COLLABORATION

2023

सत्यमेव जयते
Goverment Of India

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Message from the Chairman (BoG)

It gives me immense pleasure to welcome the Industry fraternity to our institution for fostering strong bonding. Theory and practical should always go hand-in-hand. The progress happens only when there is a mutual benefit. The relationship between industry and educational institutions is crucial in shaping the workforce of the future. Educational institutions, including colleges, and universities, play a pivotal role in preparing individuals with the knowledge and skills needed to thrive in various industries.

These institutions provide the foundation for learning and skill development, equipping students with both theoretical understanding and practical abilities. On the other hand, industries have a responsibility to engage with educational institutions through partnerships, internships, employment, collaboration and research on practical development. This synergy ensures that education remains relevant to the demands of the job market, fosters innovation, and promotes a seamless transition for students into the workforce. A strong partnership between industry and education is essential for economic growth and the continuous advancement of society.

The collaboration between industry and engineering institutions is also paramount in driving technological progress and innovation. Engineering institutions, such as universities and research centres, serve as hubs for knowledge creation and dissemination. They play a crucial role in educating future engineers and scientists while also conducting cutting-edge research. This research is of utmost importance as it addresses real-world challenges and pushes the boundaries of what is possible. It often results in the development of new technologies, processes, and solutions that benefit various industries. By engaging with engineering institutions, industries gain access to this pool of talent and expertise, fostering a dynamic exchange of ideas and resources.

In turn, this collaboration not only drives economic growth but also ensures that the products and services produced are at the forefront of technological advancements, benefiting society as a whole. In essence, the synergy between industry and engineering institutions, supported by robust research, forms the cornerstone of progress in our modern world.

I wish great success to this association and trust that it will be mutually beneficial.

Dr. Suresh Haware
B.Tech, Nuclear Scientist, Ph.D.
Chairman, BOG
NIT, Raipur

Message from the Director (NIT, Raipur)

It brings me great pleasure to announce that NIT Raipur is set to release a booklet centred around the theme of "Collaboration."

The importance of forging strong bonds between academia and industry cannot be overstated. Such collaborations are pivotal for the sustainable advancement of technology, the economy, and indeed, our entire civilization. Since its establishment in 1956, NIT Raipur has been unwaveringly committed to nurturing a mutually beneficial relationship with various industries.

The interaction between institutes and industries is an indispensable prerequisite for nurturing, developing, and deploying the right kind of technical talent that is essential for fostering industrial and economic progress. Collaborative partnerships between industry and academia serve as catalysts for innovation, creating new value and contributing significantly to the prosperity of our nation. This partnership entails a spectrum of activities, including interaction programs, research collaborations, provision of research and consultancy services to industries, co-organization of seminars, symposiums, and workshops, on-site and on-campus training of industrial personnel, inviting industry experts for lectures and student interactions, and the gradual development of collaborative infrastructure.

I extend my heartfelt appreciation to the Industry and Institute Collaboration Cell (IICC) for taking on this monumental task of encapsulating the strengths of our esteemed institution in this booklet. My best wishes go out to all the members for their unwavering commitment for achieving excellence.

In today’s world, research must enhance and support Industry projects. We believe in joining Industry cluster to collaborate with our institute. I firmly believe that readers will find this booklet to be a remarkable resource, providing valuable insights into the strengths and capabilities of NIT Raipur.

Dr. N.V. Ramana Rao
Director
NIT Raipur

Message from the Chairperson (IICC)

With the advent of globalization and opening of Indian economy, competition among industries has become neck to neck. In order to solve their engineering problems, they now look up to technical institutions. Similarly, there is an urgent need to prepare engineering students for jobs in multinational companies, by equipping them to newer technologies. These can only be achieved well by bridging the gap between industry and academic institutions. Better interaction between technical institutions and industry is the need of the hour. This will have great bearing on the engineering curriculum, exposure of engineering students to the industrial environment, and subsequent placement of new graduating engineers in industries across the country.

Industries and institutes have been collaborating for a long time, but the sudden rise of a global knowledge economy has intensified the need for strategic partnerships. Although the technical Institutes are already imparting basic knowledge and skills to the students, this Industry-Institute interaction will enable to undertake research projects by staff and students relevant to the industry. The Industry-Institute interaction needs to be designed to run for a longer period to prepare the manpower of world-class in the field of science and technology by inculcating the various skills required by the industry, thereby contributing to the economic and social development at large.

In order to develop the "Make in India" program, more manpower has to be deployed in order to ensure the required development. Though the availability of manpower is abundant in India, well-equipped manpower with employability skills is the need of the hour. There is a need to create avenues for closer academia and industry interaction through all the phases of technology development, starting from conceptualizing to commercialization.

NIT Raipur has crafted a unique Industry-Institution interaction initiative as one of its core pillars through the formation of Industry and Institute Collaboration Cell (IIC Cell) under the mentorship of the Honourable Director. This initiative shall go a long way to fulfill the needs of globalization. The IIC cell is publishing a booklet on “Collaboration- 2023” to reflect “Strength of the Institute”. I am sure that this booklet will help in developing expertise and competency to offer better services to the Indian Industry. Here's wishing this unique venture a huge success.

Dr. S. L. Sinha
Chairperson,
Industry and Institute Collaboration Cell
NIT, Raipur

ABOUT NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR, IIC CELL

National Institute of Technology Raipur (Formerly Government Engineering College Raipur), situated in the capital of state of Chhattisgarh, has proven to be “Excellent” in the field of science and technology over past six decades in this region. With sweet memory of foundation ceremony by our president Hon'ble Dr. Rajendra Prasad on 14th September 1956, the Institute started with two departments namely Metallurgical and Mining Engineering. Later the inauguration of the Institute building was done by Prime Minister Hon'ble Pt. Jawahar Lal Nehru on 14th March 1963. From 1st December 2005, the Institute has become the National Institute of Technology, an Institute of National Importance.

Located centrally, with good connectivity from all parts of the state and country, NIT Raipur has all the key ingredients to promote and contribute towards the socio-economic growth of the central part of India. Of the major strengths, the one that needs mention foremost is the availability of resources in the form of technically strong and qualified faculty along with state of art infrastructure in abundance. The Institute is committed to the challenging task of development of technical education by preparing seasoned graduates in highly sophisticated fields of engineering and technology. The Institute is contributing to the technological, industrial, and economic development of the region and the country and has been recognized for its role in engineering education, generation, and dissemination of useful and relevant technologies in the service of society.

VISION

To be a leader in technical and management education in India and to establish a unique identity for the development of high-quality human and knowledge resources in diverse areas of technology and management.

MISSION

To re-engineer engineering education and to mould young students into rational-thinking engineers who are motivated by a passion for professional excellence driven by human values and proactively engaged in the betterment of society.

OBJECTIVES OF THE IIC CELL:

- To cultivate strong links with industry.
- To explore and identify common avenues of interaction with industry.
- To synchronize the quality of education by continuous advancement of educational programs.
- To meet the trends of the industry and produce employable "Industry-ready students".
- To promote research suited to industry needs, consultancy, and other industry-related activities and catalyze the growth of the institute-industry collaboration.
- To integrate industrial training and feedback for the benefit of the students and offer facilities to practicing engineers and professionals for their continuous development.

The composition of the cell is given below:

Faculty from Institute	Special Invitees from Industry
Dr. Shobha Lata Sinha (Chairperson) Professor & Head, Mechanical Engineering Email Id: slsinha.mech@nitrr.ac.in Mobile: 9826315780	**Manoj Kumar, AGM (MM)** NTPC-SAIL Power Company Ltd, Bhilai. Email Id: manoj.kumar@nspcl.co.in Mobile: 9437037846
Dr. N.V. Swamy Naidu (Member) Associate Professor, Mechanical Engineering Email Id: nvsnaidu.mech@nitrr.ac.in Mobile: 9963390988	**Er. Sandeep Kumar Varma, CEE** Chhattisgarh State Power Distribution Co. Ltd Email Id: sandeepapama63@gmail.com Mobile: 9425211356
Prof. Harendra Bikrol (Member) Associate Professor, Computer Applications Email Id: hbikrol.mca@nitrr.ac.in Mobile: 9406230141	**Shri Pawan Kumar, ED P & A** Bhilai Steel Plant, Bhilai, CG Email Id: edpa.bsp@sail.in Mobile: 07882862009, 9407980265
Dr. Himanshu Govil (Member) Assistant Professor, Applied Geology Email Id: hgovil.geo@nitrr.ac.in Mobile: 9927337832	**Er. K.K. Sarda, CMD** Sarda Energy & Minerals Ltd, Raipur Email Id: kksarda@seml.co.in Phone: 07712214111/112

DEPARTMENT'S COMPETENCIES
&
ACHIEVEMENTS

DEPARTMENT OF APPLIED GEOLOGY

The Department of Applied Geology came into existence in the year 1961 with the prime aim of preparing the post-graduates students (M. Tech. Degree) for the future needs as Geologists / Earth Scientists to a number of Central, State, Public and Private Organizations. The Department has significant role in carrying out testing and consultancy projects for over four decades and now expects to play a major role in the development of mineral rich Chhattisgarh State, as far as Geological, Geophysical, Mining, Mineral and Natural Resource Management are concerned. Besides, the Department also offers Ph. D. Degree in various disciplines of Geology. It is highly remarkable that the alumni of this department are occupying key positions in leading organizations of the country.

- **Area of Expertise:**
  Structural Geological Mapping and Field Geology, Mineralogy, Petrology, Engineering Geology, Hydrogeology, Remote Sensing and GIS and, Mineral Exploration.

- **Research Projects:**
  1. Identification of Potential Groundwater Artificial Recharge Zones for Rainwater Harvesting in Raipur Municipal corporation and Naya Raipur Area, Chhattisgarh / CGCOST, Govt. of Chhattisgarh / Rs. 5.00 Lakhs.
  2. Identification, Mapping and Spectral Library Generation for Hydrothermally Altered, Weathered and Clay Minerals / ISRO, Govt. of India / Rs. 19.50 Lakhs.
  3. Utilization of Dual Frequency Polarimetric SAR Data for Scattering based Sub-Surface Geological and Linear Feature Characterization / ISRO, Govt. of India / Rs. 18.51 Lakhs.
  4. Lithological / Mineralogical Mapping of Different Minerals Through Different Indices/ Ratioing Techniques Using Remote Sensing Data / NIT Raipur Seed Grant / Rs. 5.00 Lakhs.
  5. Consultancy project of preparation of Geological Report and Pre-feasibility Report of Prospecting Operation for Iron Ores carrying out at Dantewada District / Jindal Steel & Power Limited, Raipur / Rs. 11.80 Lakhs.

- **List of Agencies to whom Department has provided the Testing and Consultancy:**
  1. Jindal Steel and Power Limited, Raipur (C.G.)
  2. South Eastern Coalfields Limited
  3. Chhattisgarh Environment Conservation Board, Chhattisgarh
  4. Hira Power and Steel ltd.
  5. Larsen and Toubro Ltd. Raipur (C.G.)
  6. Kangaroo Minerals Ltd. TANZANIA
  7. M.K.S. Minerals & Marbles, MANDLA (M.P.)
  8. Mahendra Sponge & Power Ltd. RAIPUR (C.G.)
  9. HIRA, Godawari Power & Ispat Ltd. RAIPUR (C.G.)
  10. Arti Infrastructure and Buildcon Limited, RAIPUR (C.G.)
  11. Dee Vee Project Ltd. Korba (C.G.)

12. Godawari Power & Ispat Limited,Raipur (C.G.)
13. Pilliwar & Associate, Raipur (C.G.)
14. Airport Authority of India, Raipur (C.G.)
15. Siddharth Geo Consultant (India) Pvt. Ltd., Raipur (C.G.)
16. Build Earth Sand LLP, HOSPET, Karnataka
17. MECON Limited
18. RDC Concrete (India) Pvt. Ltd.,
19. Punj Lloyed Limited
20. Build Earth Sand LLP, Baldota Enclave, Karnataka
21. Siddharth Geo Consultant (India) Pvt. Ltd
22. HIRA, Godawari Power &Ispat Ltd.
23. P. M. Purkar, Geologist, Bhilai
24. M.K.S. Minerals & Marbles, Azad Ward, MANDLA
25. Geologist, Exploration Techniques, Bhilai
26. Sharda Enterprises, Durg
27. IL&FS Engg. Construction Company Ltd. Anuppur
28. Chhattisgarh Distilleries Ltd. Kumhari, Durg
29. M.R.P Disnet Division, No.3, Tilda, Raipur (C.G.)
30. Petron Civil Engineering Pvt. Ltd. Rawan Village, Raipur

- **Testing Facilities/Equipments available in the Department:**

1. Facilities for preparation of thin and polished sections of Rocks and Ores
2. Advanced Microscopes with camera facility for Petrographic analysis of Rocks and Ores.
3. Advanced Stereozoom Microscope with Photographic facility
4. Resistivity meter
5. Flame Photometer
6. Spectro Photometer
7. Laboratory distillation unit
8. Analytical Balance with Specific Gravity determination Kit
9. Fumehood
10. Magnetic Stirrer with Bars
11. Laboratory Oven
12. VacuumFiltration Unit
13. Instruments related to Hydrogeological Investigation / Soil Resistivity Survey
14. Instruments for Groundwater Quality Analysis
15. Application of Remote Sensing and GIS in Hydrological Studies and Mineral Exploration
16. Digital Schmidt Hammer
17. DGPS
18. Unmanned Aerial Vehicle (UAV)
19. Field Equipment Kit i.e. Brunton Compass, Geological Hammers, Global Positioning System (GPS)
20. Software (ArcGIS, Erdas Imagine, Envi, IGIS, Aqua-Chem, WinRock, RockWorks and Surfer etc.) and Satellite data

v List of Lab and Testing Facility

S. No	Name of the Laboratory	Name of the Apparatus/ Equipment	Name of the testing conducted	Commercial Applications/Compliance
1	Hydrogeology Laboratory	UV-VIS Spectrophotometer	Minor ions and Trace metal determination	Determination of Heavy metals and Trace Contaminants
2	Hydrogeology Laboratory	Flame photometer	Major ion determination	Determination of Sodium and Potassium
3	Hydrogeology Laboratory	Multiparameter water quality meter	On site water investigation	Determination of water quality parameters like PH, TDS, Temperature, Conductivity etc. on filed
4	Hydrogeology Laboratory	Arsenator	Arsenic determination	Determination of Arsenic in Field
5	Hydrogeology Laboratory	Groundwater locators	Ground water location finding	Location and Depth determination of Groundwater
6	Hydrogeology Laboratory	Double ring infiltrometer	Infiltration Determination	Determination of Infiltration on field
7	Hydrogeology Laboratory	Open PAN Evaporimeter	Evaporation Determination	Determination of Evaporation
8	Hydrogeology Laboratory	Well Logger	Geophysical Survey	Subsurface geological investigation in Hard and soft rock areas
9	Hydrogeology Laboratory	Multielectrode resistivity Imaging System	Geophysical Survey	Subsurface geological investigation in Hard and soft rock areas
10	Hydrogeology Laboratory	Resistivity Meter	Geophysical Survey	Sub-Surface geological investigation
11	Petrology Lab	Research Microscope	Petrographic analysis of Rocks, Minerals and Ores	Petrographic Study
12	Petrology Lab	Digital Balance	Weighing and Specific Gravity determination	Determination of Specific Gravity
13	Cutting and Polishing Lab	BainThin-Geo	Slicing and Grinding Machine	Preparation of Thin and Polished Sections of rocks and minerals
14	Cutting and Polishing Lab	Labopol-5	Automatic Grinding Machine	Preparation of Thin and Polished Sections of rocks and minerals
15	Cutting and Polishing Lab	Diamond Cutter	Cutting of Rocks, Minerals and Ores	Preparation of Thin and Polished Sections of rocks and minerals

16	Cutting and Polishing Lab	Agate Mortar Pestle	Powdering of the Rocks, Minerals and Ores	Preparation of samples for analysis
17	Engineering Geology Lab	Schmidt Hammer	Strength determination of rocks	Insitu strength determination of rocks.
18	Engineering Geology Lab	Digital Schmidt Hammer	Strength determination of rocks	Insitu strength determination of rocks.
19	Micro-Paleontology Lab	Stereo Microscope	Identification of Microfossils and Grain Separation	Study of Microfossils and Grain Separation
20	Remote Sensing and GIS	UAV, DGPS, GPR,	UAV survey of mines	Mining survey, geology survey, underground survey etc.

