study of Solar PV Pane

DISCIPLINE OF MECHANICAL ENGINEERING





CNC EDM AND CNC WIRE EDM

FACULTY AND RESEARCH



Dr Anand Parey

Condition Monitoring
Noise and Vibration Isolation
Signal Processing of Mechanical Systems

Refrigeration and Air conditioning



Dr Anil Kumar Emadabathuni

Solid State Storage of Hydrogen,
Thermodynamic properties of
Metal Hydrides
Metal Hydride based Engg Devices



Dr Bhupesh K Lad

Industrial Engg, Reliability Engg
Operations Planning and Control



Dr Devendra Deshmukh

Internal Combustion Engines
BioFuels
Modeling IC Engine Processes



Dr I. A. Palani

Laser Assisted Micro-Processing
Surface Engineering
Opto-Mechatronics
Synthesization of Nano Structures



Dr Kazi Sabiruddin

Thermally Sprayed Coatings



Dr M. Santhakumar

Robotics and Control
Non-Linear Control and Filter Design
Dynamic Modeling and Analysis
Ocean Robotic and Sensory Systems
Medical Assistive Devices



Dr Neelesh Kumar Jain

Advanced and Hybrid Machining Processes
Micro-machining and Nano finishing Processes
CAPP, CAD/CAM
Application of Soft Computing Techniques
Product Data Management (PDM)



Dr Ritunesh Kumar

Desicant Air-conditioning Systems
Heat transfer
Biogas, Microbial Fuel cell



Dr S. Dhinakaran

Fluid Dynamics and Heat Transfer
Bio Fluid Mechanics
Heat Pipes, Non-Newtonian Fluid Mechanics



Dr Santosh K Sahu

Thermal Engineering
Thermal Hydraulics
Experimental Thermo-Fluid Science



Dr S.C. Koria

Energy Efficiency in Industrial Furnaces
Steel Making
Continuous Casting
Heat and Mass Transfer in Metallurgical Reactors



Dr Satyajit Chatterjee

Surface Technology

Discipline of Mechanical Engineering

Mechanical Engineering at IIT Indore was initiated in July 2009. The department currently offers a BTech in Mechanical Engineering and also has research scholars pursuing a PhD in varied areas. The discipline currently has eleven faculty members and this number is expected to grow in the coming years. Between them, the faculty in Mechanical Engineering have a range of expertise and research interests. These include (but are not limited to) Design Engineering, Thermal and Fluid Engineering, and Production and Industrial Engineering. The department has over 14 laboratories associated with various areas of research. The department also houses a central workshop and state-of-the art manufacturing facility.

Faculty:

Currently the discipline has eleven faculty members with a wide range of research interests and focus. The discipline expects to add more faculty members as the number of students and research scholars continue to grow.

Expertise and Research Areas:

1. Advanced and Hybrid Machining Processes, Precision Finishing of Gears, Micro-machining and Nano-finishing Processes, Process Parameters Optimization.

   Faculty members working in the above areas: Dr N. K. Jain

2. Condition Monitoring, Noise and Vibration Isolation and Monitoring, Fault Diagnosis.

   Faculty members working in the above areas: Dr Anand Parey

3. Dessicant Air-conditioning Systems.

   Faculty Members working in the above areas: Dr Ritunesh Kumar

4. Thermal Hydraulics, Two-Phase Flows, Heat Transfer, Quenching Heat transfer.

   Faculty Members working in the above areas: Dr Santosh Kumar Sahu

5. Solid state hydrogen storage-Metal hydrides, Simulation and experimental analysis of metal hydride based engineering devices, Wet and solid absorption cooling. Theoretical and experimental analysis of biomass and solar thermal energy conversion technologies.

   Faculty Members working in the above areas: Dr Anil Kumar.

6. Surface Technology, Resistant Coating with Solid Lubrication.

   Faculty Members working in the above areas: Dr Satyajit Chatterjee.

7. Thermally Sprayed Coatings.
   Faculty members working in the above area: Dr Kazi Sabruddin.

8. Laser Assisted Micro processing, Surface Engineering, Opto-Mechatronics, Synthesization of Nano Structures.

   Faculty Members working in the above areas: Dr I.A. Palani.

9. Reliability Engineering, maintenance management, Engineering asset management, operations management/Operations planning and control.

   Faculty Members Working in the above areas: Dr Bhupesh Lad.

10. Computational Fluid Dynamics and Heat Transfer, Bio-Fluid Mechanics, Bluff Body Blows, Heat Transfer in Porous Media, Non-Newtonian Fluid Mechanics.

    Faculty Members Working in the above areas: Dr S Dhinakaran.

10. Internal Combustion Engines, Bio-Fuels, Spray and Combustion Diagnostics, Modeling I.C.Engine Processes, Computational Fluid Dynamics.

    Faculty Members working in the above areas: Dr Devendra Deshmukh.

SELECTED PUBLICATIONS:

1. J. P. Misra, P. K. Jain, N. K. Jain and H. Singh (2012), "Effects of Electrolyte Composition and Temperature on Precision Finishing of Spur Gears by Pulse Electrochemical Honing (PECH)" Int. J. Precision Technology, 3(1), 37-50. (DOI: 10.1504/12.45987)

2. Pragya Shandilya, P. K. Jain and N. K. Jain (2012) "On Wire Breakage and Microstructure in WEDC of SiCp/6061 Aluminum Metal Matrix Composites", Int J. of Advanced Manufacturing Technology, 2012, (DOI: 10.1007/s00170-012-4095-2)

3. Pragya Shandilya, P. K. Jain and N. K. Jain (2012) “Neural Network based Modeling in Wire Electric Discharge Machining of SiCp/6061 Aluminium Metal Matrix Composite”, Advanced Materials Research, Vol. 383-390, 6679-6683. (DOI:10.4028/www.scientific.net/AMR.383-390.6679)

4. Pragya Shandilya, P. K. Jain, and N. K. Jain (2012) Prediction of Surface Roughness During Wire Electrical Discharge Machining of SiCp/6061 Al MMC, Int. J. of Industrial and Systems Engineering, 12(3), 301-315.

5. Pragya Shandilya, P. K. Jain, and N. K. Jain, (2011), Modelling and Analysis of Average Cutting Speed in WEDM of SiCp/6062 Al Metal Matrix Composite, Manufacturing Technology Today, 10 (4), 18-26.

6. Pragya Shandilya, P. K. Jain, N. K. Jain (2011), Modeling and analysis of surface roughness in WEDC of SiCp/6061 Al MMC through response surface methodology, Int. J. of Engineering Science and Technology, 3(1) 531-535. (http://www.ijest.info/issue.php?file=vol03issue01)

7. Pragya Shandilya, N. K. Jain, and P.K. Jain (2011), "Experimental Studies on Wire Electric Discharge Cutting of SiCp/6061 Aluminium Metal Matrix Composites", Key Engineering Materials, 450 (2011), 173-176. (Publisher: Trans Tech Publications, Switzerland) (DOI: 10.4028/www.scientific.net/KEM.450.173)

8. S.K. Sahu, P.K. Das, and S. Bhattacharyya, "An Experimental Investigation on the Quenching of a Hot Vertical Heater by Water Injection at High Flow Rate", Nuclear Engineering and Design, 240, pp. 1558-1568, 2010.

9. Sahu, S. K., Behera, P., An improved lumped model for transient heat conduction in different geometries, Computational Thermal Science 4 (2012) 39-48.

10. Sahu, S. K., Behera, P., An improved lumped analysis for transient conduction in different geometries with heat generation, Comptes Rendus Mecanique 340 (2012) 477-484 (Invited article)

11. Patil, N. D., Das, P. K., Bhattacharyya, S., Sahu, S.K., An experimental assessment of cooling of a 54-rod bundle by in-bundle injection, Nuclear Engineering and Design, 250(2012)500-511

12. E. Anil Kumar, M. Prakash Maiya and S. Srinivasa Murthy, "Measurement and analysis of effective thermal conductivity of MmNi4.5Al0.5 hydride bed". Industrial and Engineering chemistry research (2011).

13. Satyajit Chatterjee, J. Dutta Majumdar, K. Singaiah, S.M. Shariff, G. Padmanabham, A. Roy Choudhury, Performance evaluation of laser surface alloyed hard nano-structured Al2O3-TiB2-TiN composite coatings with in-situ and ex-situ reinforcements, Surface and Coatings Technology, Volume 205, Issue 11, 2011, p3478.

14. Satyajit Chatterjee, J. Dutta Majumdar, S.M. Shariff, G. Padmanabham, A. Roy Choudhury, Effect of laser post-treatment on Al2O3-TiB2-TiN composite coating with free hBN, The International Journal of Advanced Manufacturing Technology, Volume 61, Numbers 5-8, 2012, p559.

15. M.Santhakumar, (2011) Proportional-derivative observer based backstepping control for an underwater manipulator, Mathematical Problems in Engineering, 2011, 1-18.

16. M.Santhakumar and T.Asokan, (2011) Investigations on the dynamic station keeping of an underactuated autonomous underwater robot. International Journal of Simulation Modelling, 10 (3), 145-157.

17. M.Santhakumar and T.Asokan, (2011) A nonlinear tracking control scheme for an underactuated underwater robotic vehicle. International Journal of Ocean Systems Engineering, 1(3), 120-135.

18. M.Santhakumar and T.Asokan, (2011) A nonlinear tracking control scheme for an underactuated underwater robotic vehicle. International Journal of Aerospace and Mechanical Engineering, 5(3), 178-183.

19. Lad B.K. and Kulkarni M.S., Optimal maintenance policy decisions for machine tool considering users' cost structure, "International Journal of Production Research (IJPR)", DOI:10.1080/00207543.2011.632503, 2011, pp. 1-1

20.S. Hazra, K. Sabiruddin and P. P. Bandyopadhyay, Plasma and HVOF sprayed WC-Co coatings as hard chrome replacement solution, Surface Engineering, Vol. 27, No. 8, 2011

21. Kazi Sabiruddin, P.P. Bandyopadhya, Scratch induced damage in alumina splats deposited on bond coats, Journal of Materials Processing Technology, Volume 211, Issue 4, 1 April 2011, Pages 553-559

22. Kazi Sabiruddin, P. P. Bandyopadhyay, Giovanni Bolelli, Luca Lusvarghi, Variation of splat shape with processing conditions in plasma sprayed alumina coatings, Journal of Materials Processing Technology, Volume 211, Issue 3, 1 March 2011, Pages 450-462

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25. I.A. Palani, D. Nakamura, K. Okazaki, M. Higashihata, T. Okada, Influence of Sb as a catalyst in the growth of ZnO nano wires and nano sheets using Nanoparticle Assisted Pulsed Laser Deposition (NAPLD), Materials Science and Engineering: B, Volume 176, Issue 18, 15 November 2011, Pages 1526-1530.