DEPARTMENT OF ARCHITECTURE

In the spring of 1984, department of architecture emerged as a part of the then Government Engineering College Raipur with an intake of 20. The department took its present shape in 2021 with intake of 40.

The department also offers PhDs in the field of Architecture since 2010. Presently department there are 1 Professor, 2 Associate Professors and 9 Assistant Professors in the Department. Most of the faculty members are from Institutes of National Importance like IITs, NITs and SPAs.

Day by day the demand of Architectural professionals is increasing in the society. The endeavour of the department is to deliver these professionals to work for comfort and benefit of mankind at large. The Department has a great legacy of 37years with more than 800 alumni working across the Globe.

- **Area of Expertise:**

  Sustainable and Energy Efficient Architecture, Climate responsive Architecture, Vernacular Architecture, Environmental Planning & Management, Energy simulations studies, Town Planning, Housing, Urban Renewal, Building services, Urban Management & Finance, Building Constructions, Rural growth and Architecture, Social studies in Architecture History of Architecture, Space Syntax Analysis, Architectural Conservation, Intelligent Super tall Buildings, Industrialised Mass Housing, Indoor Air Quality, Shell Structure and Building Services.

- **Research Projects:**

1. Rural Spatial Study of Gram Panchayat of Jhit, Dist- Durg (C.G.) and Udaipur, Dist- Sarguja (C.G.), Funding amount Rs. 5,00,000/-, Funding Agency - Ministry of Panchayati Raj, Government of India.
2. Assessment of Thermal Conditions in EWS Monolithic Houses Being Constructed Under PMAY/ HFA Scheme AT Naya Raipur/ Bhilai/ Durg (C.G.), Funding amount - Rs. 90,000/-, Funding Agency - BSBK Pvt. Ltd.
3. Architectural Design Development of Self-Sufficient Housing in India, AICTE R & D Project, 1998-2001.
4. Modernization of Existing Computer Laboratory in Department of Architecture, Engineering College, Raipur, AICTE MODROBS project, 2000-2002.
5. Exploration of Possibilities of Industrialised Mass Housing in Urban Areas of Chhattisgarh Region of Madhya Pradesh, UGC Mini Research Project, 1996-99.
6. Development of Appropriate Architectural Designs of Industrialised Urban Mass Housing for Chhattisgarh Region of Madhya Pradesh, DST Science & Society Research Project, 1996-99.

DEPARTEMNT OF BIOMEDICAL ENGINEERING

The Department of Biomedical Engineering came into existence in the year 2003. The primary aim of the department is to provide the society with world-class competitive professionals in the field of Biomedical Engineering. The faculty and graduates, a driving force in creating engineering knowledge and novel Biomedical Technology that improve the human condition through advancement of health care and Biomedical Sciences, among the top most in India.

The department enables the students to understand the human body as an integrated system through quantitative engineering analysis and to use that understanding to design better therapeutic strategies, devices, and diagnostics. A mission of nearly equal importance is to serve society by conducting research that develops quantitative linkages across scales in the human body and uses that development to build new tools to improve human health. It also includes the following points:

- Institute-Industries collaborative activities on real life problem-solution approach.
- Serve our wider constituencies by offering our expertise to other health-related professionals, industries, state and local communities.
- Building excellent infrastructure for cutting-edge technology research in Health care science.
- Collaborative research with Pioneers of Biomedical Engineering Societies across the Globe.
- Built some specialized Centre of Excellence for conducting research on Future Health Care Sciences and Technologies.

The degrees offered by the department include B.Tech (Bachelor of Technology) and Ph.D. (Doctor of Philosophy in BME).

v Area of Expertise:

Includes Biochemistry/Enzyme Technology, Biosensor development for clinical application, Biomedical Signal Processing, Medical Imaging, Information Retrieval, Soft computing, Pattern recognition, Brain Functioning Analysis, Machine Learning, Lung Sound Analysis, Speech Signal Processing for medical applications, Multi-modal imaging, Clinical microfluidics, biomechanics, Tissue Engineering, Computational Fluid Dynamics, Signal Processing, Image processing, Photoplethysmogram, Process of Designing Medical technologies, Emerging Technologies in Healthcare, Medical Imaging, Computational & Multiscale Biomechanics, Orthopedic & Dental Implant Biomechanics, Finite Element Analysis.

v Research Projects :

1. Dr. Bikesh Kumar Singh, Computer aided technique for diseases diagnosis: A non-invasive approach of disease detection using IRIS image of 2.87 Lakhs, sponsored by CCOST.
2. Dr. Bikesh Kumar Singh, Computer aided analysis and interpretation of mammographic images for early diagnosis of breast cancer in Chhattisgarh of 3.60 Lakhs, sponsored by CCOST.
3. Dr. Bikesh Kumar Singh, Development of a risk stratification system for clinical management of sickle cell disease using predictive machine learning approaches, of 16.1 Lakhs, sponsored by SERB, Govt. of India.
4. Dr. Arindam Bit, Early Career Award: On-chip development of three-dimensional clinical graded tissue graft for the treatment of diseased esophageal segment with integration of vascularization,

and enhanced neurogenesis of Rs. 33,18,500, sponsored by Department of Science and Technology, India, (2017-2020).

5. Dr. Arindam Bit, Indo Russian Mega Grant: Regeneration mechanisms of deep-layer skin wounds in response to treatment with polyelectrolyte-hydrogel complex dressings and gene therapy of Rs. 29,50,000 and 3000,000 roubles, sponsored by Department of Science and Technology, India, and Russian Science Foundation, Russia, (2019-2021).
6. Dr. Arindam Bit, Technology Development Program - DST: Development of Microfluidic platform for point-of care diagnosis of sickle cell anemia of Chhattisgarh of Rs. 28,00,000 (in addition to Rs. 29,00,000 sponsored by Samplytics Pvt Limited, India), sponsored by Department of Science and Technology, India, (2019-2021).
7. Dr. Arindam Bit, Scheme for Promotion of Academic and Research Collaboration- MHRD India: Development of complete functional blood vessel network on multi-layered microfluidic platform of Rs. 53, 20,000, sponsored by Ministry of Human Resource Development, Govt. Of India, (2019-2021).
8. Dr. Saurabh Gupta, Three-dimensional Monte-Carlo Simulations for Photoacoustic Tomography using Graphics Processing Units of Rs. 20, 19,330, sponsored by DST SERB
9. Dr. Bikesh Kumar Singh, Development of a multi-modal artificial intelligent system for detection of endophenotypes in schizophrenia using automated speech and EEG signal analysis: An explorative study from Chhattisgarh State (Co-investigators: Dr. Lokesh Singh and Dr. Sai Krishna Tikka, AIIMS Raipur) of Rs. 2538240 sponsored by Department of Science and Technology, India.
10. Dr. Bikesh Kumar Singh, Development of breast cancer risk assessment system in women using advanced artificial intelligence techniques (Co-investigators: Dr. Kesari Verma and Dr. N. K. Bodhey from AIIMS Raipur) of Rs. 645000 sponsored by Indian Council of Medical Research India.
11. Dr. Bikesh Kumar Singh, Enhancing Brain Cognition through Neuro-Feedback model in Indian Children with Learning Disability as Co-PI) (PI: Geetanjali B. from SSN College of Engg., Chennai) of Rs. 4403080 from Science and Engineering Research Board (SERB), India.
12. Dr. Bikesh Kumar Singh, Development, and clinical validation of an Artificial Intelligence-based robust multi-channel device for differential diagnosis of asthma and COPD using respiratory sound). (Co-Principal investigators: Dr. A K Behera and Dr. Ranganathan T. Ganga from Pulmonary medicine Department AIIMS Raipur) of Rs. 2498930 from Department of health research, Indian Council of Medical Research, India.

v LAB FACILITIES

Labs are well equipped with various testing facilities (Bio recorders) which include:

1. 16 channel Bio-signal data acquisition system (AD Instrument) for: ECG, PPG, EEG, EMG, Force, Respiration etc.
2. 4 channel Bio-signal recorder (Biopacinc.) for: ECG, EMG, Pulse
3. 16 channel FNIRS Brain Imaging system
4. Wireless EMG system for EMG recording
5. Littmann Electronic Stethoscope for Lung and Heart Sounds recording
6. PCB prototype machine (NVIS72)
7. 32 channel EEG recorder
8. Digital Blood Pressure measurement device
9. 3-D printing of polymeric materials
10. 3D designing and subsequent polymeric printing
11. Designing of customized implant

12. Analysis of designed implant
13. Polymeric thin film production
14. Powder formation of liquid samples / solvents
15. Z 840 Workstation for Deep Learning/ AI applications
16. Virtual Reality Headset (HTC Vive Pro)
17.

v LAB DETAILS

1. **Biomedical Equipment Lab**: 8 MHz Portable Ultrasound(USG) Machine(A scan and B scan), Ultrasound based CT Scan Trainer Kit, Electrosurgical trainer , Multi-parameter monitoring system(Bedside), Hemo dialyser trainer unit ,EEG and EMG trainer kit.
2. **Biomedical Transducer Instrumentation Lab**: Active and passive components, Transducer and sensors, NI ELVIS Biomedical LAB,NI LabView Hardware platform for Design and Prototyping, Digital Oscilloscopes, Signal Generators, pulse oximeter, BP sensor, oxygen sensor, PPG sensor.
3. **Anatomy and Physiology Lab**: Blood Cell Counter, Heart Rate monitor, Blood pressure monitor, Respiration rate monitor, ECG Simulator, Haemo cytometer, Haemo-meter, pH electrode.
4. **Biomedical Signal and Image Processing Lab**: LabView software, National Instrument High Speed DAQ card, Biopac MP 36 (Four Channel Data Acquisition) system.
5. **Microprocessor and Microcontroller Lab:** Basic Trainer Kits for Microprocessor and Microcontroller, Basic Trainer Kit for Interfacing Modules of Microprocessor and Microcontroller.
6. **Analog and Digital Electronics Lab**: Basic Trainer Kits for Analog Electronics and Digital Electronics, Trainer kits for Communication Lab.
7. **Anatomy and physiology Lab**: Please remove the existing instruments and add the following: Hemocytometer, Sahli's Hemoglobinometer, Mercury sphygmomanometer, Anti ABD grouping kit and automatic blood pressure device.
8. **Tissue Engineering :** Facilities in the lab: Laminar flow, class 2 Biosafety cabinet, CO2 incubator, -20 freezer, -80 freezer, Upright microscope, inverted fluorescence microscope, centrifuge, Sonicator, water bath, Cryo can, vortex shaker, variable inclined shaker, hot air oven, autoclave, hot plate magnetic stirrer, micro plate reader, 3D printers, Mimics innovation Suites, COMSOL MULTIPHYSICS, micro Viscometer, differential syringe pump, syringe pump, electro spinning system, Lyophilizer, CO2 Laser Cutter

DEPARTMENT OF BIOTECHNOLOGY

The Department of Biotechnology was setup in the year 2003 at NIT Raipur. The Department is one of the research-oriented departments of the institute. It has been offering academic programs in B.Tech and Ph.D. degrees and provides research insights to Ph.D scholars in all frontline areas of Biotechnology including Enzyme technology, biosensing devices, cell & molecular biology, drug discovery, drug delivery, drug design, advanced bioprocessing etc. Presently, the department is running various research projects sponsored by DST and DBT (Govt. of India).
Departmental webpage: http://nitrr.ac.in/aboutbiotech.php

⮚ Field of Expertise

Basic & Applied Microbiology, Biofuel, Bioremediation, Enzyme Technology, Biosensor development and alternative energy production, Antimicrobial resistance & drug discovery, Molecular biology & protein engineering, Genomics & Proteomics, Drug targeting & network pharmacology, Development of novel drug delivery system, Bio-process modelling & optimization, Drug design, Bio-process Engineering, Environmental Biotechnology, Biocatalyst & Bio-products, Medical/Industrial Biotechnology, Biochemical Toxicology, Microbial Biofilm, Tissue Engineering, Redox Nanomaterials & Biomaterials, Nanoplasmonics, Applied Biotechnology & Nanobiotechnology.

⮚ Research Projects

1. Design of Microbial Fuel Cell Integrated Microbial Electrolytic Cell Reactor and Study of its Structural and Process Parameter for Economics Production of Bio- Hydrogen by Electrohydrogenesis. Amount: 23,42,004.00 (DBT, Govt. of India)
2. To Explore Morphological Changes in Pathogenic Fungal Growth Before/ After Application of Potent Antifungal Amount: 8,00,000.00 (DBT, Govt. of India)
3. Experimental, Mathematical and Kinetic Modeling of Microbial Fuel Cell Process from the Waste Water. Amount: 42,94,800.00 (DST-SERB, Govt. of India)
4. Farbrication of Hemo- Filtration System Using Novel Ceramic Membrance to Develop a Portable Artificial Kidney, Amount: 26,88,800.00 (DST-SERB, Govt. of India)
5. Vibratory Shear Enhanced Filtration Process for Separation of Nanoparticles Synthesized by Microorganism Using Nanofiltration Flat Membrane, Amount: 26,79,000.00 (DST-SERB).

⮚ Testing facilities and major equipment available in the department

S. No	Name of equipment	Description of work
1	HPLC	Isolation, purification of Biologically active natural products, organic/inorganic compounds, detection of biogenetic Intermediates
2	Schrodinger Software	Drug designing, Drug targeting, Molecular docking, etc
3	Particle size analyser	Used to determine the size and distribution of particles

4	FTIR	Used for identification of organic, inorganic, and polymeric materials utilizing infrared light for scanning the samples
5	Double Beam UV-Visible Spectrophotometer	Used to identify and quantify intrinsic chromophores of proteins, RNA, DNA and other biological/organic compound
6	Lyophilizer	Used to improve the self-life, stability and storage of labile drugs and other biological compound
7	Bio-fermenter	Production of antibiotics, hormones, enzymes, sec metabolites
8	ELISA Reader	Used for protein/enzyme assay, diseases diagnosis, etc

DEPARTMENT OF CHEMICAL ENGINEERING

The department of Chemical Engineering came into existence in the year 1962 under the aegis of Government College of Engineering and Technology, Raipur (now National Institute of Technology Raipur, Raipur). The Department is offering undergraduate course (B.Tech in Chemical engineering) and one post-graduate course (M.Tech in Chemical Engineering). UG course (B.Tech in Chemical Engineering) was accredited by NBA for a period of 3 years till 30-06-2019.

- **Area of Expertise:** Semifluidization, Waste Water Treatment, Bioprocess Engineering, Chemical Sensors, Food Technology, Catalysis, Environmental Biotechnology, Process Design, Reaction Engineering, Waste Water Treatment Heat Transfer, Petroleum Refining, Solvent Extraction, Pyrolysis, Environmental Pollution Membranes, Reactive Separation, CFD, Food Science Process Intensification (Reactive Separation, Extraction, SFE), Nanotechnology (Bio-nanocomposite , Nano fluids),Bio Resource Technology & Alternate Energy (Pyrolysis, Bio-fuels) Wastewater Treatment (Electrocoagulation), Advanced Oxidation Processes (AOPs) for removal of persistent organic pollutants, Industrial Waste Water Treatment Methods, Advance Separation Process (Adsorption, Membrane & Biological) and Nanocomposites, Microelectronic Fabrication (CMP), Nanotechnology, Electrochemistry, Electrochemistry, Solar Cell Material, Nanotechnology, Environmental Engineering, Industrial Pollution Abatement, Adsorption, Pervaporation, Modelling and Simulation, Process Design, Pinch Technology, Computational Fluid Dynamics, Fluid Dynamics, Mixing Process, Turbulence,Chemical Mechanical Planarization, Nanotechnology, Corrosion science, Adsorption.

- **Research Projects:**

1. Kinetics of thermal degradation of chlorophyll green leafy vegetables and increasing the shelf life of the vegetables, Funding Agency- DST/SERB, Funded amount - 11,71,400/-
2. Intensification of downstream processing of citric acid using process intensification method (reactive extraction), Funding Agency- CGCOST, Funded amount - 2,00,000/-
3. Treatment of bio-digester effluents (BDE) of rice grain based industry, Funding Agency- CGCOST, Funded amount - 1,05,000/-
4. Combined novel biophysical treatment for heterogeneous wastewater pollutants, Funding Agency- SERB, Funded amount - 48,65,879/-
5. Electrochemical Deposition of CZTS for solar cell application, Funding Agency- DST-SERI, Funded amount - 27,44,000/-
6. Slurry formulation for ruthenium chemical mechanical planarization, Funding Agency- DST/SERB, Funded amount - 26,35,593/-
7. Practically-Viable heterogeneous Fenton catalyst and reuse of same catalyst in synthetic or industrial wastewater treatment, Funding Agency- SERB, Funded amount - 25,89,000/-
8. Synthesis of nano coated ceramic composite membrane for separation of green chemicals from technical lignin, Funding Agency- SERB, Funded amount - 25,35,500/-

9. Studies on a membrane reactor for the etherification of mono-carboxylic acids with ethanol, Funding Agency- DST/SERB, Funded amount - 25,20,000/-
10. One step CZTS nano ink synthesis by sonochemical route for bifacial solar cell application, Funding Agency- DST-SERB, Funded amount - 23,46,000/-
11. Shelf life of spices, Funding Agency- CGCOST, Funded amount - 5,00,000/-
12. Organic acids from sugarcane industry's byproduct, Funding Agency- CGCOST, Funded amount - 5,00,000/-
13. Interactive mechanism of green corrosion inhibitor and mild steal in alkaline medium containing chloride ion, Funding Agency- CGCOST, Funded amount - 4,28,000/-
14. Removal of dye and reduction of COD from dye bearing effluent, Funding Agency- CGCOST, Funded amount - 4,00,000/-
15. Effect of additives on germanium chemical mechanical planarization slurries, Funding Agency- IEI, Funded amount - 50,000/-.

- **Testing facilities available in the department**:

1. **Analytical Instrument**: The following instruments are in our department for analysis of samples.
2. HPLC, FTIR, Rheometer, Gas Chromatography, Particle Size analyzer (up to 0.02 micron), Atomic Absorption Spectroscopy, flame photometer, Contact Angle Analyzer, Open circuit potential (Max. 30 min), Potentiodynamic polarization study/Tafel study, Electrochemical impedance spectroscopy study, Cyclic voltammetry, Linear sweep voltammetry, Refractometer, UV-visible spectrophotometer.
3. **Product testing facilities**: The following product testing facilities are available in our department.
4. **Plywood & Pre-laminated Board**: Density, Moisture content, Resistance to dry heat, Fire resistance, Flammability test, Flame penetration test, Rate of burning test, Water resistant test, pH Value, Acidity and alkalinity resistance test, Formaldehyde Emission (Perforated Method), Mycological test
5. **Shutters & Doors**: Knife test, End immersion test
6. **Cement, Clay, Ash, Minerals, Refractory Materials & Ore etc**.: Bulk Density, Specific Gravity, Setting Time (for cement only), Chemical Analysis of Cement for the constituents-LOI, SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, Chemical Analysis of Cement for each Additional Components like IR, SO_3, Na_2O, K_2O, Chloride, etc.
7. **Coal:** Moisture (Oven drying), Free Moisture, Ash, Full Proximate Analysis, Volatile Matter, Methylene Blue Number, Iodine Absorption Value.
8. **TOC analyser** : All the organic compounds in water / waste water can be analysed.
9. **TGA (Thermogravimetric Analyser**): Thermal properties of solid (powdered) can be analysed.
10. **GC - MS** : To identify the chemicals present in the samples.
11. **Particle size / Zeta potential analyzer** - To measure the particle size / surface charge of a liquid sample.

- **List of Lab and Testing Facility**

S.No	Name of the Laboratory	Name of the Apparatus/Equipment	Name of the testing conducted	Commercial Applications/Compliance
1	Mass Transfer Lab	GCMS	Testing of samples of food, chemical and pharmaceutical (various numbers)	Analysis of several volatile and semi-volatile compounds: for the detection of several congenital components in trace level, presence of oils in ointments, creams, and lotions, detection of dibenzofurans, dioxins, herbicides, sulfur, pesticides, phenols, and chlorophenols in air, soil, and water, analysis of fatty acids, esters, aldehydes, alcohols, and terpenes present in food and beverages; in forensic toxicology to identify poisons and steroids in biological specimens; for the bioanalysis of body fluids to detect narcotics, barbiturates, alcohols, and drug; or the analysis of inorganic gases and aromatic solvents, detection of impurities and allergens in cosmetic
		GC	PhD works and gas sample analysis	
		Microwave system	PhD works on extraction of phytochemicals	Extraction studies on removal of non volatile components from samples using solvent extraction technology
2	PDC Lab / Research Lab	Particle and Zeta Potential Analyser	Determination of particle size, and surface charge	Nanotechnology field, Colloidal Science field
		Parstat	Electrochemical Workstation	Corrosion Study, EIS, Tafel, CV etc.,
		Contact angle analyzer	Surface property	Thin Films, Membranes etc.,
3	Chemical Reaction	UV-Vis Spectrophotometer	PhD works and liquid sample analysis	Investigation of concentration in terms of absorbance

	Engineering Lab	Probe Sonicator	PhD works and synthesis/extraction/dispersion	nanoparticle synthesis, cell disruption of microbes, extraction
		BET Surface Analyzer	PhD works and solid sample analysis	Single point powdered sample analysis to determine surface area and pore volume.
4	Advanced separation lab	HPLC	Chemical analysis of liquid samples	Analysis of chemical composition of various liquid samples
		Particle size analyser	measure the particle size and size distribution	Nanotechnological applications

DEPARTMENT OF CHEMISTRY

The Department of Chemistry has been functioning since inception of engineering college i.e. 1956. The department provides an outstanding research environment and offers academic programs leading to the award of Ph.D. degree. Apart from this department takes care of 1st year B.Tech. all branches and providing quality education in basic fundamentals of Applied Chemistry, Environment & Ecology, and Geochemistry Practical (M.Tech. Applied Geology).

- **Area of Expertise**: Organic Chemistry, Analytical Chemistry, Nuclear Chemistry, Environmental Chemistry, Nanotechnology & Luminescence, Drug designing & DNA binding, Synthesis and Characterization of Nanomaterials, Polymer Nanocomposite & Microcellular composite, Environmental Analytical Chemistry and water quality analysis, Synthesis of nanoparticles and its application in Various Field, Micro-extraction and Pharmacokinetic study of Drugs, Carbon dioxide sequestration, Biodegradable Polymers, Drug design of pharmaceutical importance, Synthesis of bioactive heterocyclic compounds, Crystal Engineering, Hydrogen Bonding-Applicable to solve the solubility and stability issues in organic and metallo-drugs, Supramolecular Chemistry, Carbon-dots, Biosensing, Soft nanocomposites, and Optical materials.

- **Research Projects**

1. Dr. Santhosh Penta, Design and synthesis of biologically relevance fused heterocycles via C-H activation / Oxidative cyclization / Tandem processes, Funding Agency- DST-SERB, Funded amount – 28.42 Lakhs, Year- 2019-2021.
2. Dr. Dinesh De; Dr.B. C. Sahu; Dr. RK Sahu; Dr. T Maharana; Functionalized Porous Framework Materials for Heterogeneous Catalysis; Funding Agency-TEQIP; Funded amount –Rs. 1634000 ; Year-18/06/2019 To 30/09/2020.
3. Dr. P. Y. Dhekne, Dr. S. P. Mahapatra and Dr. Santhosh Penta, Feasibility studies on removal of contaminants from surface and ground water of Bailadila iron ore mine project & peripherals, Funding Agency NMDC, Govt. Of India, Funded amount - 66.59 Lakhs, Year- 2018 to 2021.
4. Dr. K.A. Siddiqui, A Supramolecular Synthon Approach for Magneto-Structural Analysis of Hydrogen Bonded Metal-Organic Coordination Network, Funding Agency- CSIR, Funded amount - 10.00 Lakhs , Year- 2018-2021.
5. Dr. K. Tapadia & Co-PI: Dr T. Maharana, Spatial distribution of uranium and associated water quality parameters in groundwater / drinking water of six districts (Narayanpur, Kondagaon, Bijapur, Dantawada, Bastar, Sukma) of Chhattisgarh, Funding Agency- BRNS, Funded amount - 20.04300 Lakhs, Year- 2016 to 2019.
6. Dr. T. Maharana & Co-PI: Dr K Tapadia, Spatial distribution of uranium and associated water quality parameter in ground water / drinking water of five district (Bilaspur, Korba, Koriya, Mungeli & Surajpur), Funding Agency- BRNS, Funded amount - 26 Lakhs, Year- 2016 -2019.
7. Dr. K. Tapadia, Analytical studies of fluoride concentration and its removal from groundwater of Bastar region, India, Funding Agency- WSSO, PHED, (for three years), funded amount - 18.50 Lakhs, Year- 31-03-2014 to 31-03-2017.

8. Dr. T. Maharana, Synthesis and Characterizations of [O-,N,N,O] Based Bulky Schiff Base Metal Complexes and Their Catalytic Activity Towards Cyclic Carbonate Formation by Fixation of CO2, Funding Agency- DST, Funded amount - 24.5 Lakhs, Year- 2014 - 2017.
9. Dr. Santhosh Penta, Design and synthesis of novel potent heterocyclic compounds and their biological evaluation, Funding Agency- CGCOST, Funded amount - 4.95 Lakhs, Year- 2014-2017.
10. Dr. K.A. Siddiqui, Crystal Engineering and Supramolecular Synthon Approach for Assembly of Hydrogen Bonded metal Complexes, Funding Agency- DST-SERB, Funded amount - 17.88 Lakhs, Year 2014-2017.
11. Dr. A.K. Sutar & Co-PI: Dr T Maharana, Synthesis and Characterizations of Polymer Supported Based Bulky Schiff Base Metal Complexes and Their Catalytic Activity, Funding Agency- CSIR, Funded amount – 21.00 Lakhs, Year- 2013 - 2016.
12. Dr. T. Maharana & Co-PI: Dr A.K. Sutar, Synthesis and Characterizations of [O,N,N,O] Based Bulky Schiff Base Metal Complexes: Efficient Initiators for the Ring-Opening Polymerization of Lactide, Funding Agency- CSIR, Funded amount – 17.00 Lakhs, Year- 2012 to 2015.
13. Dr. A.K. Sutar & Co-PI: Dr T Maharana, Highly efficient metal initiators based on tridentate or tetradentate bulky Schiff base ligands for thering opening polymerization of lactide, Funding Agency- UGC, Funded amount - 10.69 Lakhs, Year- 2012 – 2015.
14. Dr. (Mrs.) F. Khan, Oxalohydroxamic acid is used as a partitioning agent in PUREX process of nuclear fuel reprocessing, Funding Agency- CCOST, Funded amount - 1.82 Lakhs, Year- 2012-2014.
15. Dr. K. Tapadia, Microextraction Analysis of toxicants in environmental and biological sample, Funding Agency- CCOST, Funded amount - 1.84 Lacs, Year- 2012 to 2014.
16. Dr. L Upadhyaya (PI), Dr. K. Tapadia (Co-PI), Chemical and Enzymatic modification of NSAID to overcome their side effect, Funding Agency- CGCOST, Funded amount - 2.00 Lakhs, Year- 2012 to 2014.
17. Dr. S. Agrawal, Dr. S. P. Mahapatra, Preparation and Characterization of Microcellular Elastomer Nanocomposites for Packaging and Semi-conducting Applications, Funding Agency- CGCOST, Funded amount - 2.00 Lakhs, Year- 2012 to 2014.

- **Testing Facilities available in the Department**:

Department is well equipped with advance equipment and softwares:

1. Rheometer for rheological and thermo-mechanical studies of samples.
2. Potentiostat / Galvanostat to study of reaction mechanisms in electrochemistry.
3. FT-IR Spectrophotometer for detection of functional groups of organic compounds.
4. Fluorescence Spectrophotometer for detection of fluorescent organic substance.
5. Atomic Absorption Spectrophotometer for detection of metal ions.
6. UV-Visible Spectrophotometer for detection of metal ions.
7. LCR Meter for Permittivity, Conductivity and Impedance analysis.
8. Fluorometric determination of Uranium ion in the sample.

9. Gaussian Software for Computational Chemistry.
10. MestReNova Software for NMR data analysis.

DEPARTMENT OF CIVIL ENGINEERING

Civil engineering is considered to be the backbone for all type of developments. The Department of Civil Engineering at NIT Raipur (erstwhile, Government college of Engineering and Technology) is producing high quality technical manpower; required by various industrial establishments, R&D organizations, Govt. & public establishments and academic institutions since 1958. Civil Engineering involves the application of scientific principles and knowledge of mathematics, theory of mechanics and application of computers to the planning, analysis, design and construction for all type of infrastructures.

The Department offers B Tech degree in Civil Engineering and M Tech degree in Civil Engineering with specializations in Water Resources Development & Irrigation Engineering and Structural Engineering. The Department has been offering Ph.D. program in various specializations. The Department also encourages its students to engage in extra-curricular and co-curricular activities, essential for development, nurturing of team spirit, and developing organizational skills. The faculty members of the department are involved in research and consultancy activities, and they continue to enjoy academic leader role in the country. Govt. of India has recognized Civil Engineering Department as State Technical Agency for implementation of its ambitious projects of Pradhan Mantri Gram Sadak Yojana (PMGSY) & National Rural Drinking Water Programme (NRDWP).

- **Area of Expertise:**

  Structural Engg / Mechanics of Solids, Mechanics of Composite Materials, Finite Element Modelling, Earthquake Engineering, Water Resources Engg / Fluid Mechanics, Hydrology, Water Resources Engg, Structural Engineering/Structural Engg., Non- linear Analysis, Finite Element Analysis, Earthquake Engineering, Soil-Structure interaction, Transportation systems, Rural Roads, Environmental Engineering/ Water, Wastewater Treatment, Environmental Management, Airpollution Monitoring & Modelling. Solid Waste Management, Structural Engg / Structural Engg. , inverse problem, System Identification, Structural Health Monitoring, Damage Detection, Computational Mechanics, Environmental Engineering / Air Pollution Monitoring, Water/Waste Water Treatment, Industrial Waste Treatment, Structural Engg/ Concrete Technology, Fly ash & Marginal Materials, Fibre reinforced concrete, High voiume.fly ash concrete, Geotechnical Engineering/ Soil structure interaction, Rock Engg. 9Geotech Engg. Slope stability, foundation Pavement materials, Water Resources Development & Irrigation Engg/ Stochastic Hydrology, Surface Water Resources, Application of Remote Sensing & GIS in Water resources, Rainfall – Runoff Modelling, Water Resources & Environmental Engg./ Fluid Mechanics water Resources Engineering urban water distribution system Hydrology optimization techniques, Structural Engg./Matrix analysis of structures, Wind Effect on high rise structures, Seismic Engineering, Structural Engg./ Waste management in cement and concrete construction. Characterization of raw materials of cement and concrete. Optimization in cement and concrete, Structural Engg./ Structural Dynamics seismic Base Isolation Geotechnical Earthquake Engineering Earthquake protection of Buildings Structural Analysis of Buildings, Transportation Engineering & Planning/ Mechanistic-Empirical Pavement Design, Performance evaluation of pavements using NDT methods, Highway traffic, Geotechnical Engineering/ Soil stabilization, Geotechnical Engineering, Geo-

environmental Engineering, Ground Improvement Techniques, Constitutive Modeling, Geotechnical Engineering.