26. B. Cao; K.Sakai; D, Nakamura; Palani, I. A.; Gong, H. B.; Xu, H. Y.; Higashihata, M; T.Okada “Stimulated Optical Emission from ZnO Nanobelts Grown with a Simple Carbothermal Evaporation Method”, The Journal of Physical Chemistry Vol.115, pp. 1702-1707,2011.01.

27. D. Nakamura, K. Okazaki, I.A. Palani, M. Higashihata, T. Okada ” Influence of Sb on a Controlled-growth of aligned ZnO nanowires in nanoparticle- assisted pulsed-laser deposition” Appl Phys A, DOI 10.1007/s00339-011-6401-5 A (2011) 103:959–963.

28. S.Dhinakaran (2011). Heat transfer from a bluff body near a plane moving wall at Re=100. International Journal of Heat and Mass Transfer, 54 (25-26), 5444-5458.

29. Deshmukh D., Ravikrishna R. V. (2011) Experimental studies on high pressure spray structure of biofuels, Atomization and Sprays, 21 (6): 467–481 (2011)

30. Deshmukh D., Ravikrishna R. V. (2012) Studies on Microscopic structure of diesel sprays under atmospheric and high gas pressures, Fuel, Volume 97, July 2012, Pages 879–883.

31. R. Chandra, H. Takeuchi, T. Hasegawa, R. Kumar "Improving biodegradability and biogas production of wheat straw substrates using sodium hydroxide and hydrothermal pretreatments." Energy, Volume 43, July 2012, Pages 273-282

SELECTED CONFERENCE PROCEEDINGS:

1. Shandilya Pragya, Jain P. K. and Jain N. K. (2012) "Parametric optimization during wire electric discharge machining of SiCp/6061 Al metal matrix composite using response surface methodology", International conference on modelling, optimization and computing" 10-11 April, 2012, Tamilnadu.

2. Shandilya, Pragya, Jain, P. K. and Jain, N. K. (2011) "Surface Integrity Aspects After Wire Electric Discharge Machining of SiCp/6061 Al Metal Matrix Composites". International Conference on Advanced Materials and Manufacturing Processes (ICAMP), IIT Kharagpur, 9-11 December, 2011, Kharagpur, India.

3. Pragya Shandilya, P. K. Jain, and N. K. Jain (2011), "Effect of machining parameters on MRR during wire electric discharge cutting of SiCp/6061 Al MMC", Annals of DAAAM for 2011 & Proceedings of the 21st International DAAAM Symposium Vienna, Austria, 23-26 November 2011, 745-746.

4. Shandilya Pragya, Jain P. K. and Jain N. K. (2011) "Artificial neural network kerf model in Wire Electric Discharge Machining of SiCp/6061 Al MMC". ASME International Mechanical Engineering Congress and Exposition, 11-17 November, Colorado, USA. (Accepted)

5. Shandilya, Pragya, Jain, P. K. and Jain, N. K. (2011) "Neural network based modeling in wire electric discharge machining of SiCp/6061 Aluminum metal matrix composite". Proc. of International Conference on Manufacturing Science and Technology (ICMST), 16-18 September, 2011, Singapore.

6. Shandilya, Pragya, Jain, P. K. and Jain, N. K. (2011) "Selection of optimum parameters in wire electric discharge cutting (WEDC) of SiCp/6061 Al MMC". Proc. of 5th International Conference on Advances in Mechanical Engineering (ICAME), SVNIT, 6-8 June, 2011, Surat, India, 666-670.

7. Y Pandya and A Parey, "Fault detection of a two-stage gearbox with artificially induced gear crack using vibration monitoring", 5th Indian International Conference on Artificial Intelligence, December 14-16, 2011, Tumkur, India.

8. Sahu S K and C. Kumar, Assessment of capability of theoretical correlations for prediction of pressure drop of fuel pins with grid spacers, 9th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, HEFAT 2012, Malta, 2012

9. E. Anil Kumar, Vinod Kumar Sharma, "Thermal conductivity of metal hydride beds". 3rd International conference on advanced Materials, December 13-16, 2011, PSG College of Technology, Coimbatore, India.

10. E. Anil Kumar, Vinod Kumar Sharma, "Characterisation of metal hydrides for hydrogen storage and metal hydride based engineering applications". International conference on Futuristic Trends in Materials & Energy Systems, December 29-30, 2011, VR Siddhartha Engineering College, Vijayawada, India.

11. M. Santhakumar and Jinwhan Kim, A Nonlinear Task space Tracking Control of an Underactuated Underwater Vehicle, The 9th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI 2012), Daejeon, Republic of Korea, Nov, 2012 (to be presented)

12. M. Santhakumar, A nonlinear disturbance observer based adaptive control scheme for an underwater manipulator, International Conference on Intelligent Robotics, Automation and Manufacturing (IRAM 2012), Malaysia, Nov, 2012 (to be presented)

13. M. Santhakumar and Jinwhan Kim, Indirect adaptive control for autonomous underwater vehicle-manipulator systems, The 22nd International Offshore (Ocean) and Polar Engineering (ISOPE 2012) Conference Rhodes, Greece, June 17 to 22, 2012.

14. M.Santhakumar and Jinwhan Kim, Power efficient trajectory tracking control of underactuated autonomous underwater vehicle-manipulator systems, IEEE / MTS OCEANS 2012, Yeosu, ROK, May 2012.

15. M. Santhakumar and Jinwhan Kim, Modelling, simulation and model reference adaptive control of autonomous underwater vehicle-manipulator systems, IEEE International Conference on Control, Automation and Systems (ICCAS 2011), KINTEX, Gyeonggi-do, Korea , Oct. 26-29, 2011.

16. T.W.Simson and M.Santhakumar. Planar dynamic modelling, simulation and planar control of an underwater robot equipped with a planar manipulator. International Conference on Recent Innovations in Technology (ICRIT 2011), Kottayam, India, Feb, 2011.

17. K.P.Sarath, M.Santhakumar and A.P.Sudheer. Dynamic modeling, control and simulation of an industrial manipulator for drilling operation. International Conference on Recent Innovations in Technology (ICRIT 2011), Kottayam, India, Feb, 2011.

18. S. Dhinakaran (2012). Heat transport from a spherical body to flowing nanofluids. IV Nacional Conference on Mechanics of Fluids, Thermodynamics and Energy, Lisbon, PORTUGAL, May 28- 29.

19. Deshmukh D., A. Madan Mohan and R. V. Ravikrishna, Spray Characterization of Pongamia Pure Plant Oil in a High Pressure Chamber, ILASS – Europe 2011, 24th Annual Conference on Liquid Atomization and Spray Systems, Estoril, Portugal, September 2011.

20. A. Madan Mohan , Deshmukh D., T.N.C. Anand, and R.V. Ravikrishna, Air-assisted Impinging Jet Spray Characterization of Pongamia Pure Plant Oil, ILASS – Europe 2011, 24th Annual Conference on Liquid Atomization and Spray Systems, Estoril, Portugal, September 2011.

21. I.A. Palani1, D. Nakamura, K. Okazaki, T. Shimogaki, M. Higashihata, T. Okada, Investigationson ZnO/ZnO:SB-Al co-doped homostructures with nanowires synthesized uisng nano particle assisted pulsed laser deposition(NAPLD).IITM-Japan Symposium on ZnO Nanocrystals and allied materials, January 9-10, 2012, IIT Madras, India.

22. G. Amutha, I. A. Palani, N. J. Vasa, M.Singaperumal, T. Okada, Investigations On Pico-Second Laser Based Annealing And Texturing of Amorphous Silicon Thin Films For Photovoltaic Applications. The 3rd Asian Symposium on Materials and processing, Agust 30-31, 2012, IIT madras, Chennai, India.

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1. R. Kumar, Stand Alone Liquid Desiccant Air-Conditioning Systems, LAP Lambert Academic Publishing, 2011.
2. Shandilya, Pragya; Jain, P. K. & Jain, N. K. (2011). Wire Electric Discharge Machining of Metal Matrix Composite Materials, Chapter 30 in DAAAM International Scientific Book 2011, pp. 383-400, B. Katalinic (Ed.), Published by DAAAM International, ISBN 978-3-901509-84-1, ISSN 1726-9687, Vienna, Austria (DOI: 10.2507/daaam.scibook.2011.30)

CURRENT RESEARCH PROJECTS:

1. Title: Experimental Investigations and Performance Optimization of High-Precision Finishing of Gears by Electro Chemical Honing (ECH) Process Funding Agency: CSIR New Delhi
   Budget and duration: Rs. 18.76 Lacs (Three years from May 2009)
   Project Investigator : Prof. N. K. Jain.

2.Title "Augmentation of effective thermal conductivity of metal hydride beds"
   Budget - Rs 20,00,00
   Funding agency: Department of Science and Technology Project
   Investigator : Dr. E. Anil Kumar

LECTURES AND SEMINARS:

1. Prof. Mafred Groll visited IIT Indore between April 23rd and 29th, 2012. He delivered a series of lectures on the energy related issues. The titles of the talks are as follows
"Energy Supply Options for the 21st Century"

"Energy and Society"

"Hydrogen - Electricity Energy Economy"

"Heat Pipe Science & Technology"

2. Dr. B. N. Mohapatra (General Manager-Quality, Vikram Cement).
"Total Quality Management (TQM) in Cement Industry" April 23, 2012.

Facility and Infrastructure:

Advanced Manufacturing Process Laboratory



CNC TURNING MACHINE

CNC Turning Centre
CNC Milling Centre
CNC Electric Discharge Machining Setup (EDM)

CNC Wire-Electric Discharge Machining Setup (Wire-EDM)
Micro-machining Centre
Rapid Prototyping machine

APPLIED THERMODYNAMICS LABORATORY



AIR CONDITIONING UNIT

Instrument Features:

Bench Top Cooling Tower

Refrigeration Cycle Demonstration Unit
Air Conditioning Laboratory Unit
Rankine Cycler
Gas Turbine
Compression-Ignition Engine
Spark-Ignition Engine

Computer Aided Design Laboratory





CENTRAL WORKSHOP

Sections of the Central Workshop

Fitting Section
Foundry Section
Carpentry and Welding Sections
Plastic Parts and Machine Tools Manufacturing Section

EXPERIMENTAL ENGINEERING LABORATORY

Instrument Features

Pressure Measurement Set up

Temperature Measurement Set up

Mechatronic Sensor Board

Vibration Fundamental Trainer

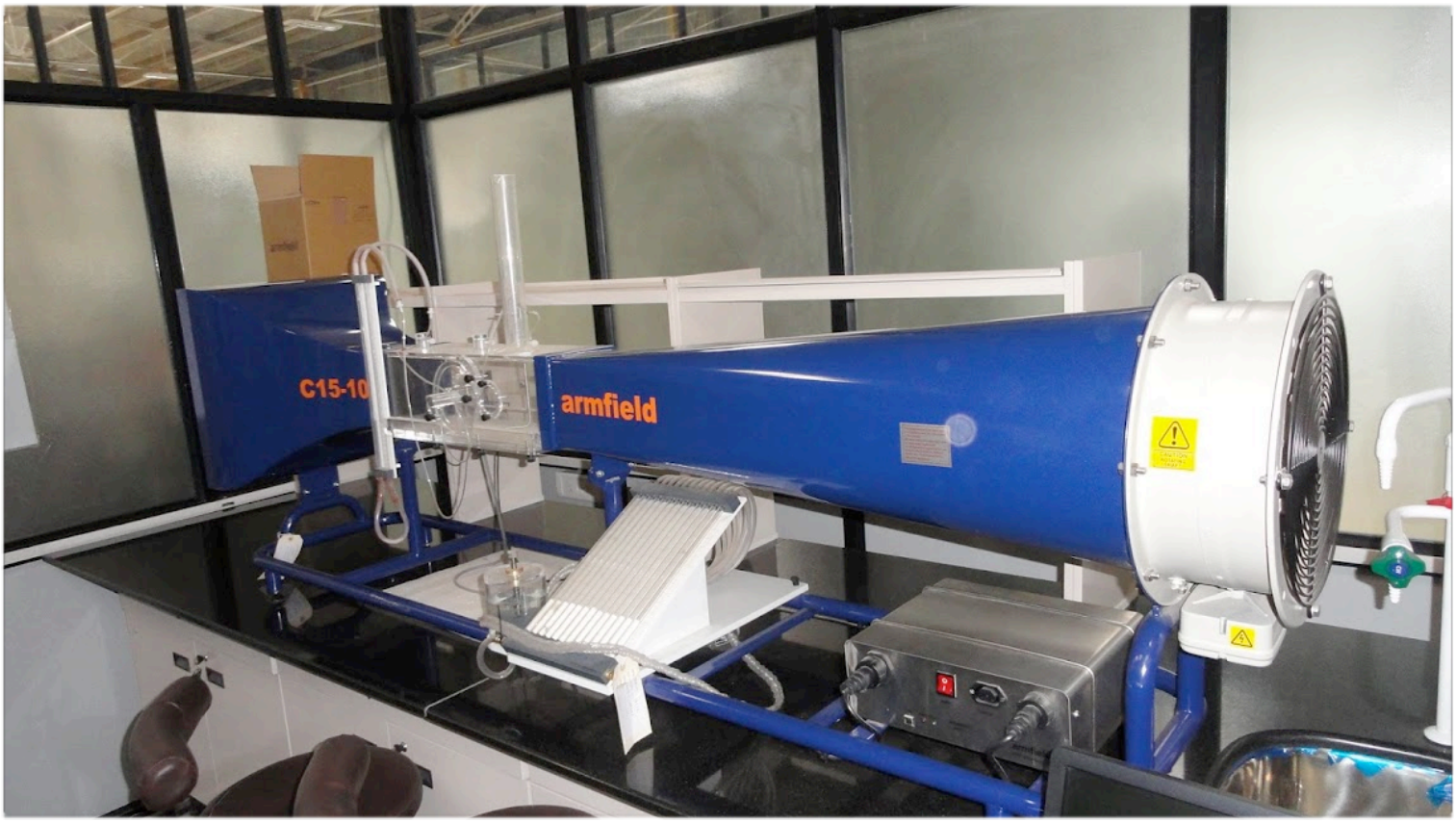
Maxwell Bridge Trainer

Kelvin Bridge Trainer



CI ENGINE

FLUID MECHANICS AND MACHINERY LABORATORY



AIR WIND TUNNEL

Instrument Features

Air Wind Tunnel

Flow Meter Trainer

Fluid Friction Apparatus

Centrifugal Pump Test rig

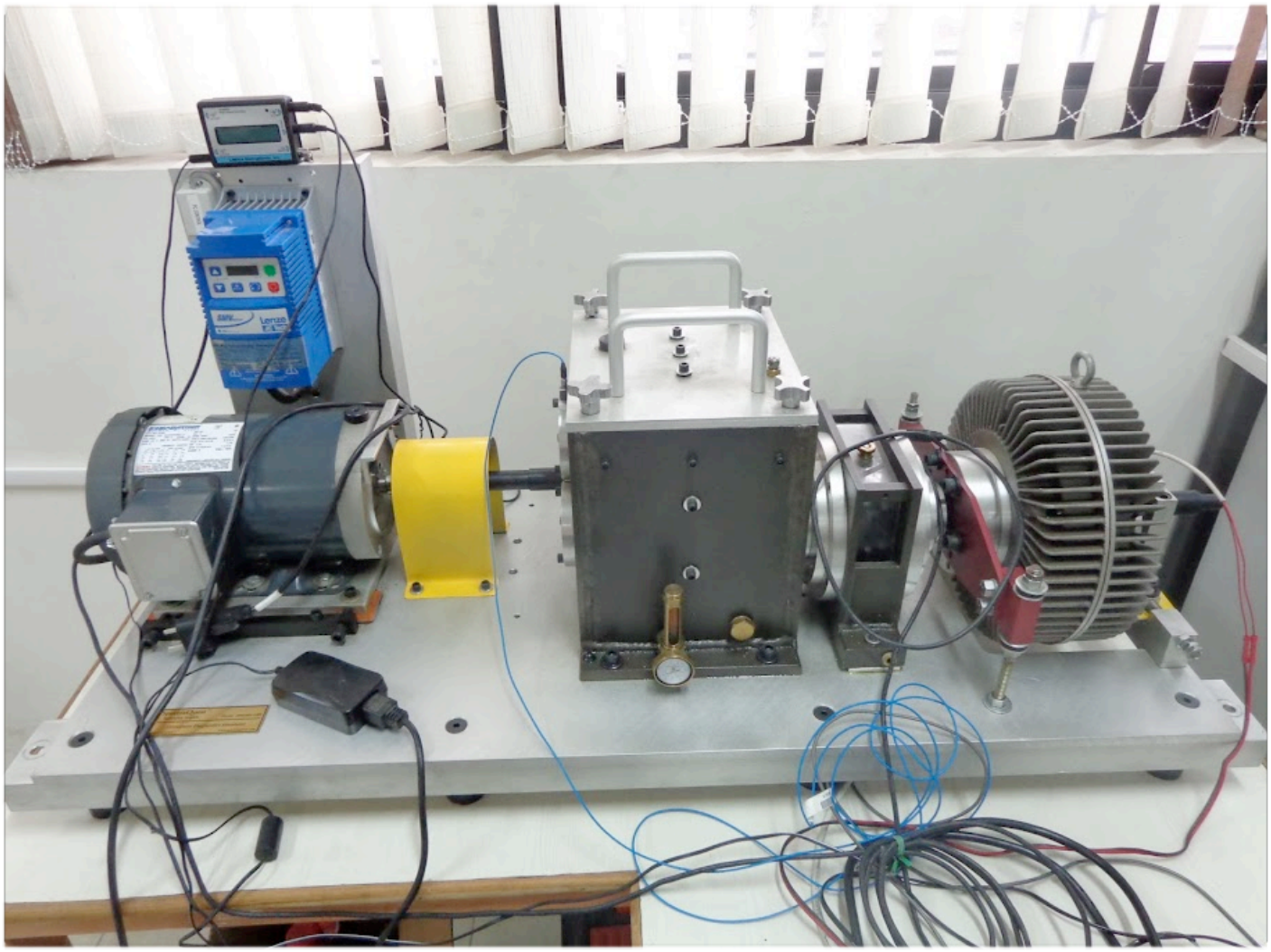
Pelton Wheel Turbine Test rig

Kaplan Turbine Test rig

FRANCIS TURBINE TEST RIG



GEAR RESEARCH LABORATORY



GEAR FAULT AND DIAGNOSTIC CENTER

Gear Research Laboratory works as an extension of Metrology Laboratory at IIT Indore with instruments dedicated to Gear Research. Work Done in the lab are classified as:

Precision Finishing of Gears
Correction of Shape Related Errors
Operating Performance Optimization of Gears
Minimization of the Gear Wear
Fault Diagnosis
Reliability Issues

Instrument Features:

Upright Optical Miscroscope
Optical Surface Profiler System
CNC Coordinate Measuring Machine (CMM)
Gear Metrology Machine
CNC Gear Metrology Machine

HEAT TRANSFER LABORATORY

Heat Transfer Laboratory at IIT Indore is equipped to observe the physical mechanisms of heat transfer modes. Performance of different types of heat exchangers can also be evaluated.

Instrument Features

Flow Boiling Demonstration Unit

Condensation unit
Heat Exchanger Unit
Thermal Conductivity of Building Materials

Thermal Radiation Unit



HEAT TRANSFER LAB

Heat Conduction in Gases & Liquid
Linear Heat Conduction Unit
Radial Heat Conduction Unit
Heat Transfer in Extended Surfaces
Free and Forced Convection Unit
Experimental set up for characterization metal hydrides



HEAT TRANSFER LAB

KINEMATICS AND DYNAMICS LABORATORY

This laboratory introduces the student of Mechanical Engineering to the motion and interaction of machine elements, as well as forces acting on machines and mechanisms related to scientific or fundamental research related to machine design.

List of Equipments / Facilities

Mechanism Development Kit

Universal Vibration Analyzer

Multi body Dynamics and Motion Analysis Software (ADAMS)

Static and Dynamic Balancing Apparatus

Universal Governor and Motorized Gyroscope Arrangements

Various Frictional Elements

MECHATRONICS AND INSTRUMENTATION LABORATORY

Mechatronics and Instrumentation laboratory provides an interdisciplinary base in bridging electronics with mechanical systems. This laboratory will provide an opportunity for the students to explore the different electromechanical systems and their components such as sensors transducers and instrumentations, electrical and mechanical actuators, microprocessor based systems, precision measurements using Opto-mechatronics based systems for interfacing and control of mechanical systems

Transducer Kit

Displacement measurement with electro-mechanical transducers
Temperatures gradient measurement with Heat Transducers

Process control trainer

Heating Element controlled by thyristor circuits

Michelson's Interferometer

Calibration of Slip gauge

Wavelength Measurement of monochromatic light

Optical Instrumentation

Characteristics of LDR

Measurement of Groove Spacing in a CD

METALLOGRAPHY AND TRI BIOLOGY LABORATORY

The Metallography and Tribology Laboratory has been conceptualized as the starting block of material research in terms of sample preparation and finding out the mechanical and tribological properties of material. The Metallography section of this laboratory is a facility to prepare specimens capable of revealing the true microstructure of materials submitted for study. The laboratory would be capable to perform simple microscopic evaluations, linear measurements, and other related tests. To provide the services required, a metallography section has been knowledgeably organized, adequately equipped and competently staffed.