- **Research Projects:**

1. Improving soft sub-grade for the construction of low volume roads using locally available marginal materials, Funding Agency- Chhattisgarh Council of Science & Technology Raipur, Funded amount - 2,00,000.00
2. Environmental performance assessment of major city of Chhattisgarh based on green city index, Funding Agency- Human Settlement Management Institute, Funded amount - 23,49,200.00
3. Study of flood on Mahanadi river, Funding Agency- Revenue & Disaster Management Dept., C.G. Govt, Funded amount - 5,00,000.00
4. Construction of low volume roads on soft subgrade soil improved by locally available marginal materials, Funding Agency- Human Settlement Management Institute, HUDCO, New Delhi, Funded amount - 25,00,000.00
5. Parametric study of eco- friendly concrete/ composite by partial replacement of sand and cement with locally available industrial by products, Funding Agency- Chhattisgarh Council of Science & Technology, Funded amount - 4,02,000.00
6. Monitoring of fluoride in underground water of Jagdalpur distrct of Chhattisgarh and its removal, Funding Agency- Chhattisgarh Council of Science & Technology, Funded amount - 3,29,000.00
7. Study of the pollutants released during open burning of municipal solid waste, Funding Agency- Chhattisgarh Environmental Conservation Board, Funded amount - 20,90,758.00
8. Performance evaluation of some selected PMGSY roads in the state of Chhattisgarh, Funding Agency- National Rural Roads Development Agency, Funded amount - 41,89,000.00
9. Digital change detection for better natural resources management., Funding Agency- Research Seed Grant Project, Funded amount - 5,00,000.00
10. 10, Design and Validation of existing bike based patient carrier transport system for remote areas of Chhattisgarh and proposing design of bike-trailer assembly , Funding Agency- United Nations Children's Fund , Funded amount - 10,00,000.00

- **Testing facilities available in the department:**

Department is well equipped with advance equipment and software's available in various laboratories.

- **Software's**: AutoCAD, Bentley's Software package (STAAD Pro, STAAD Foundation, MX Road, MicroStation, Bridge Master, Water Gems, Storm CAD, etc.), ANSYS, SAP, NISA, ArcGIS, Visual Modflow, SMS, WMS, ERDAS Imagine, ADOPT etc.
- **Equipments**: Universal Testing Machine, Plate Load test, Triaxial Test, Consolidation Test, Swell Pressure Apparatus, Los Angles, Devels, Impact, Ductility Test Machines, Hydraulic flume, Turbines, Differential Global Position System (DGPS), Total Station, Non-Destructive Testing,

Cyclic Triaxial, Universal Triaxial, Digital Direct Shear, UV Visible Spectrophotometer, Atomic Absorption Spectrophotometer, etc.

- **Testing Facilities:**

Test on physical and mechanical properties of building stone, test on cement concrete tiles (terrazzo or mosaic & other), tests on hollow cement concrete block, tests on timbers, testing of bricks, testing of building limes, testing of cement, testing of aggregates, test on bitumen and bituminous concrete, testing of concrete piles, test on water sample, test on sewage & industrial waste, test of shutters and doors, surveying, testing FRP sheets, test on soils, free swelling index, preparation of soil sample for triaxial test, plate load test, swelling pressure test, field cbr test, resilient modulus test, tensile strength test of geosynthetics/geogrid, puncture test of geosynthetics/geogrid, weight per meter length, diameter of deformed bars, bend test, rebound test, ultimate tensile strength test, percentage elongation test, rebound hammer test on concrete, ultrasonic pulse velocity, half-cell potentiometer, electrical resistivity, testing of rheological parameters, shrinkage of cementation material), testing of highway material, conduction of terrestrial survey, assessment planning & development of water resources, restoration of ponds & lakes etc.

DEPARTMENT OF COMPUTER APPLICATIONS

The Department of Computer Applications is one of the pioneer department of the institution that offers Post Graduate Courses as Master of Computer Applications (MCA) and Research Program as Ph.D. in Computer Applications. The department of Computer Applications is one of the oldest department of theinstitute since its inception in 1988 with an initial intake of 30 students. Students are admitted to the MCAProgram through all India national level entrance examination NIMCET (National Institutes Master of Computer Applications Entrance Test) conducted by any one of the participating Institutes. Presently theMCA Program is having an intake of 110 Seats.

The Ph.D. Program started in 2011. Admission to Ph.D. Program is on the basis all India national levelentrance examination conducted by NIT Raipur followed by interview. As on date 7 Research Scholars have been awarded Ph.D. in Computer Applications.

The Objective of the course is to provide quality education in the field of computer applications in cooperating good theoretical foundation through high-quality teaching complemented by extensive practical training approach. This same objective with publication in reputed national / international journals and national / international conferences etc. and making research for the benefit of mankind is opted in the research program of computer applications. The alumni of this department are serving in India and abroad on top and reputed position in many organizations.

Presently the department is enriched with 11 faculty members, who pose vast industrial as well as academic experience actively involved in teaching, research and in deployment of Research & Development projects apart from institutional administrative work. The faculty members have significantly contributed towards scientific arena in form of standard publications in international/national journals (SCI Scopus etc.) and conferences. The department is also providing extensive industrial training and organizing expert lecturesfocusing on emerging technologies for the benefit of both student and faculty.

Apart from focusing on consistent and good academic performance, the department encouragesparticipation in the co-curricular and extra-curricular activities among the faculties and students throughthe various schemes and programs of MHRD and GoI as NCC, NSS, Hindi Diwas Celebration, Unnat Bharat Abhiyan (UBA), Swachhta Abhiyan, Ek Bharat Shrasth Bharat, Matri Bhasa Diwas etc. along with the various clubs as Click Club for Photography, Raga Club for Music etc. and Chapter of various International / National societies as ISTE, IEEE of NIT Raipur.

v Area of expertise:

Parallel Processing, AI and Machine Learning, Cloud Computing, Mobile Computing, Computer Network, Operating Systems, Cryptography and Network Security, Data Science, Data Mining, Image mining, Internet of Things, Digital Literacy, Decision support system, Metaheuristics technique for combinatorial optimization problems, Network optimization, Information Security, Cyber Security, Android, Java, NLP, Text Analysis, Adversarial Attack using Machine Learning, Pattern Recognition, Evolutionary Techniques for Financial Time Series Prediction, Software Engineering, ComputerArchitecture, Distributed Systems.

V Details of the Research and Development Project.

Theme:- Metaheuristic Techniques for NP- Hard Spanning Tree Problems - finding its application in Telecommunication, VLSI Design, Electrical Circuit Design, Linear Light Wave Networks (LLNs), Road Systems etc; Benchmark evaluation of JPEG forensics scheme (s) - to help forensic laboratories and forensics experts to identify secure forensics methods for automatic evaluation of any suspect image; Design of an algorithm for improving robustness of power grid controller under cyber- attack scenario.Medical effect of performing meditation to improve quality of life - addressing of heart rate variability using linear or non-linear methods; Cloud-enabled connected sensor based weather monitoring and Prediction System; Cloud-enabled connected sensor based irrigation monitoring and Prediction System; Cloud-enabled SMS/GPRS based monitoring of environmental sensors.

Status:- Five Projects are completed and Four are going on, Amount for Completed Projects:- 67.59 Lacs (Approx), Amount for On Going Projects:- 70.40 Lacs (Approx), Funding Agency:- SERB- DST New Delhi, MeitY, DST – ICPS, SERB.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

The Department of Computer Science & Engineering was established in the year 2000. The department offers high quality undergraduate and doctoral programs. The degrees offered by the department include B.Tech (Bachelor of Technology) and Ph.D. (Doctor of Philosophy in CSE). Currently, the B. Tech (Computer Science and Engineering) program with an intake of 102 students. The Department provides an outstanding research environment complemented by superior teaching for its students to flourish in. The department has distinguished and committed faculty members with PhD from reputed institutes. The Department boasts of highly qualified faculty who are active members of reputed National and International societies. They are instrumental in the research publications and in reviewing papers in many leading journals. The department has carried out active research in different fields of computer science and engineering. In addition to regular academics, the department undertakes R&D and consultancy projects. The department is also providing extensive industrial training, organizing faculty development program, conferences and expert lectures focusing on emerging technologies.

v Area of Expertise:

Deep Learning, Machine Learning, Database Systems, Evolutionary Computing, Big Data, Data Analytics, Deep learning, Computational Intelligence, Data Mining, Text Mining, Software Engineering, Data Science, Applications of Soft computing techniques, Web mining, Distributed System, Wireless sensor Networks, Internet of Things, Mobile Ad-hoc Network, Information Security, Blockchain, Cryptography, Authentication, Distributed, Grid and Cloud Computing.

v Research Projects:

1. Dr. Pradeep Singh**,** Development Of a Comprehensive Model for Software Fault Prediction, Date of Award: - 2013, Funding Agency: - CCOST, Amount in lakhs of Rs. 5 Lacs, Status: -Completed.

2. Dr. Naresh Kumar Nagwani, Predictive and Visual Analysis of the Price Distribution Information of Rice and Wheat across India. Date of Award: - 2013, Funding Agency: - CGCOST Raipur, Amount in lakhs of Rs. 4.50 Lacs, Status: - Completed.

3. Dr. Naresh Kumar Nagwani, Development of Framework for web Based Intelligent Dictionary for Learning Chhattisgarhi Language Date of Award: - 2015, Funding Agency:- CGCOST Raipur, Amount in lakhs of Rs 4.00 Lacs, Status:- Ongoing.

4. Dr. Dilip Singh Sisodia, Modelling of autonomous software agents' behaviour to defend HTTP request attacks. Date of Award: - 2015, Funding Agency :- CGCOST Raipur, Amount in lakhs of Rs. 4.90 Lacs, Status: - Completed.

v Laboratory Facility:

Department of CSE has several well-equipped computer laboratories with 100 computers and 10 workstations to cater the needs of CSE students. The present infrastructure is excellent to carry out research and other academic work by UG and PhD students. Department uses a number of software's

available centrally at NIT Raipur like MATLAB, .Net, SPSS and many numbers of open source software's to carry regular academic and research works.

Three instructional labs:

i. Project Lab (40 PC)
ii. Advance Lab (40 PC)
iii. Research Lab (20 PC)

v Advanced Research Facility and Research Lab

S. No.	Item	Item Configuration	Quantity
1	HPZ 620 Workstation	8GB RAM, 1TB HDD, Intel Xeon Processor, Win 10	7
2	Lenovo ThinkStation Intel Xeon Workstation	32GB RAM, 1TB HDD, Intel Xeon Processor , Win 10	10
3	Tyron workstation	128GB RAM, 4TB HDD, Intel Xeon Processor, Win 10	6
4	Tyron workstation	128GB RAM, 4TB HDD, Intel Xeon Processor, Win 10	2
5	SuperMicro Fusion Workstation	128GB RAM, 4TB HDD, Intel Xeon Processor, Win 10	2
6	Dell Precision 5820 Tower Workstation	128GB RAM, 4TB HDD, Intel Xeon Processor, Win 10	1
7	Dell Precision 7920 Tower Workstation	128GB RAM, 4TB HDD, Intel Xeon Processor, Win 10	1
8	Dell EMC Power Edge GPU Server	128GB RAM, 4TB + 4TB HDD, Intel Xeon Processor, Win Server 2019	2
9	IOT Development Tool and Scratch Module	Includes various sensors and microcontroller etc	1

v Facilities available in the department

- **Hardware Testing**: -
    - Hardware configuration, determination for equipment.
- **Software development and Consulting**:
    - Data Science Consulting with Artificial Intelligence and Machine Learning. Data Analytics Consulting Services, Business Intelligence Consulting Services, AI based software Development, IOT based development.

DEPARTMENT OF ELECTRICAL ENGINEERING

Electrical Engineering Department was established in 1958 in erstwhile Govt. College of Engineering & Technology Raipur (presently NIT Raipur). The Department runs UG, PG and PhD programs (01 each). The department has 23 motivated faculty members (18 regular and 5 on Contract) having expertise in varied domains such as: power system, control system, electric drives, instrumentation & control etc. Department aims at imparting the state-of-the-art knowledge and skills to the students. Thus, developing them into excellent Electrical Engineers, Entrepreneurs, Scientists, and Academicians.

v Domain Expertise of Department Faculty:

The faculty members of the department are highly qualified with PhDs from various reputed organizations such as IITs, NITs etc. In addition, the faculty members are actively engaged in research and consultancy activities in various domains such as:

1. Power Systems, Power Quality, Integrated Power System, Power System Protection, Power System Planning & Management, Microgrid and Smart Grid, Artificial Intelligence Application in Power System Protection.
2. Renewable Energy Systems, Grid-Tied PV Inverters Design, Power Electronics, Power Converters and Inverters, Power Electronic Circuit Design, Switched-mode powers supply systems, Hybrid Renewable Energy Systems and Distributed Generation.
3. Electrical Machine & Drives, Advanced Electric Drives, Electric Vehicles, Electric Transportation Systems, Electric Heating and Cooling.
4. Measurement & Instrumentation, Control Systems, Signal & Image Processing, Biomedical Engineering, Medical Instrumentation, Speech Signal Processing, Machine Learning, Soft Computing Techniques, Pattern Recognition.

v Research Projects (Last Six Years):

1. Dr. (Mrs.) S.Gupta, Design of Microbial Electrolytic Cell for economic and energy efficient bio hydrogen production from leafy biomass by electrohydrogenesis, Funded amount-37.61Lakhs, Funding Agency- MNRE, Year-2015.
2. Dr. Subhojit Ghosh & Dr. Susovon Samanta, Hydrid optimization based fraction order fuel modeling and online parameter estimation with design of adaptive controller for integrated power converters:-3years, Funded amount-34.79Lakhs, Funding Agency-NRB, Year-2015.
3. Dr. N.D.Londhe, Development of Efficient Devanagari Script Input Based P300 Speller System for Brain-Computer Interface:-3years, Funded amount-27.10Lakhs, Funding Agency- MNRE, Year-2016.
4. Dr. Anamika Yadav, Studies to Improve the Performance of Fault Location Algorithm for Multi- Location Shunt Faults in Transmission Line: A Case study of Chhattisgarh

State.:-3years, Funded amount-27Lakhs, Funding Agency- CPRI, Year-2016.

5. Dr. Anamika Yadav, A single ended directional relaying algorithm based on ANN for fault classification and zone identification of double in feed transmission line, Funded amount – 4.40 Lakhs, Funding agency – Chhattisgarh Council of Science and Technology, CGCOST, Raipur, Completed year- 2017
6. Dr. Subhojit Ghosh, Development of circuit Based Model for the Analysis of Glucose Regulation System:-3years, Funded amount-4.8Lakhs, Funding Agency- SERB, Year-2017.
7. Dr. Vinay Pratap Singh, Derivation of time Moments and Markov Parameters and their Applications in Model Reduction of Discrete interval System:-3years, Funded amount-15.25Lakhs, Funding Agency- SERB, Year-2017.
8. Dr. Lalit Kumar & Dr. Shubhrata Gupta (Co-PI), Development of Single- Phase Fault Tolerant Topology of Multilevel Inverter with Reduced:-3years, Funded amount-43.54Lakhs, Funding Agency-DST-SERB, Year-2017.
9. Dr. N.D.Londhe Machine Based Behavioural Multiparametric Pain Assessment System:-3years, Funded amount-23.56Lakhs, Funding Agency-DST-SERB, Year-2018.
10. Dr. (Mrs.) S.Gupta & Dr. Lalit Kumar, Design & Development of Low Cost Single Phase Fault Tolerant Multilevel Inverter Topology:-3years, Funded amount-23.56Lakhs, Funding Agency- SERB, Year- 2018.
11. Dr. (Mrs.) S.Gupta, Design of Microbial Fuel Cell Integrated Microbial Electrolytic Cell Reactor and Study of its Structural and Process Parameter for Economics Production of Bio-Hydrogen by Electrohydrogenesis, Funded amount- 23.42Lakhs, Funding Agency-DBT, Year-2018.
12. Dr. S.Ghosh, Dr. T.K.Das & Dr. E.Koley, Detection of Data Attacks and Design of a Resistance Mechanism in Smart Grids, Funded amount-66.47Lakhs, Funding Agency-SERB, Year-2019.
13. Dr. R.N.Patel & Dr. Lalit Kumar Sahu, Design and Development of Multiple Input Power Electronic Converters for Solar Photovoltaic Panels, Funded amount-31.24Lakhs, Funding Agency-SERB, Year- 2019.
14. Dr. A.Yadav, Design and Development Computational Intelligence based Fault Classification and Location scheme, Funded amount-14.17Lakhs, Funding agency-NPIU-MHRD, Year 2019.
15. Dr. S.Ghosh, Dr. T.K.Das, and Dr. E.Koley, Detection of Data Attacks and Design of a Resistance Mechanism in Smart Grids, Funded amount-69.50 Lakhs, Funding Agency-DST, Year- 2020.
16. Dr. Sachin Jain, Dr. S.Ghosh, and Dr. R.N.Patel, Ensuring the Optimum Utilization of Solar Water Pumps in Rural Chhattisgarh, Funded amount- USD 73,162/-, Partnership

2020: A Collaborative Project of University of Nebraska at Omaha (UNO) and US Department of State (DOS), Year - 2020.