The Tribology section of this Laboratory has the instruments to measure the tribological properties of materials. The purpose of this laboratory is to evaluate and quantify friction, wear and lubrication properties and to learn about the counter body interactions of materials.

Instrument Features:

Polishing Machine
Hot Mounting Press
High Speed Cut off Machine
Slow Speed Sectioning Machine
Inverted Metallurgical Microscope
Precision Balance
Analytical Balance
Fretting Wear Tribometer

METROLOGY LABORATORY

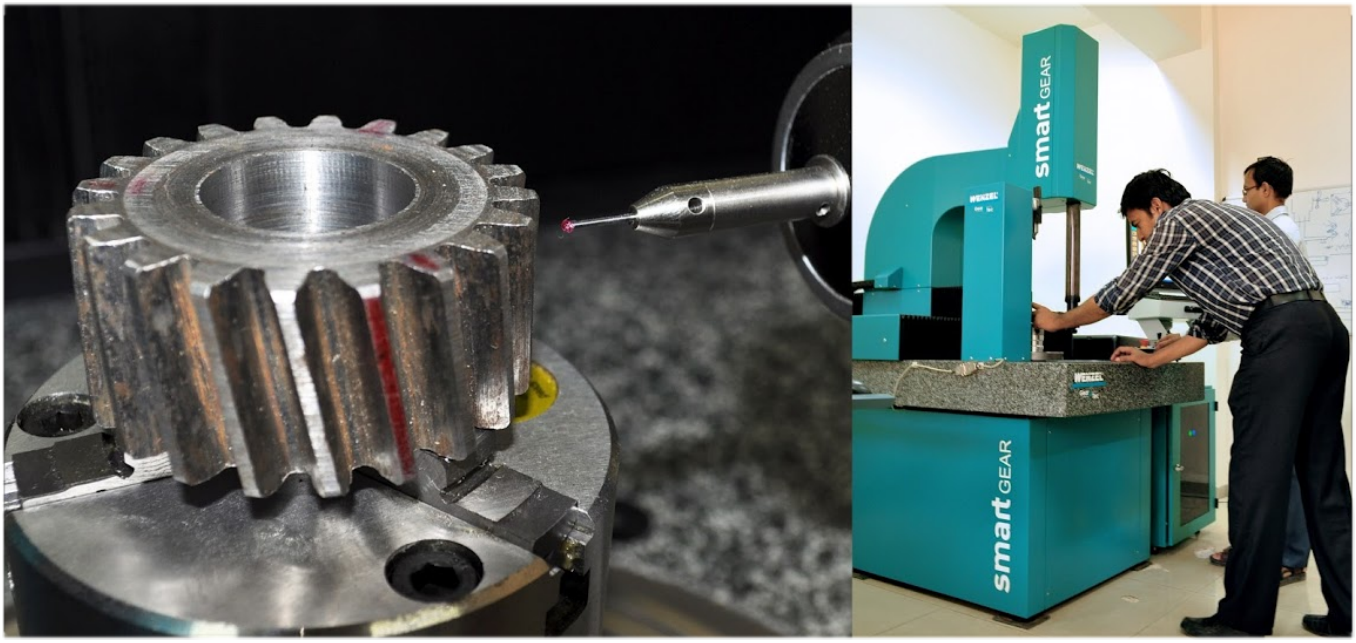
Metrology laboratory of IIT Indore is a very important part of the education and research efforts in different areas of Engineering with state of the art measuring Instruments. The facilities are equipped to support activities related to scientific or fundamental metrology, applied or industrial metrology and legal metrology

INSTRUMENT FEATURES

Form/Shape Measuring System
Toolmaker's Microscope
Surface Roughness Measuring Device
Measuring Calipers and Micrometers (Analog and Digital)



SOLID
MECHANICS
IMPACT
TESTER
COORDINATE

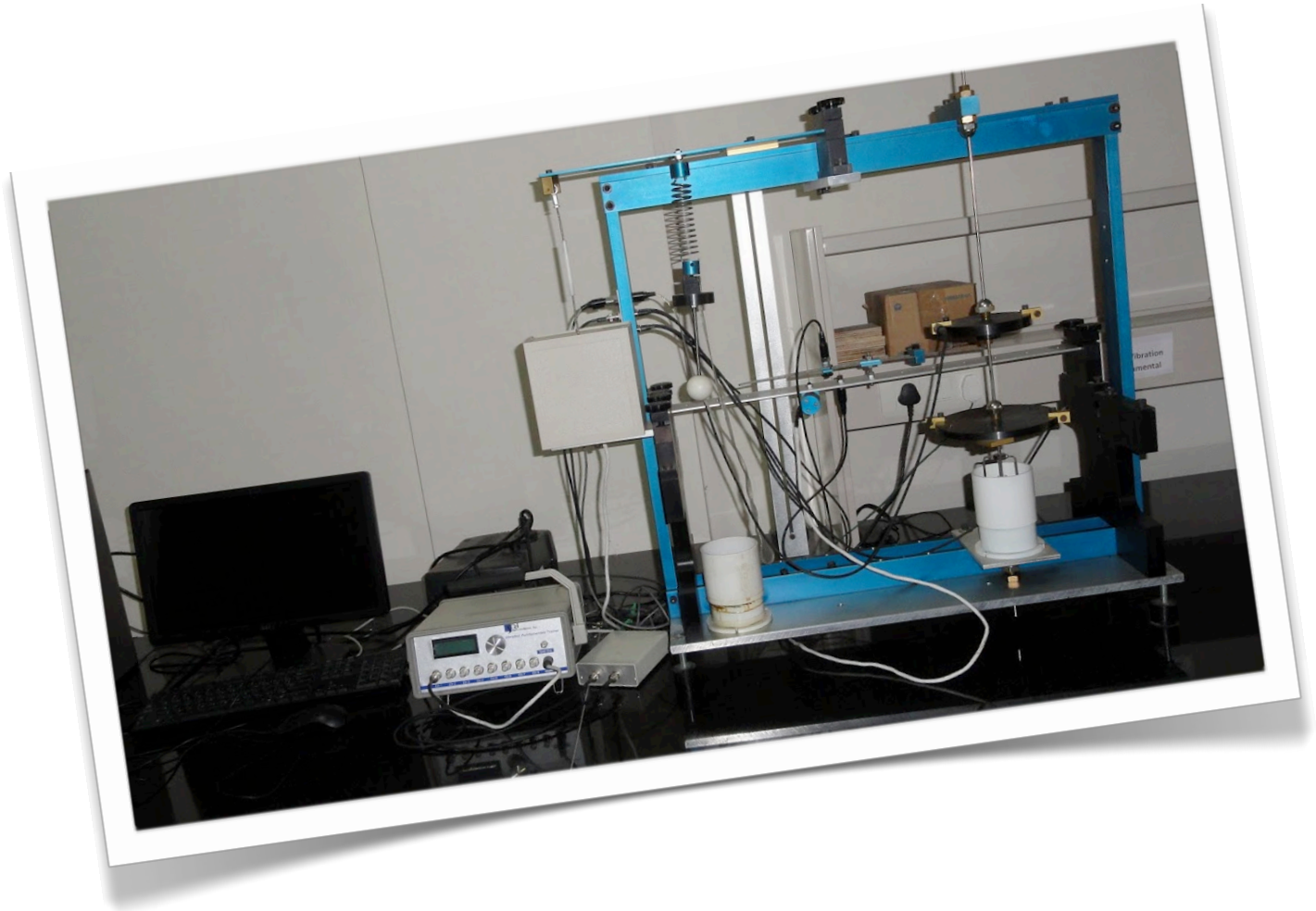


MEASUREMENT MACHINE: GEAR METROLOGY LAB



UNIVERSAL TENSILE TESTER: SOLID MECHANICS LAB

VIBRATION FUNDAMENTAL TRAINER





UNIVERSAL
HARDNESS TESTER

DISCIPLINE OF COMPUTER SCIENCE ENGINEERING




Catalyst 3750G
Catalyst 3750G
Catalyst 2960-S
Catalyst 2960-S
Catalyst 2960-S
DELL
beetel
IN USE

SERVER 2

FACULTY AND RESEARCH



Dr Abhishek Shrivastava

Service Oriented Systems
Dynamic Systems
Agile Techniques
Software-as-a-service



Dr Aruna Tiwari

Soft Computing Techniques
Neural Network Learning Algorithms



Dr Mona Lisa Sarma
Biometric Based Network Security
Cloud Computing



Dr Narendra Chaudhari

Algorithms, Soft Computing
Network Security and Protocols

Theoretical Computer Science

Computer Science and Engineering

Computer Science and Engineering discipline was initiated at IIT, Indore in July 2009. The department currently offers BTech in Computer Science and has research scholars pursuing a PhD in varied areas. The faculty strength in the Computer Science discipline is five and is expected to expand in the coming years. However, the wide range of research interests and projects of different faculty members ensure that students are exposed to the latest research and developments in the field. These include (but are not limited to) Cloud computing, Computational intelligence, Information security, Neural network Learning Algorithms, Software quality assurance and others. The first batch of students with a BTech in Computer Science will graduate in 2013.

Faculty:

Currently the discipline has five faculty members with a wide range of research interests. The discipline is looking to recruit exceptional faculty members to add to the existing group to make it more diverse and cutting edge in the coming years.

Expertise and Research Areas:

1. Algorithms, Theoretical computer science, Soft Computing, Artificial Intelligence (AI).

Faculty members working in the above areas: Dr N.S. Chaudhari.

2. Biometric Network Security, Model based Software Testing, Cloud Computing.

Faculty members working in the above areas: Dr Monalisa Sharma.

3. Soft Computing Techniques and Neural Network Learning Algorithms.

Faculty members working in the above areas: Dr Aruna Tiwari.

4. Service Oriented systems, Dynamic Systems, Geographically Distributed Development Environments, Agile Techniques and Software-as-Service.

Faculty members working in the above areas: Dr Abhishek Shrivastava.

5. Security related aspects in sensor networks, Key Management, Access control, Combinatorics, Design Theory, Cloud Security, Security and Reliability in Smart Grids, Cryptology, Applications and Vehicular Networks.

Faculty members working in the above areas: Dr Sushmita Ruj.

SELECTED PUBLICATIONS:

1. Shukai Li, Ivor W. Tsang and Narendra S. Chaudhari, "Relevance Vector Machine based ensemble learning for Credit Risk Analysis," *Expert Systems with Applications* (ISI 5-year impact factor: 2.193), Vol. 39 (5), pp. 4947-4953 (2012).

2. Shukai Li, Ivor W. Tsang and Narendra S. Chaudhari, "Relevance Vector Machine based ensemble learning for Credit Risk Analysis", Expert Systems with Applications (ISI 5-year impact factor: 2.193), Vol. 39 (5), pp. 4947-4953 (2012).

3. Manoj Kumar Sharma, Pradipta Kumar Saha, Sayan Sarcar, Soumalya Ghosh, Debasis Samanta, Monalisa Sarma, Error Quantifying Metrics for Text Entry Systems Augmented with Word Prediction, The 10th Asia pacific Conference on Computer Human Intercation (APCHI 2012), Matsue, Japan, 28-31 August, 2012 (in press).

4. Sayan Sarcar, Debasis Samanta, Soumalya Ghosh, Monalisa Sarma, Indic Onscreen Keyboard for Text Entry in Bengali, The 10th Asia pacific Conference on Computer Human Intercation (APCHI 2012), Matsue, Japan, 28-31 August, 2012 (in press).

5. Abhishek Srivastava, and Paul G. Sorenson. Service Reliability Assessment in a Composition Environment. Lecture Notes in Business Information Processing, Springer-Verlag, Volume 75, pp. 30-45, 2011.

6. Santa Maity, Debasis Samanta, Satya Ranjan Das, Monalisa Sarma, Language Independent Icon-Based Interface for Accessing Internet, in ACM Proceedings First International Conference on Advances in Computing and Communications (ACC 2011), 22-24 July, 2011 Kochi, Kerala, India.

7. Neetesh Saxena and Narendra S. Chaudhari, "An Approach for SMS Security using Authentication Functions", *International Journal of Computer Applications* (IJCA), IJCA

Special Issue on Communication Security, ISBN: 973-93-80864-65-2, published by Foundation of Computer Science, New York, USA, March 2012.

8. Prakash C. Sharma,Narendra S Chaudhari, "A New Reduction from 3-SAT to Graph *K*-Colorability for Frequency Assignment Problem", Special Issue of *International Journal of Computer Applications* (IJCA) on Optimization and On-chip Communication, No.5. Feb 2012, pp 23-27.

9. Rajkumar Jain, Narendra S Chaudhari, "A New Bit Wise Technique for 3-Partitioning Algorithm", Special Issue of *International Journal of Computer Application*s (IJCA) on *Optimization and On-chip Communication*, No.1. Feb 2012, pp 1-5.

10. Prakash Chandra Sharma, and Narendra S. Chaudhari, " Narendra S. Chaudhari, and Jaya Thomas, "Hybrid Cryptosystem Based on 2-SAT & 3-SAT and the Implications of Polynomial Solvability of 3-SAT", . In, *International Journal of Computer Applications* (IJCA): Special Issue on *Evolution in Networks and Computer Communications*, Vol. 2011, No. 2, pp.:01-06, New York, USA (Oct. 2011, issue published in Dec 2011) (web-link: http://www.ijcaonline.org/specialissues/encc/number2/3720-encc009).

11. Rajkumar Jain and Narendra S. Chaudhari, "Representation of *k*-Cluster constraint as *k*-SAT in Social Networking", In, *International Journal of Computer Applications* (IJCA): Special Issue on *Evolution in Networks and Computer Communications*, Vol. 2011, No.1, pp.:13-18, New York (USA) (Oct. 2011, issue published in Dec 2011) (web-link: http://www.ijcaonline.org/specialissues/encc/number1/3714-encc003).

12. Neetesh Saxena and Narendra S. Chaudhari, "A Secure Digital Signature Approach for SMS Security", In, *International Journal of Computer Applications* (IJCA): Special issue on *IP Multimedia Communications*, Vol. 2011, No.1, pp.:98-102, New York (USA) (Oct. 2011, issue published in Dec 2011) (web-link: http://www.ijcaonline.org/special issues/ipmc/number1/3758-ipmc022).

13. Prakash C Sharma and Narendra S Chaudhari, "Polynomial 3-SAT Encoding for K-Colorability of Graph," In, *International Journal of Computer Applications* (IJCA): Special Issue on *Evolution in Networks and Computer Communications*, Vol.2011, No. 1, pp.:19-24, New York, USA (Oct. 2011, issue published in Dec 2011) (web-link: http://www.ijcaonline.org/specialissues/encc/number1/3715-encc004).

14. Kshitij Pathak, Aruna Tiwari and Narendra S Chaudhari. "Computational Complexity of Association Rule Hiding Algorithms", In, *International Journal of Computer Applications*

(IJCA): Special Issue on *Evolution in Networks and Computer Communications*, Vol.2011, No. 1, pp.:39-43, New York, USA (Oct. 2011, issue published in Dec 2011) (web-link: http://www.ijcaonline.org/specialissues/ encc/number1/3718-encc007)

BOOK CHAPTERS

1. Abhishek Srivastava, and Paul G. Sorenson. Service Selection Using the Customer Preferences of Non-functional Attributes. Handbook of Research on Non-functional Properties for Service Oriented Systems: Future Directions, IGI Global, 2011, pp. 279-296.

2. Neha Bharill, and Aruna Tiwari. "Multi-class Classification using an Improved Multiobjective Simultaneous Learning Framework", e-book: Advances in Intelligent and Soft Computing, Volume 131, 2012, DOI: 10.1007/978-81-322-0491-6, pp 821-831, Proceedings of the International Conference on Soft Computing for Problem Solving (SocProS 2011) December 20-22,2011,Volume 2, IIT Roorkee, India.

REFEREED CONFERENCE PROCEEDINGS

1. Monalisa Sarma, P. V. R. Murthy, Sylvia Jell, Andreas Ulrich, Model-Based Testing in Industry: A Case Study with Two MBT Tools, in ACM Proceedings of 28th International Conference on Software Engineering (ICSE), May 7-9, 2011, Cape Town, South Africa.

2. Aruna Tiwari, Veena Trivedi, "Estimating similarity of XML Schemas using path similarity measure", 3rd Global Congress on Intelligent Systems (GCIS 2012), 6 - 8 November 2012, Wuhan University of Technology, Wuhan, China. (Accepted)

3. Poorva Agrawal, "On Construction of Binary Higher Order Neural Networks and Realization of Boolean functions", International Journal of Computer Applications and Information Technology (IJCAIT), August 2012 (Accepted).

4. Megha Dawar and Aruna Tiwari, "Fast Fuzzy Feature Clustering for Text Classification," International Conference of Advanced Computer Science & Information Technology (ACSI), CS & IT 06, pp. 167–172, July 15, 2012, Chennai, India.

5. Sachin Bhandari, Aruna Tiwari, "Design and Implementation of Binary Neural Network Learning with Fuzzy Clustering", International workshop of Information Technology, Control and Automation (ITCA-2012), July 15, 2012, pp. 349–356, Chennai, India.

6. Anuradha Purohit, Arpit Bhardwaj, Aruna Tiwari, Narendra S. Chaudhari, "Handling The Problem of Code Bloating To Enhance The Performance of Classifier Designed Using Genetic Programming", 5th Indian International Conference on Artificial Intelligence (IICAI-11), 14-16 December 2011, Tumkur.

7. Neha Bharill, Aruna Tiwari "An Improved Multiobjective Simultaneous Learning Framework for Designing a Classifier" IEEE-International Conference on Recent Trends in Information Technology, ICRTIT 2011 MIT, Anna University, Chennai, IEEE catalog no:CFP1122P-CDR, ISBN No: 978-1-4577-0589-2, June 3-5, 2011.

8. Anuradha Purohit, Arpit Bhardwaj, Aruna Tiwari, Narendra S. Chaudhari, "Removing Code Bloating in Crossover Operation in Genetic Programming", International Conference on Recent Trends in Information Technology (ICRTIT-11), June 03-05 2011, pp. 77.

9. Kshitij Pathak, Narendra S Chaudhari and Aruna Tiwari. Article: Privacy-Preserving Data Sharing Using Data Reconstruction Based Approach. IJCA Special Issue on Communication Security comnetcs(1):64-68, March 2012. Published by Foundation of Computer Science, New York, USA.

10. Kshitij Pathak, Aruna Tiwari and Narendra S Chaudhari, "Computational Complexity of Association Rule Hiding Algorithms", IJCA Special Issue on Evolution in Networks and Computer Communications (1):39-43, 2011. Published by Foundation of Computer Science, New York, USA. (OCT 2011)

11. Kshitij Pathak, Aruna Tiwari, Narendra S Chaudhari, " A Reduction of 3-SAT problem from optimal sanitization in association rule hiding", In: Proc. of IEEE Int'l conference ETNCC, 2011, 43-46 IEEE-Xplore ISSN No. 18690.

12. Kshitij Pathak, Narendra S Chaudhari and Aruna Tiwari, "Privacy Preserving Association Rule Mining by Introducing Concept of Impact Factor", In: Proc. of IEEE Int'l conference ICIEA 2012 Singapore.

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14. Ashish Jain, and Narendra Chaudhari, "Genetic Algorithm for Optimizing Network Load Balance in MPLS Network," (Accepted as Regular Paper for oral presentation in:) IEEE International Conference on Computational Intelligence and Communication Networks (CICN-2012), GLS University, Mathura (Nov. 03-05, 2012).

15. Ravindra Kumar Singh, Narendra Chaudhari, and Kanak Saxena, "Integrated Load Balancing Approach for Fault Tolerance in MPLS Networks," (Accepted as Regular Paper for oral presentation in:) IEEE International Conference on Computational Intelligence and Communication Networks (CICN-2012), GLS University, Mathura (Nov. 03-05, 2012).

16. Rekha Saha, Rakesh Kumar Sahu and Narendra S Chaudhari, and Narendra Chaudhari, "Fault Tolerant Reliable Multipath Routing Protocol for Ad hoc Network," (Accepted as Regular Paper for oral presentation in:) IEEE International Conference on Computational Intelligence and Communication Networks (CICN-2012), GLS University, Mathura (Nov. 03-05, 2012).

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21. Neetesh Saxena & Narendra S Chaudhari, "A Secure Approach for SMS in GSM Network", Accepted in CUBE 2012: *International Information Technology Conference & Exhibition*: IT – Engineering – Management - Telecom : India's largest and most comprehensive Information Technology Event, Management Development Centre **(**MDC**)** at Yashwantrao Chavan Academy of Development Administration (YASHADA), Pune, India (3rd -5th Sep 2012).