17. Dr. Varsha Singh, Dr. Swapanjit Pattnaik, Design and development of photo-voltaic interface compact single phase multi-level inverter using wide band gap devices, Funded amount-25lakhs, Funding agency- HEFA, CSR Year-2021.
18. Dr. N. D. Londhe, FIST- PROJECT (Level I), Funded amount- 1,0800000/-, Funding Agency- DST, Year-2020..

- **Testing facilities available in the department:**

S.no.	Name of equipment	Testing rate proposed
1.	Electric Motor ®Upto 5 H.P. ®More than 5 H.P. upto 10 H.P. ®Above 10 H.P & upto 15 HP ®above 15 HP	Rs.2000 each Rs.2000+Rs 1000 Rs.12000/- RS.12000+2000 per HP (above 15 HP)
2.	Welding Transformer: ® Upto 5 KVA ® Above 5 KVA upto 15 KVA ® More than 15 KVA upto 20 KVA	Rs.2000/- Rs.2000/-+ Rs.200/-Per KVA (above 5 HP) Rs. 6000/-
3.	Energy Meter ®3 Phase ®1 Phase	Rs.4000/- Rs.1000/-
4.	Testing of CTS ®3 No's ®1 No's	Rs.2000/- Rs.1000/-
5.	High voltage test for higher voltage cables (DC and Power frequency test)	Rs.2000/-
6.	(a) Resistance Test of cable ® Single core ® Three core	Rs.2000/- Rs.4000/-
7.	H.V.test of transformer per sample (break down voltage test) Minimum 2 samples (Top & Bottom oil)	Rs.600/-
8.	Testing of instruments /meters ® Voltmeter ® Ammeter ® Wattmeter ® Megger ® Earth Tester	Rs 330/- each. Rs 330/- each. Rs 660/- each. Rs 660/- each. Rs 660/- each.

	® Calibrations of Multimeters	Rs 2000/- each.
9.	Transformer ® tan delta test at 90^0 ® Resistivity test at 27^0C ® Resistivity test at 90^0	Rs.1200/- each Rs.1600/- each Rs.1600/- each

- **Consultancy Activities (Last 2 Years):**

  - Vetting of Electrical Drawing/Specification of the work in connection with redesigning and augmentation of electrical power system at AIIMS Raipur. (Part- A)
  - Vetting of Bill of Quantities and Schematic Drawings of PLC and Electrical panels for Roshni-I MVRWSS, Dist: Khandwa, Madhya Pradesh Jal Nigam aryadit, Bhopal
  - Vetting of Electrical Drawing/Specification of the work in connection with redesigning and augmentation of electrical power system at AIIMS Raipur. (Part- B)
  - Inspection for the increase in Capacity of Turbo Generator Set from 10 MW to 12 MW, API ISPAT & POWERTECH (P) LTD., Phase- II, Siltara Industrial Area, Raipur, Chhattisgarh- 493111

- **List of lab and Testing Facility**

S. No	**Name of Laboratory**	**Name of Apparatus / Equipment**	**Name of Testing conducted**
1	Machine Lab	Current transformer, Energy meter kit, Inductive and resistive load, C>T. testing kit	CT, Energy meter, AM-Meter, Multi meter
2	High Voltage lab	Oil Testing kit, High voltage kit	Oil Testing, Cable Testing, High voltage tester
3	Electronics Lab	Resistance Kit	Megger, Earth Tester
4	Measurement Lab	Potential Transformer	Volt Meter

DEPARTMENT OF ELECTRONICS & COMM. ENGINEERING

The Department of Electronics & Communication Engineering has been playing a vital role in producing scientists and technologists of highest calibre ever since it was established in the year 1985. The department runs one under graduate program and 1 post-graduate program as of now.

The infrastructure and lab facilities are upgraded from time to time and provide adequate opportunities for students and researchers to learn and innovate. The department has distinguished faculty, all holding Ph.D. degrees from renowned institutes. The faculty of the department has been constantly carrying out research on many cutting-edge technologies and regularly publishes in IEEE and other top international journals. The department also undertakes research projects sponsored by both the government and the industry. Following are the details of the faculty count and their area of expertise.

1. Area of Expertise: Digital system design, image processing, computer & communication networks, distributed processing, Semiconductor device modeling and simulation, Digital Communication, Wireless Sensor Network, Artificial Intelligence, Cryptography & Network Security, Signal Processing, Mobile Communication, Soft Computing, Distributed source/channel coding, Error correction codes, Digital system design, Microwave and antennas, Multimedia Security/Forensics, ComputerVision, Image/Video Processing, DSP filter design, Soft computing, Antenna & Microwave Engineering, Microstrip & Dielectric Resonator Antennas, Superjunction power devices, High k power devices, SiCpower devices, strain effect on power devices.

2. Research Projects

1. Prof. Dr. S. Verma (PI) & Dr. B. Acharya (Co-PI), Title: Special Manpower Development Project Chip-to-System Design, (SMDP C2SD), Funding Agency:MeitY, Govt. of India, Amount:96 Lakh
2. Prof. Dr. S. Verma (PI), Title:Design & development of dynamically controlled walker system, Funding Agency:DST, Amount:23.12 Lakh
3. Prof. Dr. S. Verma (Co-PI), Title:Development of compressive model for software fault prediction, Funding Agency:Chhattisgarh council of science & technology, Amount:5 Lakh
4. Prof. Dr. S. Verma (Co-PI), Title:Predictive & visual analysis of the price distribution information of rice & wheat across India, Funding Agency:Chhattisgarh council of science & technology, Amount:4.5 Lakh
5. Dr. B. Acharya (PI) &Dr. A.S. Raghuwanshi (Co-PI), Title: Information Security Education and Awareness (ISEA) Phase II, Funding Agency:MeitY, Govt. of India, Amount: 36.06 Lakh
6. Dr. ToshanlalMeenpal (PI), Title:Design and development of an Automatic Kinship Verification system for Indian faces with possible integration of AADHAR Database, Funding Agency: SERB, Dept. of Science and Technology (DST), Amount: 25 Lakh
7. Dr. Toshanlal Meenpal (Co-PI): Title: Design of JPEG Anti-Forensics Scheme(s) for evaluation of existing JPEG forensic schemes, Funding Agency: MeitY, Govt. of India, Amount: 28 Lakh
8. Dr. S.K. Saha (PI), Title: Detection of QRS complex of ECG signal using optimally designed pre-processor and it's online testing, Funding Agency: SERB, Dept. of Science and Technology (DST), Amount: 29.32 Lakh

9. Dr Ajay Singh Raghuvanshi, (PI), Title: Integrated Renewable Resources and Storage: Operation and Management [IReSOpM], Funding Agency: Jointly funded by the Department of Science and Technology (DST) for the Indian side and the Research Council of Norway (RCN) for the Norwegian side. Amount: Rs 46,52,760 (India side)

3. Testing facilities available in the department

- **Hardware Testing**: -
  - Hardware configuration, determination for equipment (BELARC Testing).
  - In house Single sided PCB making and Testing.
  - Testing of Microwave Components using Vector analyzer.
  - Microwave Test kit for testing of active and passive components

- **Software Testing:** -
  - Analog and mixed Signal design and verification.
  - VERILOG and VHDL based digital circuit design and verification.

DEPARTMENT OF HUMANITITES & SOCIAL SCIENCES

The Department of Humanities and Social Sciences (HSS), NIT Raipur was established in the year 1958 (formerly, the Department of English under the Government College of Engineering and Technology). The Department of HSS is presently one of the emerging departments, which is home to research and teaching in the field of sociology, psychology, value education, English literature, theatre, music, yoga and linguistics.

The department largely works with the B Tech. students and helps them develop verbal and non-verbal communication skills, establish an understanding on the role of values in education, critically analyse the social issues, explore modern Indian and British English literature, conceptualise neurocognitive aspects of language, music and emotion, and work on their physical and mental well-being. Such an approach towards educating the prospective engineers has furthered their empowerment and also their holistic development.

The department has 08 full time faculty, 02 temporary faculty and 01 teaching assistant from diverse backgrounds and specializations. The department offers PhD program in the various fields of social sciences and humanities.

- **Area of expertise**

  Business communication, corporate communication, interpersonal leadership, soft skill, cultural competence, sustainable marketing (advertising), consumer psychology, SDGs, entrepreneurship & amp; innovation management, IPR, literature, cultural studies, linguistics, transnational studies and regional literature, human rights, ELT, yoga & health and value education.

- **Research Details**

  1. Dr. Jaya Dwivedi, Funding Agency- SCERT-Govt. of Chhattisgarh, Funded amount 60,000/-, Innovative Approaches to Develop Communication Skill of Student of Govt. Boys Middle School Nardaha, Arang, Raipur.

  2. Dr. Shashikanta Tarai, NITRR/Seed Grant, 5 lakh, Mindful yoga practice enhances attentional mechanisms and modulates cognitive control: A behavioural and neurocognitive study with engineering students in Chhattisgarh.

  3. Dr. Sandip Sarkar, NITRR/Seed Grant, 4 lakh, Flows, Boundaries and Hybrid: Tracing the Tune of Rationality in the Folk Song and Music Video of Chhattisgarh and Bengal.

  4. Dr.Y.V. Babu, NITRR/Seed Grant, 3.95 lakh, An Empirical Study on the Contextual Relevance of ICT- CALL Modules and its Role in Promoting Employability Skills Among Engineering Students in Chhattisgarh.

5. Dr. Moksha Singh, NITRR/Seed Grant, 5 lakhs, Children in conflict: A study on the rehabilitation process in Chhattisgarh.

- **Laboratory**

The Department has state of the art multimedia language laboratory, which is equipped with latest technical advancements. The laboratory has been used extensively for enhancing the communication skills of the students.

DEPARTMENT OF INFORMATION TECHNOLOGY

Departmental faculties have good expertise in different domain knowledge of Computer. The department provides testing facility of different software and hardware. Faculty members are also expert in decomposition of problem and solve with help of computer. Faculty members can help to different software organization to solve their problems.

- **Area of expertise:**

  Computer Organization, Computer Networks, Cellular and Mobile computing, Artificial Intelligence, Digital Image Processing, Machine Learning and Soft Computing, Mobile-Adhoc Networks, Sensor Networks, Mobile Computing, Genetic Algorithm, Computer Architecture, Data Mining and Analysis, Machine Learning, Text Mining, Social Mining, Computer Vision, Image Processing and Analysis, Bio Medical Data Analysis, Data Mining, Machine Learning, Design of Algorithms, 5G Communication, Computer Network, Distributed & Cloud Computing, Robotics & Artificial Intelligence, Soft Computing, Machine Learning, Artificial Intelligence, Image Processing, Networking, Wireless Sensor Network, Parallel & Distributed Computing, Algorithms, Big Data Processing.

- **Research and Consultancy, Sponsored Research Projects**

  1. NITRR/ RP/IT/2015/052 : "Development of Framework for web Based Intelligent Dictionary for Learning Chhattisgarhi Language", Year- 2015-2017, Funding Agency- Chhattisgarh Council of Science and Technology, Funded amount - 4 Lac

  2. NITRR/RP/ IT/2018/ 111 To Propose an Optimize Resource Allocation Schemes Framework for Device Tier Communication for 5G Cellular Networks, Year- 2018-2021**,** Funding Agency- Science & Engineering Research Board (SERB), Funded amount - 14.75 Lac

  3. Design and Development of Customized Welding Robot for Industrial Applications, Year- 2018-2020, Funding Agency- Shanta Techno Pvt. Ltd., Funded amount - 3.96 Lac

  4. Design and Development of Dynamically Controlled Walker System"/SEED Division, Year- 2014-2017, Funding Agency- Dept. Of Science and Technology, Funded amount - 23, 12, 460.00.

- **Laboratory Facility**:

  Department of Information Technology has several well-equipped computer laboratories with 183 computers and 16 workstations to cater the needs of IT students. The present infrastructure is excellent to carry out research and other academic work by UG and PhD students. Department uses a number of software's available centrally at NIT Raipur like MATLAB, .Net, SPSS and many numbers of open-source software's to carry regular academic and research works.

Four instructional labs:

1. Internet Lab (55 All in One PC)
2. Network Lab (50 All in One PC)
3. Computer Lab (53 All in One PC)
4. M.Tech Lab (25 Desktop PC)

4. Advanced Research Facility in Labs

S.NO	Workstation	Configuration	Quantity
1	HP	HP Z420 , OS: Win-7 64 bit, Intel Xeon® processor 3.60 GHZ, RAM: 4 GB DDR3, HDD: 500GB, CD-RW	4
2	Dell	OS: Win 10, Precicion 5820 Tower, Processor 3.6 GHZ, RAM: DDR4 64 GB, CD-RW	2
3	Lenovo	Thinkstation P-520 Processor: Intel Xeon 2.5 GHZ RAM: 128 GB, HDD: 2TB	4
4	Super WS	OS: Win 10, Intel Xeon E5 RAM: 128 GB, HDD:2 TB	2
5	Fusionstor	Invanto i7214 purely series OS: Win 10, Processor: Intel Gold 6248, SSD 1TB, Grapics Card RT*5000	1
6	Tyrone	Invanto i7214 purely series, OS: Win 10, Processor: Intel Gold 6248, SSD 1TB, Grapics Card RT*5000	1
7	Tyrone	OS: Win 10, Intel Xeon 6240 R Processor-128 GB 3 GHZ, SSD 1TB	2

- **Facilities available in the department**
  - **Hardware Testing: -**

    Hardware configuration, determination for equipment

    Software development and Consulting: Data Science Consulting with Artificial Intelligence and Machine Learning. Data Analytics Consulting Services, Business Intelligence Consulting Services, AI based software Development, IOT based development.