22. Neetesh Saxena, Narendra S. Chaudhari and G.L. Prajapati, "An Extended Approach for SMS Security using Authentication Functions", *In,* Proceedings of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012), pp. 650-655, IEEE Catalog no. CFP1220A-CDR (published by IEEE, ISBN: 978-1-4577-2117-5) Singapore, 18th -20th July 2012.

23. Narendra Chaudhari, and G.L. Prajapati, "Learning Alignment Profiles for Structural Similarity Measure," *In,* Proceedings of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012), pp. 1316-1321, IEEE Catalog no. CFP1220A-CDR (published by IEEE, ISBN: 978-1-4577-2117-5) Singapore, 18th -20th July 2012.

24. Jaya Thomas, Narendra Chaudhari, "Placement Strategy for Trim Minimization in One-Dimensional Cutting Stock," *In,* Proceedings of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012), pp. 1362-1365, IEEE Catalog no. CFP1220A-CDR (published by IEEE, ISBN: 978-1-4577-2117-5) Singapore, 18th -20th July 2012.
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26. Prakash C. Sharma and Narendra S Chaudhari, "Channel Assignment Problem in Cellular Network and Its Reduction to Satisfiability using Graph k-Colorability", *In,* Proceedings of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012), pp. 1731-1734, IEEE Catalog no. CFP1220A-CDR (published by IEEE, ISBN: 978-1-4577-2117-5) Singapore, 18th -20th July 2012.

27. Rajkumar Jain and Narendra S Chaudhari, "A New 3-Clustering Algorithm For Minimum Sum Of Diameter Using Bit Representation", *In,* Proceedings of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012), pp. 1995-2000, IEEE Catalog no. CFP1220A-CDR (published by IEEE, ISBN: 978-1-4577-2117-5) Singapore, 18th -20th July 2012.

28. Neetesh Saxena and Narendra Chaudhari, "Secure EGDH Scheme for Message Integrity in Wireless Network," *The Third International Conference on Communications Security and Information Assurance* (CSIA- 2012), Delhi, India, (May 25 to 27, 2012) (proceedings of the conference is in the form of Book as: Advances in Intelligent and Soft-Computing, Vol. 4240, ISSN 1867-5662, Springer Verlag, Berlin).

29. Ramesh Thakur, Suresh Jain, and Narendra S Chaudhari, "User Behavior Analysis using Alignment Based Grammatical Inference from Web Server Access Log," *4th International Conference on Electronics Computer Technology* (ICECT 2012), April 6 - 8, 2012, Kanyakumari, India.

30. Neetesh Saxena and Narendra Chaudhari, "Analysis of El-Gamal with Diffie-Hellman Scheme using Hash-Function for Message Security," In, *Proceedings of the 2012 Students Conference on Engineering and Systems* (SCES 2012) Motilal Nehru National Institute of Technology (MNNIT), Allahabad, India, pp. 55-60, ©2012 IEEE, ISBN: 978-1-4673-0454-2, 978-1-4673-0455-9/12/$31.00 (March 16-18, 2012).

31. Neetesh Saxena, Narendra S. Chaudhari, "Message Security in Wireless Networks: Infrastructure based vs. Infrastructureless Networks", *In, Proceedings of the 2012 Students Conference on Engineering and Systems* (SCES 2012), Nehru National Institute of Technology (MNNIT), Allahabad, India, pp. 915-920, ©2012 IEEE, ISBN: 978-1-4673-0454-2, 978-1-4673-0455-9/12/$31.00 (March 16-18, 2012).

32. Ramesh Thakur, Narendra S. Chaudhari, Suresh Jain, and R. Singhai, "Information extraction from semi-structured and un-structured documents using probabilistic context free grammar inference," In, Proceedings, International Conference on Information Retrieval and Knowledge Management (CAMP 2012), (IEEE Conference) Page(s): 273 – 276, Digital

Object Identifier: 10.1109/InfRKM.2012.6204988 MINES Wellness Hotel, Kuala Lumpur, Malaysia (13-15 March, 2012).

33. Ramesh Thakur, Suresh Jain, and Narendra S. Chaudhari, "Grammatical Search for information extraction on Web," *2nd International Conference on Computer, Communication, Control and Information Technology*, C3IT-2012 (Feb. 25-26, 2012), Chennai, India (Proceedings published by ELSEVIER, and available online at available online at www.sciencedirect.com).
34. Ramesh Thakur, Suresh Jain, and Narendra S. Chaudhari, "Incremental Discovery of Sequential Pattern from Semi-Structured Document Using Grammatical Inference", In, Proceedings, *8th International Conference on Distributed Computing and Internet Technology* (ICDCIT 2012), Bhuvenashwar, 01-02 February, 2012, Proceedings of the conference published as: volume 7154, Lecture Notes in Computer Science, Springer Verlag, Berlin (2012) page no 269.

35. Shukai Li, Ivor W. Tsang, and Narendra S. Chaudhari, "Infinite Decision Agent Ensemble Learning System for Credit Risk Analysis," In, Proceedings, The tenth International Conference on Machine Learning and Applications (ICMLA'11), Hilton Hawaiian Village, Honolulu Hawaii USA © 2011 IEEE DOI 10.1109/ICMLA.2011.80, pp, 36-39, (December 18-21, 2011).

36. Narendra S. Chaudhari, "3-CNF Satisfiability in Polynomial Time," (as invited paper) in *5th Indian International Conference on Artificial Intelligence* (IICAI-11), December 14-16, 2011, pp. 590-609, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

37. Anuradha Purohit. Arpit Bhardwaj, Aruna Tiwari and Narendra S Chaudhari, "Handling the problem of code bloating to enhance the performance of classifier designed using genetic programming," In, Proceedings, *5th Indian International Conference on Artificial Intelligence* (IICAI-11), Bhanu Prasad, Pawan Lingras, Ramakant Nevatia (Eds.): pp. 333-342 December 14-16, 2011, ISBN 978-0-9727412-8-6, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

38. Pratibha Singh, Sapna Gulani, Ajay Verma, Narendra S. Chaudhari, "An Intelligent Network for handwritten Devnagri Digit recognition using Structural features," In, Proceedings, *5th Indian International Conference on Artificial Intelligence* (IICAI-11), Bhanu Prasad, Pawan Lingras, Ramakant Nevatia (Eds.): pp. 105-112, December 14-16, 2011, ISBN 978-0-9727412-8-6, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

39. Pratibha Singh, Juhi Sabharwal, Ajay Verma, Narendra S. Chaudhari, "An Efficient method for the Devnagri handwritten vowel recognition," In, Proceedings, In, Proceedings, In,

Proceedings, *5th Indian International Conference on Artificial Intelligence* (IICAI-11), Bhanu Prasad, Pawan Lingras, Ramakant Nevatia (Eds.): pp. 113-120, December 14-16, 2011, ISBN 978-0-9727412-8-6, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

40. Rajkumar Jain, Narendra S. Chaudhari, "Formulation of 3-Clustering as a 3-SAT Problem", In, Proceedings, *5th Indian International Conference on Artificial Intelligence* (IICAI-11), Bhanu Prasad, Pawan Lingras, Ramakant Nevatia (Eds.): pp. 465-472, December 14-16, 2011, ISBN 978-0-9727412-8-6, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

41. Jaya Thomas and Narendra S Chaudhari, "Two Approaches for Hamiltonian Circuit Problem using Satisfiability", *5th Indian International Conference on Artificial Intelligence* (IICAI-11), Bhanu Prasad, Pawan Lingras, Ramakant Nevatia (Eds.): pp. 601-617, December 14-16, 2011, ISBN 978-0-9727412-8-6, Siddaganga Institute of Technology (SIT), Tumkur, Bangalore, India.

42. Neetesh Saxena and Narendra S. Chaudhari, "An Approach for Secure SMS Transmission in GSM Network", International Conference on Communication and Networks (CoMNet-2011), College of Technology and Engineering, MPUAT, Udaipur, 4th -6th Dec 2011.

43. Narendra S. Chaudhari, "NP=P: Polynomial Solvability of 3-SAT", (An Invited Talk): In, *Proceedings, International Conference on Advances in Modelling, Optimization, and Computing* (AMOC-2011), Indian Institute of Technology, Roorkee (05-07 Dec. 2011).

44. Shukai Li, Ivor W. Tsang, Narendra S. Chaudhari, "Infinite Decision Agent Ensemble Learning System for Credit Risk Analysis," in *Proceedings, 10th IEEE International Conference on Machine Learning and Application,* pp. 36-39, Honolulu, Hawaii, USA (Nov. 2011).

45. Rajkumar Jain, Narendra S. Chaudhari, "*Identification & Generation of Constraints in Social Network",* In, Proceedings, International Conference "Emerging Trends in Networks & Computer Communications" (ETNCC 2011), (Ed. D. Singh), pp. 11-14, April 22-24, 2011, College of Technology & Engineering, Maharana Pratap University of Agri. & Tech, Udaipur, Rajasthan, Co-Sponsored by IEEE.

46. Jaya Thomas and Narendra S Chaudhari, "*Polynomial Solvability of Satisfiability and its implication to hybrid cryptosystem security",* In, Proceedings, IEEE International

Conference "Emerging Trends in Networks & Computer Communications" (ETNCC 2011), (Ed. D. Singh), pp. 52-54, April 22-24, 2011, College of Technology & Engineering, Maharana Pratap University of Agri. & Tech, Udaipur, Rajasthan, Co-Sponsored by IEEE.

47. Prakash C. Sharma and Narendra S Chaudhari, "*A Graph Colouring Approach for Channel Assignment in Cellular Network through Propositional Satisfiabilty"*, In, Proceedings, IEEE International Conference "Emerging Trends in Networks & Computer Communications" (ETNCC 2011), (Ed. D. Singh), pp. 23-26, April 22-24, 2011, College of Technology & Engineering, Maharana Pratap University of Agri. & Tech, Udaipur, Rajasthan, Co-Sponsored by IEEE.

48. Khitij Pathak, Aruna Tiwari and Narendra S. Chaudhari, "*A Reduction of 3-SAT problem from optimal sanitization in Association Rule Hiding",* In, Proceedings, IEEE International Conference "Emerging Trends in Networks & Computer Communications" (ETNCC 2011) April 22-24, 2011, (Ed. D. Singh), pp. 43-46, College of Technology & Engineering, Maharana Pratap University of Agri. & Tech, Udaipur, Rajasthan, Co-Sponsored by IEEE.