- **Benchmark**

1. NetSys-T
2. Network Security Training System (I-Securit)
3. LAN Trainer Kit

- **Benchmark NetSys-T**

1. Routers Protocol : RIPV2.0, OSPFV4 WAN Ports : NetSys-T RTR-SFE model: Serial ports – 2 (RS232 upto 1Mbps);
2. Fast Ethernet ports – 1 NetSys-T RTR-FE model: Fast Ethernet ports – 2 Management Port
3. One Fast Ethernet port for device management and protocol packets monitoring LAN Ports
4. Fast Ethernet ports – 1 Equipment Management & User Interface :
5. Web browser access for ports configuration, device restart, shutdown, Protocol parameters configuration, Routing Table information - periodic update (every 3 or 1 sec), table saving Benchmark NetSys-T Firewall/Layer 3 switch Ports
6. Firewall Mode : Outside network – 1 Fast Ethernet DMZ – 1 Fast Ethernet
7. Inside network – 1 LAN port L3 Mode : Outside network – 1 Fast Ethernet
8. Inside network – 1 Fast Ethernet and 1 LAN port Management : One Fast Ethernet port for device management VLAN Support
9. Tag based VLAN User Writable Rules : IPTables rules, NAT/PAT Address translation, Packet filtering Equipment Management & User Interface : Web browser access for ports configuration, device restart, shutdown, user written rules update, current active rules information display and saving

- **Benchmark NetSys-T**

Comprising: . NetSys-T RTR-SFE – Router with Serial and ethernet WAN ports – 3 . NetSys-T RTR-FE – Router–with fast ethernet WAN ports – 1 . NetSys-T FWL3 – Firewall / Layer 3 switch – 1 Managed Layer 2 switch – 3 Unmanaged Layer 2 switch – 1 Wireless Access Points – 2 Wireless USB adaptors – 3 AC-DC adaptors for equipment – 1 set Cables – 1 set User Manual – 1

- **BENCHMARK LAN Trainer Kit**

Comprehensive set of experiments to observe and measure the behavior of several LAN protocols: MAC Layer: ALOHA, CSMA, CSMA/CD, CSMA/CA, Token Bus, Token Ring, Star Data Link Layers: Stop-and-Wait, Sliding Window – Go-Back-N and Sliding Window – Selective-Repeat User con¬figurable data rates – 8, 16, 32, 64,128, 256, 512 Kbps, 1Mbps Generation of Bit errors and Frame errors between nodes – up to 10-6 Variable Network size – up to six nodes with each NEU. NEUs can be cascaded to increase the network size Emulation of two nodes by each PC . Halves the number of PCs required User con¬figurable delays between nodes - emulates the propagation delay in real networks Allows experimentation using the software provided; source code included for better understanding

- **IoT Kit**

1. Assistance with the control of temperature and humidity levels.
2. Detection of gas and dust levels.
3. Monitoring of water levels and herd locations for agricultural purposes.

- **Lab and Testing Facility**

S.No	Name of the Laboratory	Name of the Apparatus/Equipment	Name of the testing conducted	Commercial Applications/Compliance
1	IT laboratory	High End Workstation (128 GB RAM, dual core 2.50 Ghz CPU, NVDIA 8GB graphics Card, 2 Terabyte HDD. 500 GB SSD)	NIL	No, It is being used for students lab activity and Research activity.
2	Software Testing	Open source tool like selenium, Agile with jira is used for web application software testing.	Chhattisgarh state environment conservation board, Chhattisgarh stamp and registry department.	Yes
3	Software Development Developed e-marketplace software		Jila Panchayat Raipur	Yes

DEPARTMENT OF PHYSICS

The Department of Physics is dedicated to fostering a collaborative and performance-based learning environment, where the aim is to equip individuals with the tools and skills necessary to contribute to society. This commitment extends to providing high-quality Scientific and Technical education, fostering innovation, and nurturing creativity in both Pure and Applied Physics. Our core mission is to continually push the boundaries of knowledge through cutting-edge research, thereby promoting academic growth and offering state-of-the-art undergraduate and doctoral programs. We are driven by the goal of developing human potential to its fullest extent, nurturing not only intellectually capable individuals but also good human beings, who can make meaningful contributions to a wide range of professions. Our overarching mission is to contribute to our country and society by excelling in Scientific and Technical education and research. As a mainstay in supporting national research projects, we collaborate with other institutions and national laboratories to enhance teaching and research activities, working together towards a brighter future.

Our ultimate goal is to achieve academic excellence and holistic development for our students, aligning them with national standards. We also offer analytical and consultancy services to industries, applying the knowledge of Physics for industrial development. For more details, please visit our website, where you can explore the vast array of services we provide.

- **Area of Expertise:**

Material Science, charge storage & transport in polymer thermoelectrets, Luminiscence, electrical behavior of ceramics, Luminiscence, this film related to luminescence materials, Experimental condensed matter Physics, Optical properties of nanophosphors, II-VI Semiconductor thin films, Inorganic solar cells, Theoretical condensed matter physics and applications. Thermoelectric efficiency of InGaN, Condensed Matter Physics (Theory), Band structure, calculation of materials, optical and thermo-electric properties of rare earth based semi-conductor materials

- **Research Projects**

1. Dr. Sadhana Agrawal, Preparation and Characterization of Microcellular Nanocomposites for packaging and semiconducting application, Funding Agency- CCOST, Raipur, 2011, Funded amount - 2 Lakhs
2. Dr. Ayush Khare, An investigation on the optical and structural characterization of some ferro-electric materials, Funding Agency- CCOST, Raipur, Year-2013, Funded amount - 5 Lakhs
3. Dr. B. K. Sahoo, Role of Spontaneous and Piezoelectric Polarization on Thermal Properties of Wurtzite Nitrides, Funding Agency- CCOST, Raipur, Year- 2013, Funded amount - 5 Lakhs
4. Dr. S. M. Saini, Electronic optical and magneto optical properties of rare earth compounds, Funding Agency- CCOST, Raipur, Year-2013, Funded amount - 5 Lakhs
5. Dr. B. K. Sahoo, Effect of interface, Strain and Phonon Confinement on Thermal Conductivity and Thermoelectric Efficiency of GaN/In GaN /GaN Superlattices, Funding Agency- SERB New Delhi, Year-2017, Funded amount - 17.17 Lakhs
6. Dr. Ayush Khare, Development of Highly Efficient CdTe/CdS Tandem Multijunction Photovoltaic System Through Optimization of Various Components, Funding Agency- SERB New Delhi, Year-2017, Funded amount - 34.9 Lakhs

7. Dr. Piyush Jha,Dr. Ayush Khare (Mentor), Development of Highly Efficient Crack Sensor/indicator using Mechanoluminescent Phosphors, Funding Agency- SERB New Delhi, Year-2019, Funded amount - 19.2 Lakhs

- **Testing Facilities**

S.No.	Name of Testing equipment along with photograph/software/other facility	Description of Testing Task view
1	**TLD Reader**	Measurement of thermoluminescence from a powder sample.
2	**UV-Visible Spectrophotometer**	To measure absorption/transmission spectra in UV and visible range
3	**Spectrofluorophotometer**	To measure photoluminescence spectrum of a powder/film sample
4	**LCR Meter**	It is used to measure the inductance (L), capacitance (C), and resistance (R) of an electronic component.
5	**FT-IR Spectrometer**	It is used to obtain an infrared spectrum of absorption or emission of a solid and liquid.
6	**Raman spectrometer**	It is used to determine vibrational modes of molecules, although rotational and other low-frequency modes of systems may also be observed.
7	**Chromameter**	To measure the amount (in Cd/m^2) of light being emitted by a sample.
8	**AAA Solar Simulation**	For the electrical characterization of a solar cell.

DEPARTMENT OF MATHEMATICS

The Department of Mathematics was started in the year 1956. The department provides an outstanding research environment and offers academic programs leading to the award of Ph.D. degree. Apart from this, department taking care of Mathematical input to all undergraduate and postgraduate courses in Engineering and Computer Science Applications.

- **Area of Expertise**:
  Algebra, Rough and Fuzzy Set Theory, Mathematical Biosciences, Integral Transforms, Linear Algebra, Probability, Statistics and Stochastic Process, Operations Research, Mathematical Ecology, Mathematical and Chaos Modelling, Fluid Dynamics, Micropolar fluids, Flow through porous media, Immiscible fluids, Mathematical Modelling, Mathematical Ecology, Cryptology, Biostatistics, Sampling Theory, Computational Statistics and Data Analysis, Mathematical/Computational Physiology, Computational fluid dynamics, Nanofluid.

- **Research Projects:**
  1. Dr. Arvind Kumar Sinha, A Study of Dual Concepts in Modules in Algebra**,** Funding Agency- CCOST, Chhattisgarh, Funded amount - 5.00 Lac.
  2. Dr. Arvind Kumar Sinha, "Fight against the corona-virus pandemic using mathematical modeling under bioinformatics and surveillance", Funding Agency- CCOST, Chhattisgarh, Funded amount - 1.25 Lac.
  3. Dr. Debasisha Mishra, Matrix Splitting of Rectangular /Singular Matrices and its Application to System of Linear Equations, Funding Agency- CCOST, Chhattisgarh, Funded amount - 1.4 Lac.
  4. Dr. Debasisha Mishra, Analysis of Matrix Splittings and its Application in Context of Alternating Iteration Scheme for Rectangular Liner Systems, Funding Agency- SERB, Govt. of India**,** Funded amount - 14**.**86 Lac.
  5. Dr. Debasisha Mishra, Study of Multisplittings of Rectangular/Singular Matrices and its Application in Parallel Solution of Linear Systems, Funding Agency- CSIR, Govt. of India, Funded amount - 4 Lac.
  6. Dr. Debasisha Mishra, Study of Two-Stage Iterative Methods for Solving Rectangular (Square Singular) Linear Systems, Funding Agency- SERB, Govt. of India, Funded amount - 6.6 Lac.
  7. Dr. Debasisha Mishra, Advanced Studies in Generalized inverses of Tensors, Funding Agency- SERB, Govt. of India, Funded amount - 12.46 Lac.
  8. Dr. Sujit Kumar Samanta, Analytical and Computational Studies of some Queueing Models with Markovian Arrival Process and/or Markovian Service Process, Funding Agency-CSIR, Govt. Of India, 16 Lac.
  9. Dr. Sujit Kumar Samanta, A Study on Inventory Management at Service Facility, Funding Agency-National Board for Higher Mathematics (NBHM), Govt. of India, Funded amount - 13.34 Lac.
  10. Dr. Sharada Nandan Raw, Mathematical Modeling of Ecological System : An Application to the Biological Science , Funding Agency- SERB, Govt. of India, Funded amount - 20.29 Lac.

11. Dr. Madasu Krishna Prasad, Cell models for micropolar fluid past porous particles, Funding Agency- CCOST, Chhattisgarh, Funded amount - 1.4 Lac.
12. Dr. Nilesh Kumar Thakur, Modelling Pattern Formation in Spatial Aquatic Systems: Mathematical Models and Applications, Funding Agency- CCOST, Chhattisgarh, Funded amount - 1.0 Lac.
13. Dr. Nilesh Kumar Thakur, Dynamical Study of Delay- Induced Stability and Chaos in Plankton Population, Funding Agency- SERB, Govt. of India, Funded amount - 15.11 Lac.
14. Dr. Deepmala Sharma, A Randomized Double-Blind, Placebo Controlled Trial with an Open Label Extension to Assess the Immuno-modulatory Eects of Ashwagandha (WithaniaSomnifera) Extract on Healthy participants, Funding Agency- Etica Clinpharm Pvt. Ltd., Raipur, Chhattisgarh, Funded amount - 0.34 Lac.

DEPARTMENT OF MECHANICAL ENGINEERING

Established in the year 1958-59 in the erstwhile Government Engineering College (GEC) Raipur and part of NIT Raipur form 2006, the Mechanical Engineering Department (MED) is one of the largest departments of the institute offering both the Undergraduate (UG) and the Post-graduate (PG) programs. The UG program leads to award of Bachelor of Technology (B. Tech.) in *Mechanical Engineering* while the PG programs leads to award of Master of Technology (M. Tech.) in *Thermal Engineering*, *Machine Design*, and *Industrial Engineering & Management*, respectively. Mechanical Engineering is the only department in the institute to get both the UG and the three PG programs duly accredited by the National Board of Accreditation (NBA). The department also offers Ph. D. program in all the relevant specializations namely Design, Thermal, Industrial Engineering & Industrial Management. The Sanctioned Intake for various programs is as follows:

<table>
<tr><th>Program</th><th>Degree</th><th>Specialization</th><th>Sanctioned Intake</th></tr>
<tr><td>UG</td><td>B. Tech.</td><td>Mechanical Engineering</td><td>115</td></tr>
<tr><td rowspan="3">PG</td><td rowspan="3">M. Tech.</td><td>Thermal Engineering</td><td>17</td></tr>
<tr><td>Machine Design</td><td>13</td></tr>
<tr><td>Industrial Engineering & Management</td><td>13</td></tr>
<tr><td rowspan="4">Ph. D.</td><td colspan="3">All relevant areas of Mechanical Engineering (Design, Thermal, Industrial Engineering & Management)</td></tr>
<tr><td colspan="3">Pursuing</td></tr>
<tr><td colspan="2">Full Time</td><td>Part Time</td></tr>
<tr><td colspan="2">29</td><td>38</td></tr>
</table>

- **AREA OF EXPERTISE:**
  Faculty members with years of experience in their respective domains are able to handle the respective areas for research and consultancy. Based on the faculty expertise, the thrust areas not limiting to are broadly categorised into the following:

  1. **Machine Design**:
  Computational and Solid Mechanics, Mechanisms and Synthesis, Robotics, Tribology, Mechanics of Composite and Advanced Materials, Finite Element Methods (FEM), Vibration Analysis and Control, Fatigue and Fracture Mechanics, Smart Structures, Micromechanical Modeling, X-FEM, and Mechanical Characterization.

  2. **Thermal Engineering:**
  Computational Fluid Dynamics (CFD), Turbulence Modelling, Numerical Heat Transfer, Alternate Fuels, Solar Energy, Refrigeration and Air Conditioning, Rheology of Complex fluids, Renewable Energy, Multiphase flows, Thermal Energy, Turbomachinery, Passive Heating and Cooling, Thermal Comfort and Green Buildings.

  3. **Industrial Engineering & Management:**
  Strategic management, Industrial Engineering, Decision modelling tools, Supply chain management, Optimization Techniques, Production Management, Soft Computing and Automation, and Virtual Instrumentation, Advanced Manufacturing Processes, Rapid Prototyping,

Additive Manufacturing and Defence Applications, Microstructural characterization of metals and alloys, Corrosion, Welding and Joining, Laser beam and electron beam welding, Hot Deformation, and Kinetic Precipitation.

- **RESEARCH PROJECTS (**On going**)**
  1. NITRR/RP/Mech./2016/67: Characterization of Strain Induced Behaviours of Electro- active Polymers (EAP) for Sensor and Actuator Applications (September 2016). Amount: ₹ 31,52,600.00:
     Agency: DST-SERB: Current Status: On Going
     Principal Investigator (PI): Dr. Raj Kumar Sahu
  2. NITRR/RP/Mech./2018/93: Experimental Investigation and Modelling of Ultrasonic Jet Electrodeposition and Machining for micro part Fabrication (2018).
     Amount: ₹ 31,05,093.00:
     Agency: DST-SERB: Current Status: On Going
     Principal Investigator (PI): Dr. Mridul Singh Rajput
     Co-Principal Investigator (Co-PI): Dr. Harendra Kumar Narang
  3. NITRR/RP/Mech./2021/139: Development of Eco- Friendly Bricks/ Particle Boards from Waste natural Resources for Low-Cost Housing Structures: A Green Manufacturing Technology for Rural Industrialization and Entrepreneurship Development in Chhattisgarh Region (2021). Amount: ₹ 100000.00:
     Agency: Unnat Bharat Abhiyan (UBA 2.0): Current Status: On Going
     Principal Investigator (PI): Dr. Dr. Jagadish
     Co-Principal Investigator (Co-PI): Dr. Sudhakar Pandey
  4. NITRR/RP/Mech./2021/140: Skill Development Campaign for Low –Cost Bamboo-Based Skewer Sticks Making Technique in Bendri Village of Chhattisgarh.
     Amount: ₹ 50000.00: Agency: Unnat Bharat Abhiyan (UBA 2.0): Current Status: On Going
     Principal Investigator (PI): Dr. Dr. Jagadish
     Co-Principal Investigator (Co-PI): Dr. Sudhakar Pandey

- **RESEARCH PROJECTS (**Completed**)**
  1. Determination of operating conditions for hydro-transport of mineral slurry based on wall shear stress and head loss measurement for mineral industries of Chhattisgarh State (2016-2018). Amount: ₹ 500000.00:
     Agency: CGCOST: Current Status: Completed.
     Principal Investigator (PI): Dr. S L Sinha.
     Co-Principal Investigator (Co-PI): Dr. S K Dewangan.
  2. Development, characterization of functionally graded material with self-lubrication property for cutting tool applications (2015-2019). Amount: ₹ 350000.00: Agency: CGCOST: Current Status: Completed.
     Principal Investigator (PI): Dr. R K Sahu.
     Co-Principal Investigator (Co-PI): Dr. G Srinivasu.
  3. Design and validation of bike-based patient carrier transport system for remote areas of Chhattisgarh (2017-2019). Amount: ₹ 100000.00:
     Agency: UNICEF: Current Status: Completed.
     Principal Investigator (PI): Dr. S Bhowmick.
     Co-Principal Investigator (Co-PI): Dr. Govardhan Bhatt.