49. Pratibha Singh, Ajay Verma, Narendra S. Chaudhari, "Performance analysis of flexible zone based features to classify Hindi numerals," In, Proceedings of The 2011 3rd International Conference on Electronics Computer Technology (ICECT 2011) Kanyakumari, Digital Object Identifier: 10.1109/ICECTECH. 2011.5942101, pp. V6-292-296. (8-10 April 2011).

CURRENT RESEARCH PROJECTS

- Artificial Intelligence in Problems of Computer Security (Jointly with Prof Ivan Zelinka, Department of Computer Science, Faculty of Electrical Engineering and Computer Science VŠB-TU Ostrava, Czech Republic)

- Routing and Message Information Security in Wireless Networks (Supported by Tata Consultancy Services (TCS), Delhi)

RESEARCH STUDENT ACHIEVEMENTS (during the period of April 2011 to till date):

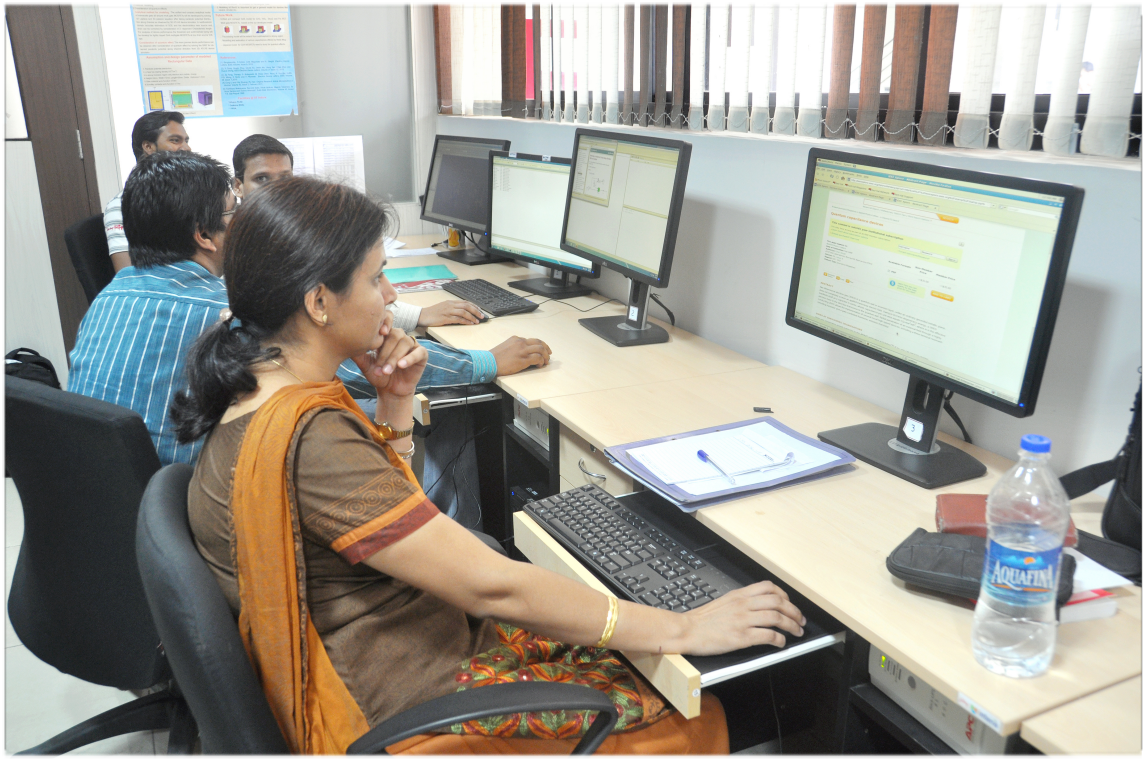
- Neetesh Saxena, Ph.D. student received the Tata Consultancy Services (TCS) Fellowship Award for his research work in Security Wireless Networks at IIT Indore (March, 2012).

- Ms. Jaya Thomas, and Mr. Neetesh Saxena, PhD students, won the Council of Scientific & Industrial Research (CSIR) 2012 : *Foreign Travel Grant for Young Scientist to attend International Conferenc*e (April, 2012).

- Mr. Rajkumar Jain, Mr. Prakash Sharma, and Mr. Neetesh Saexna, PhD students, won the Department of Science and Technology (DST), Government of India, International Travel Support (ITS) Scheme: (includes: Full economy class air-fare by shortest route, airport-tax, visa fees and Registration Fee).

- Ms. Jaya Thomas won the travel grant award by (organizers of) Indo-U.S. Symposium on Women in Engineering. *Travel Grant, hospitality, and complimentary Registration* for the event: Indo-U.S. Symposium on Women in Engineering entitled '*Women Engineers Leading Global Innovation*' (29-31 Aug. 2012).

- Mr. Neetesh Saxena**,** PhD student is nominated by the Institute for "Technology Vision 2035 Exercise' to visualize the future in the context of technologies that may emerge and create a paradigm shift in lives of Indians. The initiative is taken by TIFAC, an autonomous body under Department of Science and Technology (DST), Govt. of India.



Computer Labs





SCHOOL OF HUMANITIES AND SOCIAL SCIENCES


आभासीय कक्षा
VIRTUAL CLASSROOM


आभासीय कक्षा
VIRTUAL CLASSROOM
भारतीय प्रौद्योगिकी संस्थान इन्दौर
INDIAN INSTITUTE OF TECHNOLOGY INDORE

FACULTY AND RESEARCH
ENGLISH DISCIPLINE



Dr Amarjeet Nayak

Indian Writing in English
Postcolonial Theory
Translation Studies
Comparative Literature



Dr Joe Varghese Yeldho

African American Literature
Urban Narratives
Event Studies

PSYCHOLOGY DISCIPLINE



Dr Nirmala Menon

Postcolonial Literature
Globalization Studies
Critical and Cultural Theory
Translation Studies
Institutionalization of Postcolonial Literature



Dr Sanjram Premjit

Cognitive Ergonomics
Human-System Interaction
Usability

ECONOMICS DISCIPLINE



Dr Pritee Sharma
Agriculture Economics
Development Economics



Dr Ruchi Sharma
International R & D Spillovers
Technology Transfer
Intellectual Property Rights



PHILOSOPHY DISCIPLINE

Dr C. Upendra

Dr Bharath Kumar
Moral and Political Philosophy

Epistemology
History of Philosophy

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

The School of Humanities and Social Sciences has a two-fold purpose: 1) It aims to equip the Institute's Technology and Engineering students with the tools needed to supplement their technical education with humanistic goals. These include thinking critically and asking questions that help gain insights to everything from economics and politics; literature and philosophy. We believe that research into the human experience widens students' perspectives about the world around us and contributes towards imagining a future that will create a better and equal world. This exploration is therefore an important part of their engineering education at IIT Indore. Undergraduate students typically average between 13.5 and 16.5 credits in courses and electives from the school of Humanities and Social Sciences. 2) Apart from the commitment to our undergraduate students, the School of Humanities and Social Sciences has doctoral programs in Economics, English, Philosophy and Psychology. The school will commence its Sociology discipline soon. An inter-disciplinary Masters Program (MS) will also commence in the near future.

PROGRAMS OFFERED

- The school offers PhD in Economics, English, Philosophy, and Psychological Science.
- PhD Courses
- Undergraduate Elective Courses
- The School of Humanities and Social Sciences in association with the Central Library of IIT Indore and Alliance Francaise (Bhopal) will introduce an 80 hours course in French Language.

FACULTY:

Currently the School has seven faculty members in the disciplines of Economics, English, Philosophy, and Psychology. The School intends to expand the program offerings and recruit diverse faculty in all the disciplines while also starting new programmes in Sociology, Psychology, and others.

1. Economics:

Expertise and Research Areas: Intellectual Property Rights, Innovation, Technology Transfer, Patent policy and its implications for Reseach and Industry, Agricultural policy, rural poverty, WTO and developing economies, Climate change and Energy subsidies.

Faculty Members working in the above areas are Drs. Pritee Sharma and Ruchi Sharma.

2. English:

Expertise and Research Areas: Indian writing in English, Postcolonial literature, Translation studies, Dalit literatures, South Asian Diaspora literature, African American fiction, Urban Narratives and events, Civil Rights' narratives and its impact on Literature, Literary protocols in twenty first century texts.

Faculty members working in the above areas are Drs Amarjeet Nayak and Joe Yeldho Varghese.

3. Philosophy:

Expertise and Research Areas: Social and Political Philosophy, Moral Philosophy, Nationalism, Multiculturalism, Citizenship, Contemporary Indian Philosophy, Epistemology, Philosophy of Cinema and new media, History of the foundations of Social Sciences.

Faculty members working in the above areas are Drs Bharak Kumar and C.Upendra.

4. Psychology:

Expertise and Research Areas: Human Factors and Applied Cognition, Human Errors, Human Multitasking, Human Factors in Computer and Information Systems, Interactive System Design & Evaluation, Psychology of Programming/ Empirical Study of Programming, Social Design and User Cognition.
Dr Sanjram Premjit is the faculty member working in the above areas of the discipline.

CURRENT RESEARCH PROJECTS

1. Name of the Principal Investigator: Dr. Ruchi Sharma

   "The Impact of Patent Policy on India's Innovativeness and Technology Transfer"
   Agency: Indian Council for Social Science Research, New Delhi, India.
   Budget Sanctioned: Rs. 3,94,525/-
   Institute overhead amount: Rs. 29, 707/-
   Duration (start date-to likely date of completion): 15 march 2011 to 15 September, 2012
   Project Staff employed: Aparna Sharma, Research Associate, 1 August, 2011.

2. Name of the Principal Investigator: Dr. C. Upendra

   "Explaining the Moral Compass: Away from the Dead End"
   Agency: Indian Council of Philosophical Research, New Delhi, India.

SELECTED PUBLICATIONS:

Kumar, Bharath. "The Problem of Nationalism: The Moral Dimension", Tattva, Journal of Philosophy, Christ University, Bangalore, Vol. 4, No.1, Jan-June 2012. ISSN: 0975-33XX

Kumar, Bharath. "The Texture of the Concept of Nationalism", Wesleyan Journal of Research, Bankura Christian College, Vol. 4, No. 1, 2011. ISSN: 09751386

Kumar, Bharath. 8 Units on "Gandhian Philosophy" for the Indira Gandhi National Open University, New Delhi, Post-Graduate Programme in Philosophy, June 2011.

Kumar, Bharath. "Civic Nationalism Vs Ethnic Nationalism", Journal of Indian Council of Philosophical Research, New Delhi, Vol.XXVIII, No.2, April-June 2011, pp136-140 .