4. Experimental Investigation and modeling of micro milling assisted ultrasonic jet electrodepositing (Mauje)for micro part fabrication (2018-2021).
   Amount: ₹ 447000.00: Agency: NITRR Seed Grant: Current Status: Completed.

   Principal Investigator (PI): Dr. Mridul Singh Rajput.

- **LABORATORY AND TESTING FACILITIES**

The Department of Mechanical Engineering being one of the largest in the institute also houses state of the art laboratory and testing equipment as mentioned below.

- **MACHINE DESIGN:**

1. Universal Testing Machine (UTM) 20 Ton Capacity: Apart from the curriculum, this machine is used for consultancy works related to testing of High yield strength deformed (ribbed bars) used in construction.
2. Automatic Micro Vicker's Hardness Testing Machine: Used to predict the micro hardness of given material (polymer, brass, copper, and Steel)
3. Universal Testing Machine (Load Cell: 10 KN): Used primarily for the testing of polymer composites
4. Inverted Microscope.
5. Impact Testing Machine (Izod and Charpy)
6. Cupping Testing Machine.
7. Four Ball Tester Test rig.
8. Pin on Disc Apparatus.
9. Rolling element Bearing Test Rig.
10. Abrasive Test Rig.
11. Photo-elastic bench.
12. Stress Freezing Oven.

- **Programming Languages**

1. MATLAB,
2. C++,
3. Python**.**

- **Computer Aided Design (CAD),** and **Simulation Softwares:**

1. CATIA.
2. DELMIA.
3. SOLIDWORKS.
4. ANSYS-Fluent.
5. AUTODESK INVENTOR.
6. DEFORM-3D.

- **THERMAL ENGINEERING**

1. Smoke meter for emission level in the exhaust gas
2. KD02-pro Thermal Conductivity Measurement apparatus.
3. Temperature and Humidity Measurement data logger.
4. Smoke level measurement apparatus.

5. Solar Thermal training kit.
6. Solar Thermal Concentrator.
7. Pyranometer for Solar Radiation**.**

- **INDUSTRIAL ENGINEERING & MANAGEMENT**

1. Witness Software
2. SPSS (Central Purchased)
3. Scilab Software

- **WORKSHOP**

1. Tungsten Inert Gas (TIG) Welding Machine.
2. Submerged Arc Welding (SAW) Machine.
3. Latest Computer Numeric Control (CNC) trainer.
4. Production capacity Lathe Machine.
5. Milling machine.
6. Electric Discharge Machine.
7. Hot Air Oven and Hot Air Furnace used for consultancy purposes for the removal of Moisture from different types of composite materials.

In addition to the above, the department also has more than 10 latest workstations and the department is also enhancing its facilities every year with latest state of the art equipment.

The Department with its existing capabilities, knowledgeable faculty members, capable staff members, and a good strength of research scholars is open to interaction with the community, and respective industries for any possible collaboration.

- **List of Lab and Testing Facility**

S.No	**Name of the Laboratory**	**Name of the Apparatus/Equipment**	**Name of the testing conducted**	**Commercial Applications/Compliance**
1	MMM Lab	Universal Testing Machine10 kN	Tensile, Compression, Relaxation and Creep test at room temperature	Academic/Commercial
2	MMM Lab	Optical Microscope	Granular structure calculation, composite composition calculation, surface filler distribution imaging	Academic/Commercial
3	HMT Lab (Rheology Lab)	Modular Compact Rheometer (MCR 102)	Steady state rheology characteristics, Yield stress measurements, Stress relaxation measurement, Shear rate step-change measurement, Hysteresis loop, Thixotropy shear test, Oscillatory shear measurements	Academic/Commercial
4	Workshop (Material Proccesing and	Electric-discharge machine (Die-sinking)	Machining of various conductive materials; Stamping and Tool preparation & cutting	Academic/Commercial

	Advance Manufacturing)		of different conductive materials	
5	Workshop (Material Proccesing and Advance Manufacturing)	Surface Roughness Tester	Measurement of different roughness parameters like Ra,Rz,Rq,RtRp,Rv,R3z etc. for on metal and non- metal workpieces having various surface profiles	Academic/Commercial
6	Workshop (Material Processing and Advance Manufacturing)	Vacuum Oven	Drying & Heating of Different Materials@ 200^0C (Max.)	Academic/Commercial
7	Workshop (Material Processing and Advance Manufacturing)	Hot Air Oven	Drying & Heating of Different Materials @ 2000C (Max.)	Academic/Commercial
8	Workshop (Welding Shop)	MIG, TIG and SAW based welding machine & equipment	All type of joints (butt, V-, double V-, T-, Lap- and multi pass- joints, etc.) is possible by trained staff.	Academic/Commercial
9	HMT Lab	KD2 Pro Thermal Properties Analyzer	Measurement of Thermal Conductivity, resistivity, volumetric specific heat capacity and diffusivity	Academic/Commercial
10	STM Lab	Universal Testing Machine 200 kN	Tensile strength, Compressive Test, Bend Test of different conductive materials.	Academic/Commercial
11	Workshop (Material Processing and Advance Manufacturing)	Micro Milling and Engraving	Micro Milling Machining work	Academic/Commercial
12	Tribology Lab	Roller Bearing Testing Machine	Measurement of Vibration on test bearing for design load and speed	Academic/Commercial
13	Tribology Lab	4 Ball Tester	Wear & Friction Test of Lubricants	Academic/Commercial
14	MMM Lab	Micro Hardness Tester	Hardness Test	Academic/Commercial
15	MMM Lab	Pin on Disc Test rig	Wear test at room and high tempture (400 C) both dry/wet lubrication can also be used	Academic/Commercial

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

The Department of Metallurgical engineering started in 1956. Recently, it is renamed as Department of Metallurgical and Materials Engineering. The Department is running undergraduate and doctoral program. The post graduate program shall be introduced soon.

- **Area of Expertise:**

  XRD and SEM testing and analysis, High Entropy Alloys, Heat Treatment of Alloys, High Strain rate deformation, Synthesis and characterization of Nanomaterial and Nanofluid, Heat Transfers in Nanofluid, Electrochemical Characterization (Tafel and EIS), Alloy design for various applications, Applications of Density Functional Theory for Materials Design for Various applications, Foundry, Solidification, Advanced Metal Casting Technology, Physical Metallurgy, Testing of Materials, Alloy development, Non-ferrous alloys, Business analysis, development of AI based predictive models, data analysis related to Materials and Metallurgical processes, Structure property correlation, Welding, Composite materials, Tribology, Thin Films, wide band gap semiconductors, light metals and alloys, structural and Bio-ceramics, structure-property correlations in advanced engineering materials, Failure Analysis of Products/Parts / Structures (Metals /Ceramics/Composites), Tensile, Compression, Hardness (Micro/Macro) tests, XRD, Microstructural (Optical, SEM), Heat Treatment studies for property enhancement and Analysis, 3D Printing of Polymer Structures and its analysis, Casting of Metal Lattice/Cellular Structure.

- **Research Projects**

  1. Dr. Manoj Chopkar has completed two research projects as Principal Investigator (PI): Study of high rate torsional behavior of Aluminum-Zinc alloy (Al 7075) funded by Science and Engineering Research Board (SERB), India of Rs. 23, 27,000/- and Study of Ageing Behaviour of Copper added Austenitic Grade Stainless Steel and Modelling of Aging Characteristics funded by The Institution of Engineers, India (IEI) Research and Development program of Rs 50,000/-. Dr. Subhas Ganguly was the Co-PI in the second project.
  2. Dr. Sanjeev Das has completed one project as PI on Improving the Strength of Aluminum 6082 (T6) Alloy by suitable Age-hardening Treatmentof Rs. 3,75,000/- funded by Cold Forge Limited. Another two projects (Development of Sustainable Metal Casting Technology for Low Green House Emission of Rs.45,00,000/- funded byRoyal Academy of Engineering in collaboration with Vedanta Limited & University of Warwick and Identifying the basis of Dross Generation in the molten Al-Si Aluminum Alloy of Rs. 5,00,000/-funded by BALCO) are under progress.
  3. Dr. Sudip Kumar Sinha has been awarded the DST-SERB CORE Research grant project (Grant No: CRG/2019/003480) as P.I. on "Development of Low-ppm Ammonia sensors using NiO/CeO2 heterostructured nanofibers" with a fund of Rs. 33 Lakhs /-.

- **Testing Facilities**

  The Department has developed facilities of XRD, SEM, Universal Testing Machine, Vacuum Arc Melting Unit, Wire cut Electro-discharge machine, Friction Stir Welding unit, Ball Mill, Potentiostat, Pin-on-disk wear testing set up, Optical microscopy facility and several workstations for modeling and simulation activities. Several other facilities are under development to facilitate research work of the PhD scholars, testing and consultancy services and laboratory work of undergraduate students.

- **Lab and Testing Facility**

S.No	Name of the Laboratory	Name of the Apparatus/Equipment	Name of the testing conducted	Commercial Applications/Compliance
1	XRD LAB	1. X-Ray Diffraction	To analyze physical properties such as phase composition, crystal structure and orientation of powder sample	yes
		2. Differential Scanning Calorimetry DSC	To analyze thermal property of materials	yes
		3. Semi-Automatic Vickers Hardness Tester	Analysis of material hardness	yes
2	SEM Lab	4. EVO Scanning Electron Microscope	Analysis of microstructure and element analysis	yes
3	Welding & Machining Shop	5. Milling Machine with Accessories for Friction Stir Welding	Metal Welding	yes
		6. Arc Welding Machine	Metal Welding	yes
		7. Compaction Press 50 T	Powder Compaction	yes
		8. TIG & Arc Welding	Metal Welding	yes
4	Metal Casting Lab	9. Muffle Furnace	Material heating	yes
5	Testing Of Materials	10. Universal Testing Machine	Tensile Test	yes
		11. Wear Testing Machine	Wear Test	yes
		12. Planetary Ball Mill	Powder Metallurgy	yes
		13. Spin Coating Unit	Coating	yes
		14. Electric Resistivity Measurement system	Electric resistivity measurement	yes
		15. High Temperature Atmosphere Tubular Sintering Furnace	Material heating	yes

		16. 3 D Printer	Polymer 3D parts preparation	yes
		17. Electro Spinning Unit	Fibre Development	yes
		18. Hot Air Oven	Material heating	yes
6	Physical Metallurgy	19. Inverted Metallurgical Microscope	Sample Micrograph	yes
		20. Upright Metallurgical Microscope	Sample Micrograph	yes
		21. Rockwell Hardness Tester	Hardness Test	yes
		22. Automatic Polishing Machine	Material Polishing for microscopy	yes

DEPARTMENT OF MINING ENGINEERING

The Department of Mining Engineering was established in the Year 1956 with intake capacity of only 15 students. Due to increasing demand of mining engineers from coal and mineral industry, the intake capacity has now been increased to 77. At present, there are 291 undergraduate students in various semesters and 13 PhD scholars registered in the Department. The Department is equipped with state of the art modern instruments and equipment for conducting various laboratory and research work. The Department has undertaken and successfully completed number of testing and consultancy projects.

- **Area of Expertise**:

  Blasting Engineering, U/G Coal Mining, Mine Surveying, Mineral Engineering, Mine Environment, Rock Mechanics, Strata Control, Blasting Engineering, Mine Environment, U/g Metal Mining, Rock Mechanics, Surface Mining, Ground Vibration study, Slope Stability, Ventilation, Environment, CFD, Geo-statistics, Computer Applications, Geomatics, Economic Analysis, Slope Stability, Mine Safety Engineering, Occupational Health and Safety, Accident Investigation System, Risk Based Accident/Incident Management System, Disaster Management, Mine Legislation and General Safety, Rock blasting, Rock mechanics, Mine Legislation.

- **Testing Facilities:**

  Laboratory testing equipment for measurement of various physic-mechanical properties of rocks & soils; Equipment for measurement of whole body vibration; Equipment for measurement of chemical composition of water samples; Equipment for measurement of personal dust exposure; Equipment for conduction of mine ventilation survey; equipment for mine surveying; Software for slope design and stability analysis; Software for design of structures; Software for mine planning; equipment and Software for measurement and analysis of blast induced ground vibrations and inhole VOD of explosive.

- **Details of Lab and Testing facility**

S.No	Name of the Laboratory	Name of the Apparatus/Equipment	Name of the testing conducted	Commercial Applications/Compliance
1	Rock Mechanics	Universal Testing Machine	Uniaxial compressive / Confined strength	Determination of physico-mechanical properties of rock sample, which is widely used in mining and civil industry for construction, establishment of new projects. Mining plan, strata control and monitoring plan,
2	Rock Mechanics	Universal Testing Machine	Youngs modulus of elasticity	
3	Rock Mechanics	Universal Testing Machine	Possions ratio	
4	Rock Mechanics	Universal Testing Machine	Scant modulus	

5	Rock Mechanics	Universal Testing Machine	Single shear strength	slope stablity plan of benches in opencast mines can be prepared
6	Rock Mechanics	Universal Testing Machine	Double shear strength	
7	Rock Mechanics	Universal Testing Machine with Triaxial Cell	Measurement of cohesion and angle of internal friction of rock core sample	
8	Rock Mechanics	Point load test machine	Calculate Uniaxial compressive / Confined strength of irregular shape sample	
9	Rock Mechanics	Brazilian test machine	Calculate tensile strength of core sample	
10	Rock Mechanics	Protodyknov strength apparatus	Uniaxial compressive / Confined strength of crushed / powder sample	
11	Rock Mechanics	Slake durability apparatus	To check weatherability	Calculation of RQD, RMR (Rock Mass Rating), support design, strata control and monitoring plan
12	Rock Mechanics	Volumetric density test apparatus	Density of irregular shape sample	
13	Rock Mechanics	Large Direct Shear Test Machine	Measurement of cohesion and angle of internal friction of aggregate sample	Determination of physico-mechanical properties of soil or powder sample, which is widely used in mining and civil industry for construction, establishment of new projects. Slope stability analysis, dump stability analysis, method of working etc. can be done.
14	Rock Mechanics	Small Direct Shear Test Machine	Measurement of cohesion and angle of internal friction of aggregate sample	
15	Rock Mechanics	Pycnometer	Specific gravity of soil or powder sample	
16	Rock Mechanics	Cone penetrometer	To calculate the liquid limit of soil /powder sample	
17	Rock Mechanics	Casagrande apparatus	To calculate the liquid limit of soil /powder sample	
18	Rock Mechanics	Plastic limit apparatus	To calculate the plastic limit of soil /powder sample	
19	Rock Mechanics	Ultrasonic pulse velocity machine	calculation of dynamic modulus of elasticity, Poisson’s ratio	determination of velocity of primary and secondary waves in rock mechanics and rock blasting field

20	Rock Mechanics	Permeability test apparatus	To calculate percentage of permeability of rock sample	In geo-technical and geological, mining, civil testing fields
21	Rock Mechanics	Cutter-Core Cutting Machine -Grinder-Polishing-Oven Machine	To prepare required sample	To prepare sample for above tests
22	Blasting	Seismograph	Establishment of predictor equation for blast induced ground vibration and air over pressure	Scientific Study for designing a suitable blast design parameters for control blasting under regulation 106 amd 196 (3) of CMR, 2017 and regulation 106 (2) (b) and 164 (1-B) (a) of MMR for calculation of maximum safe charge per delay using deep hole drilling and blasting
				Scientific study to assess the suitability of bulk explosive system in any mine
			Monitoring purpose	Monitoring of ground vibration as per DGMS
				Monitoring of air-over pressure and noise during blasting activity as per DGMS
23	Blasting	Wipfrag	Fragmentation study of blasting	Boulder count, Determination of size distribution, productivity of explosive used and blasting performance enhancement
24	Blasting	Inhole VOD Mate	Measurement of inhole VOD of explosive	Productivity and check of explosive performance, calculation of velocity of detonation of explosives

CAREER DEVELOPMENT CENTER

As per the vision of the institute and under the advice and guidance of the Director, the erstwhile Training and Placement Department was restructured and realigned to focus on developing innovation and entrepreneurial skills in students, while also continuing with endeavors to provide the relevant career opportunities to them. To take care of students' career and also to motivate them towards path of innovation and entrepreneurship, four cells to specifically focus on these activities were constitute under the career development center – the placement cell, the training and internship cell, the innovation cell, and the entrepreneurship cell.