Nayak, Amarjeet. "Oscillating between Propaganda and High Art: Dealing with Conflicts in Indian English Poetry", Lapis Lazuli – An International Literary Journal, Vol. II, Issue I, Spring 2012.

Nayak, Amarjeet. “Sweeping Generalizations and False Dichotomies: An Examination of the Insider-Outsider Dichotomy in Anjum Hasan’s Lunatic in My Head”, ed. Indu Swami. Exploring North-East Indian Writings in English, Vol. 2, New Delhi: Sarup Book Publishers, 2012, pp. 44 – 55.

Sanjram, P. K., & Khan, A. (2010). Attention and programmer characteristics in prospective memory: an investigation of habit intrusion error in programmer multitasking, Proceedings of the 28th Annual European Conference on Cognitive Ergonomics. Delft, Netherlands: ACM. doi: 10.1145/1962300.1962365.

Sanjram, P. K., and Khan A. "Attention, Polychronicity, and Expertise in Prospective Memory Performance: Programmers’ Vulnerability to Habit Intrusion Error in Multitasking." International Journal of Human-Computer Studies. 69 (6) 2011, pp. 428-439. doi:10.1016/j.ijhcs.2011.01.006.

Sharma, Ruchi and K.K. Saxena. "Strengthening Patent Regime: Benefits for Developing Countries - A Survey." Journal of Intellectual Property Rights, Vol. 17 (2) 2012. pp.122-132.

Sharma, Ruchi. Patent Policy and Research and Development Expenditure: Evidence from Indian Industry. Knowledge Globalization Conference, held at Pune from January 5-7 2012, 193-200. ISBN 978-0-979-7593-3-8.

Sharma, R., and K.K. Saxena. 2012. The Influence of Patent Protection on Developing Countries' Innovation and Technology Transfer. Forthcoming in The Global Studies Journal.

Upendra, C., Review of Alison Assiter’s Kierkegaard, Metaphysics and Political Theory (Continuum, 2009), Philosophy in Review.

Upendra, C., Review of Christopher Heath Wellman and Phillip Cole’s Debating the Ethics of Immigration: Is There A Right to Exclude? (Oxford University Press, 2011), Journal of Studies in Social and Political Thought.

Upendra, C., Review of Chad Wellmon’s Becoming Human: Romantic Anthropology and the Embodiment of Freedom (The Pennsylvania State University Press, 2010), Studies in Social and Political Thought.

Upendra, C., Review of Terry Eagleton’s Why Marx Was Right? (Yale University Press, 2011), REASON PAPERS.

Upendra, C., “The Dynamics of Minority Redemption” for an Anthology on Becoming MInority: Perspectives on Europe and India, Jyotirmay Tripathy & S. Padmanabhan (Routledge India)

Upendra, C., Review of Virture and Politics: Alasdair’s Macintyre’s Revolutionary Aristotelianism by Paul Blackledge and Kelvin Knight (University of Notre Dame Press, 2011), Poltical Studies Review, Accepted.

SEMINARS/ CONFERENCES/WORKSHOPS

Kumar, Bharath. "Cultural Politics" as part of the IUAES (The International Union of Anthropological and Ethnological Sciences) Commission on Ethnic Relations sponsored panel "Ethnicity & Citizenship" at a conference on 'Knowledge and Value in a Globalising World: Disentangling Dichotomies, Querying Unities' at Perth, Western Australia, 5-8 July 2011. (in absentia)

Kumar, Bharath. "Social Aspects of Buddhism: Two Visions" at a National Seminar on Social Dimensions of Buddhism organised by Centre for Mahayana Buddhist Studies, Nagarjuna University, Guntur, 16-17 September 2011.

Kumar, Bharath. "Multiculturalism and the Urban" at an International Seminar on Demystifying the Urban: Borderlands of Canada and India organized by the Centre for Canadian Studies, Department of Comparative Literature, Jadavpur University, Kolkata from 1st to 3rd February 2012.

Kumar, Bharath. "Justice in and through Multiculturalism" at a National Seminar Justice and Multiculturalism organised by Department of Philosophy, Dravidian University, Kuppam during 8-10th February 2012.

Kumar, Bharath. "Thematic and Problematic in Indian Nationalism" at Re-visiting Indian Nationalism organised by Department of History, Kurukshetra University, 18th February, 2012.

Nayak, Amarjeet. “Reinventing the Northeast Indian English Literary Tradition through Productive Negotiations among diverse Literary Traditions: A Close Reading of Selected Short Fiction in English from the Northeast India”, International Conference Narrativizing the margins: Northeast India and Beyond, 4 – 6 January, 2012 at Assam University, Diphu Campus, Assam.

Nayak, Amarjeet. Participated in a Study Workshop on Education organized by Krishnamurti Education Trust at Sanjeevan Vidyalaya, Panchgani, November 3 – 7, 2011.

Sanjram, P. K. & Gupta M. (2011). Task difficulty and time constraints in programmer multitasking: An analysis of prospective memory performance and cognitive workload. HWWE 2011, International Conference on Ergonomics and Human Factors. (December 15-17), IIT Madras, Madras, India.

Sharma, Ruchi. "Patent Policy and Research and Development Expenditure: Evidence from Indian Industry", Knowledge Globalization Conference held at FLAME, Pune, India from January 5-7, 2012.

Sharma, Ruchi. "Harmonization of Patent Rights for Software," Invited Lecture for the National Conference on the Enforcement of Intellectual Property Rights in Electronics & IT sector organized by Confederation of Indian Industry, April 20, 2012 at Hotel Fortune Landmark, Indore.

Upendra, C., "Living in the End Times: Critical Analysis" at a National Seminar Justice and Multiculturalism organised by Department of Philosophy, Dravidian University, Kuppam during 8-10th February 2012.

Yeldho, Joe Varghese."Pedestrian Events: Folds and Imagined Cities in Inception." Presented at C PRACSIS (Centre for Performance Research and Culture Studies in South Asia) International Conference on Visual Spaces (January, 2012), Asian College of Journalism, Chennai.

STUDENT PUBLICATIONS:

Chattopadhyay, Sagarika and Jaya Shrivastava. "Transitional Identities and the Unhomed Space in Monica Ali's Brick Lane and Tishani Doshi's The Pleasure Seekers". Asiatic, 6.1 (2012) 113-125.

RESEARCH FACILITIES:

The School is continually expanding its collection of primary and secondary sources, textbooks, reference books in all areas. It is also increasing subscription to international databases and other electronic resources that are crucial for faculty research and development; it is also essential for our doctoral candidates to have access to latest research techniques and information about advancements in their respective fields.

Economics: The following data analysis software is now available for students and faculty at IIT, Indore.

Software Packages		Description
1.	STATA 11	STATA is an integrated statistical package for data analysis, data management, and graphics. Stata 11 has features such as generalized method of moments (GMM), competing-risks regression, state-space modelling, predictive margins, a Variables Manager, and more.

2.	ArcView	ArcView is geographic information system (GIS) software for visualizing, managing, creating, and analyzing geospatial data.
Databases		Description
1.	CMIE DATABASES	CMIE Indian Harvest, CMIE State Analysis Services, CMIE India Trades, and CMIE Prowess.
2.	World Development Indicators	WDI is an internationally acknowledged database of 331 indicators for 209 countries from 1960 to 2008.

Language Lab: A Language Lab equipped with software and hardware to enable learning of English has been completed. The Language Lab is also fitted with audio-visual technology so students can get help in comprehension and spoken language.



Audio-Visual Language Lab



Human Factors and Applied Cognition Lab: The school has established a human factors research lab under the discipline of psychological sciences. This facility is actively utilized to perform applied research in an effort to address real-world problems with scientific rigor. Lab members are passionate about research projects that will have social implications. Research at 'Human Factors & Applied Cognition Lab focus' in the areas of: Interaction, Transport, Performance, and Innovation.



CONGRATULATIONS TO OUR STUDENT ACHIEVERS:

Ashok Pancily Poothiyot of the 2010 CSE B.Tech. batch has been selected as a Google Student Ambassador(GSA) for the year 2012-2013. The Google Student Ambassador Program is an opportunity for students to serve as liaisons between Google and their universities and aims at building networks with Googlers and fellow Ambassadors. GSAs will coordinate with Google to plan and host events on campus, act as a campus contact for Google University Relations teams, and help Google better understand every university's culture. This year the program is to select a total of over 1,000 students across 65 countries globally. A total of about 100 GSAs have been selected from India on the basis of scrutiny of applications by Google. Ashok will represent our Institute in the Google Student Ambassador's Summit at the Hilton Hotel, Goa from 7th to 9th of September 2012. This is a wonderful opportunity for Ashok and we wish him the very best.

Ms. Priti Ram and Mr. Anil Birla for being selected for IIT Indore-Agilent Technologies -Aimil Summer Fellowship Programme on X-ray Crystallography.

Research Scholars and their faculty advisors of the Physics department at IIT Indore join the ALICE International Collaboration at the Large Hadron Collider (LHC), CERN, Geneva, Switzerland.

STUDENT ACTIVITIES AND CAMPUS LIFE



Campus life and Student Activities

Students at IIT, Indore have the next best thing to being on a common campus. All students from all batches including Post graduate students are housed in Silver Springs Township, an integrated township on the outskirts of Indore city. The Institute runs the student mess and cafeteria and there are regular bus shuttles all day and late into the night for students to go to and fro from campus. A plan for a library to be set up in the township is underway.

IIT Indore hosted the first All India sports festival 'FEROCIA -2011' with nearly 20 colleges nationwide and over 1200 participants being involved in the event. Students availed of some really world class coaching camps and the their performance in the inter-IIT aquatics meet Students also organized the cultural-technical festival FLUXUS-2012 for the second year. This year's theme was 'SAVE THE GIRL CHILD'. The event was a big success with a total of 600 participants including the team from BSF. The event was reported in local newspapers and attracted local participation.

This year Student Gymkhana started various clubs to encourage students' extra curricular activities. Students participated in various events organized by these clubs. "Robo Soccer" was conducted by the Robotic club, the music program "Crescendo" was organized by the music club and a "Spell Bee" was conducted by the Literary club. The institute also appointed a part time music teacher for students. The students Gymkhana also released the second edition of "Inscription", the student magazine, with thought provoking articles on the year's focal theme "Nature and Environment"











Residences for PhD research scholars



Indian Institute of Technology Indore
M-Block, Institute of Engineering and Technology DAVV Campus,
Khandwa Road, Indore – 452017, Madhya Pradesh, India
Tel: +91 - 731 – 2364182, Fax: +91 - 731 – 2361482,
Email: contactus@iiti.ac.in