- **Placement Cell**

  The placement cell continues to make efforts for ensuring campus placement opportunities for students under the leadership of Dr Manoj Chopkar as the faculty in charge. We are happy to share that due to your support NIT Raipur has been making continues improvement in types of career opportunities and the offers the students are getting every year. We request your continued support by giving us the opportunities to meet your requirements of qualified and skilled professionals for your professional team.

- **Training and internship Cell**

  The training and internship cell endeavors to impart students with the various skill sets required to meet the industry expectations and also to ensure professional and personal success in their career and life. The skilling of students is looked after Dr Suraj Kumar Mukti as the faculty in charge. Dr Alok Naugarhia looks after the internship of the students. Your continued help in this area has made our students readily acceptable by various employers. We look forward to your continued support to expose our students to the best practices in industries, by providing them opportunities to train with your team, to guide them with seminars and interactive sessions by your leaders. Accepting the longstanding industry demand, we have also modified our academic schemes for M Tech programs and B Tech programs to accommodate, respectively, one year internship for M Tech program and six month internship for B Tech programs (from 2022 batch). We request you to take advantage of this and select students as interns for your organization.

- **Innovation Cell**

  Both the innovation cell and the entrepreneurship cells are keenly driven to create environment and support system to motivate and nurture the innovation and entrepreneurial skills of the students through orientation programs, exposure sessions by experts, workshops, and various events to test and hone the skills of students.

  Innovation Cell, since its creation in May 2018 under the supervision of Dr Saurabh Gupta as the faculty in charge, aims to inculcate the spirit of innovation and entrepreneurship amongst the students, encourage and support innovations through guidance, mentorship and support. Students are encouraged to take up innovative projects with possibility of commercialization.

  - **Objectives**

    The objectives of Innovation Cell are:

    - To channelize the knowledge and the energy of youth towards becoming active partners in the economic development process

- To motivate, support and mentor students for identification and development of their innovative ideas
- To catalyse and promote development of knowledge-based and innovation- driven enterprises and promote employment opportunities amongst youth specially students
- To inculcate a culture of innovation driven entrepreneurship
- To act as an institutional mechanism for providing various services including information on all aspects of enterprise building to budding S&T innovators
- To make students understand challenges of an entrepreneur and its solutions in frugal conditions
- To make cost efficient lab equipments like 3d printers, drones and other DIY projects
- To encourage students for interdisciplinary representation and forming teams and bringing the expertise on one platform

v Infrastructure - Makerspace

Makerspace at NIT Raipur is set up on the theme of Open Community Technology Development Culture to promote mainly frugal innovations. It is set up to provide 24x7 working ecosystem to prospective entrepreneurs of NIT Raipur. Once the raw and innovative ideas start taking shapes, they are incubated in a proper system of Technology Business Incubator (TBI). **Main Objective of the Makerspace is t**o provide a collaborative workspace for tinkering, making, learning, exploring and sharing ideas.

v Entrepreneurship Cell

The Entrepreneurship cell, NIT Raipur, under the guidance of Dr R. N. Patel as faculty in charge, manifests the essence of entrepreneurship in the passionate youngsters who have the zeal to pursue entrepreneurship and advocate this enthusiasm to the youth. Keeping this ideology in mind we not only provide the foundation to the entrepreneurial capabilities of the promising young minds but also help in nurturing their skills by providing resources to develop new ideas, mentorship programs, workshops to help them organize their strategy and frequent, highly interactive speaker sessions and lecture series.

At our flagship program, E-Summit, we aspire to create a mélange of eminent speakers who have proved themselves in diverse fields and are at the zenith of glory. Every year E-Summit is not just a conclave of innovative minds and epistemic elocutionists, but it is the place where ideas not only thrive but become the prototype and businesses. Some specific events organized every year by us are ‘INNOVATION YATRA’, Cluedo, Ad-o-holic, the B-Plan competition, Wallstreet, HR Sutra, The Case-D-Studio, Cricnometrica, Entrepreneurship Development Programs, the “Counselling Quiz”, E-Quiz, E-talks.

v Some major activities under Innovation and Entrepreneurship Cell

1. The Institute has developed 24X7 facility accessible to students- Makerspace to promote Innovation culture at NIT Raipur
2. Two open elective courses – Basic Course in Entrepreneurship and Advanced Course in Entrepreneurship were started in 2019 with Wadhwani Foundation for 3rd and 4th year students. These courses are being delivered by Dr Subhas Ganguly and Dr Saurabh Gupta of the institute.
3. Students have been provided number of Seed grants and Acceleration grants by the institute for Innovation and Entrepreneurship
4. Active participation of students and faculty members in MHRD Innovation Council activities, Hackathons, Entrepreneurship Summit, Webinars, Workshops, Exhibition and Competition for Innovations, Faculty Development Program
5. Implementation of National Innovation and Startup Policy in the Institute is in the process
6. The Application for Technology Incubation Centre from DST NSTEDB at the Institute is in process.
7. The Cell works with IP Cell of the Institute to provide the support to students for patents. Few students have been granted patents.

v Achievements

We have some achievements to boost our morale in this journey of two years:

1. The Institute has been ranked in Band 'A' (Ranks between 11- 25) in Atal Ranking of Institutions on Innovation Achievements (ARIIA), 2020 by the Innovation Cell, Ministry of Education, Govt. of India among Institutes of National Importance, Central Universities and Centrally Funded Institutes on 18th Aug., 2020.
2. NIT Raipur is also amongst top 5 Institutions in the East Zone and secured the top rank among centrally funded Institutes in Chhattisgarh.
3. The Institute has been recognized as Host Institute (Business Incubator) by Ministry of MSME - GoI for implementation of the scheme "Support for Entrepreneurial and Managerial Development of MSMEs through Incubator".
4. The Institute Innovation Council (IIC) of the Institute was ranked among top 25 best IICs out of 950 in India for Innovation by MHRD Innovation Council in 2019
5. 3 Students Startups are registered and have been provided all possible mentorshin all ip the related areas i.e. technical, financial, managerial

6. Students teams are consistently winning Smart India Hackathon and other National and International events every year

Innovation and entrepreneurial activities require a lot of hand holding and active support from industries. We request your wholehearted support in this entrepreneurial transformation of students. You can support us by sharing your technical and managerial problems that require innovative solutions, you can provide mentorship to our students, you are always welcome to share your experience and wisdom to our budding entrepreneurs, you can also fund their ideas by becoming a partner in their journey.

CDC endeavours to equip the students with skill sets that are both essential and coveted, in the continuously evolving areas of engineering and technology. We strive for symbiotic industry-institute partnership by involving institute with industry in several activities such as campus placements, internships, industrial visits, expert lectures and seminars from industry heads and prominent professionals. We also welcome your support to our students in their innovation and entrepreneurial journey.

For further details you may also like to visit the following links:

- http://cdc.nitrr.ac.in/
- http://cdc.nitrr.ac.in/innovationcell.html
- https://ecell.nitrr.ac.in/
- http://cdc.nitrr.ac.in/trainingcell.html
- http://tpo.nitrr.ac.in/

MEMORANDUM OF UNDERSTANDING (MOU)

MoUs Signed by the Institute.

S. No.	Name of the Organization	Date of MoU	Purpose of MoU
1	Cold Forge, Faridabad	16-Sep-16	For promoting an integrated and collaborative strategic approach to product research, design, development, technology transfer and innovation.
2	Jayaswal Neco Industries Limited, Raipur	16-Sep-16	For promoting an integrated and collaborative strategic approach to product research, design, development, technology transfer and innovation.
3	Vedanta Limited	25-Jan-18	For mutual exchange of knowledge and capabilities through visits & activities, and for carrying out testing and consultancy projects.
4	University of Warwick, UK	05-Feb-18	For solving various challenges of science, engineering and technology by carrying out mutually beneficial collaborative research projects.
5	National Mineral Development Corporation Limited (NMDC)	24-Apr-18	To carry out Feasibility studies on removal of contaminants from surface and ground water of Bailadila iron ore mine project and peripherals.
6	Department of Commerce and Industry Chhattisgarh	25-Apr-18	To provide boost to entrepreneurial talent and develop a startup eco-system through events, workshops and activities.
7	AIC@36INC	27-Apr-18	For promoting entrepreneurship through incubation to selected promising start-ups, and training & development programs and events.
8	Innovatio Curis Private Limited, Delhi	05-May-18	For promoting an integrated and collaborative strategic approach to product research, design, development, technology transfer and innovation.
9	Vali-E-Asr University Iran	10-Jan-19	For exchange of students, faculty members and research materials, and coordination in collaborative research projects.
10	National Ilan University Taiwan	22-Jan-19	For exchange of students, faculty members and research materials, and coordination in collaborative research projects.

11	National Institute of Industrial Engineering (NITIE) Mumbai	05-Feb-19	To promote interaction and collaboration between faculty, staff and students through visits and exchange programs, and to carry out joint academic and research programmes.
12	University of Calabria, Italy	27-Jun-19	For exchange of students, faculty members and research materials, and coordination in collaborative research projects.
13	Universidad Autónoma de Ciudad Juárez Mexico	17-Jan-20	To explore educational and scientific exchange programs, and mutually beneficial collaborative research projects.
14	Damghan University, Iran	17-Feb-20	For academic exchange and cooperation in conducting mutually beneficial collaborative research projects.
15	Chhattisgarh Council of Science & Technology (CGCOST)	04-Sep-20	For addressal of Intellectual Property Rights to foster innovative research collaboration and consultancy.
16	National Highway Authority of India (NHAI)	01-Nov-20	To enable the institute to voluntarily adopt nearby stretches of National Highways for using them as fields of study through paid internships for betterment of the highway infrastructure.
17	Taylormade Renewable Limited, Gujarat	01-Nov-20	To facilitate and promote research of waste water treatment technologies for effective wastewater treatment of domestic, groundwater and industrial effluents.
18	Centre for Ganga River Basin Management and Studies, IIT Kanpur	04-Dec-20	For development and execution of project proposals and activities to support implementation of Ganga River Basin Management Plan.
19	3D Srishti Private Limited, Hyderabad	29-Dec-20	For developing edible polymers, biodegradable materials, smart composite materials and exploring the usage of materials developed by 3D printing technologies.
20	Ministry of Micro, Small and Medium Enterprises (MSME)	06-Jan-21	To jointly implement the programme 'Design Expertise for Manufacturing MSME sector' by providing expert advice and cost-effective solutions on real-time design problems.
21	MSME Technology Centre Durg	05-Feb-21	To develop skilled manpower in the specialized domain of Engineering and Emerging Technologies by conduction of joint certification courses and short/long term training programmes for students, faculty and industry professionals.

22	IIT (BHU) Varanasi Regional Academic Centre for Space (RAC-S) set up by ISRO	28-Jun-21	For academic and research exchange in the areas of relevance to the future technological and programmatic needs of the Indian Space Programme and to act as a facilitator for the promotion of space technology activities in the state of Chhattisgarh.
23	Construction Industry Development Council	24-Jul-21	To collaborate for initiating, developing and implementing programmes of Internship, Faculty Development, Capacity Building and other short-term and long-term training programmes for the students and faculties.
24	Telecom Sector Skill Council	28-Jul-21	For setting up a Centre of Excellence for imparting practical training in the domain of Information & Communications Technology, Cyber Security, Electronics & Communication including technical services and allied fields to enhance the employability of aspiring students.
25	Changzhou Institute of Technology, China	20-Oct-21	For exchange of students, faculty members and research materials, and coordination in collaborative research projects.
26	National Technical Research Organisation (NTRO)	17-Nov-21	For joint R&D projects in relevant domains & technologies, availing opportunities of higher education and for participation of students in internship programs.
27	National Institute of Hydrology Roorkee	06-May-22	To promote academic and research cooperation through collaborative research activities, joint events, training of students and exchange of faculty, scientific & technical information.
28	All India Institute of Medical Sciences (AIIMS) Raipur	09-Sep-22	For the advancement of healthcare science & engineering through collaborative research activities, educational programmes, joint events and exchange of faculty, scientific & technical information.
29	Central Power Research Institute, Bangalore And National Institute of Technology, Raipur	13th January 2023	For research purpose to execute the CPRI Sponsored Research Scheme on Power (RSOP) project for R and D in the Indian Power sector titled "Design and Development of Artificial Intelligence Based Short Term Load Forecasting Model".

QUICK GLIMPSES






CONVOCATION DAY







ENVIRONMENT DAY









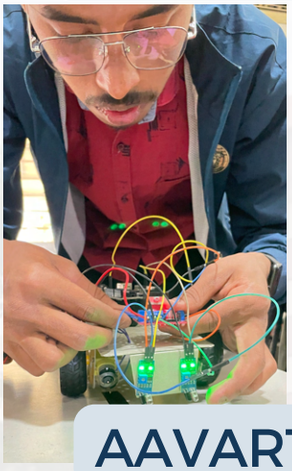




YUVA SANGAM

QUICK GLIMPSES


CODEUTSAVA 6.0



AAVARTAN 23







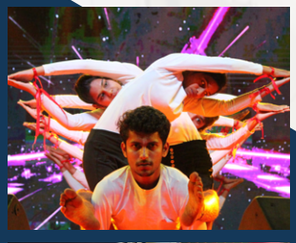
SAMAR 23

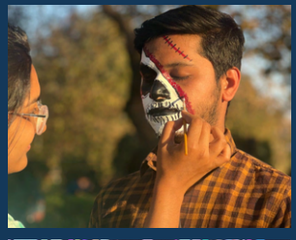



TEDx Talks



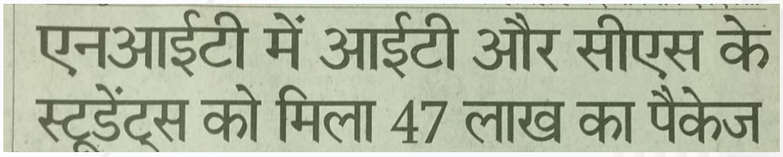
ARCHIFEST 23

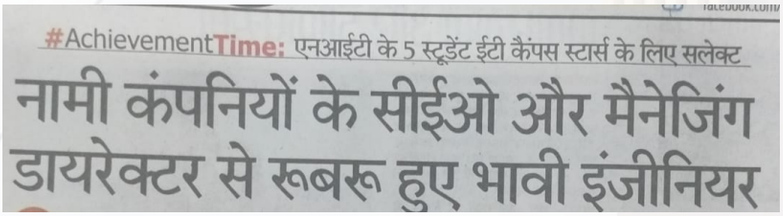






ECLECTIKA 23

NIT RAIPUR IN MEDIA


एनआईटी में आईटी और सीएस के स्टूडेंट्स को मिला 47 लाख का पैकेज


#AchievementTime: एनआईटी के 5 स्टूडेंट ईटी कैंपस स्टार्स के लिए सलेक्ट

नामी कंपनियों के सीईओ और मैनेजिंग डायरेक्टर से रूबरू हुए भावी इंजीनियर


नई तकनीक : कम कीमत में सेल्फ ड्राइविंग कार

विजन कैमरे से खुद चल सकेगी कार, एनआईटी के टीचर-छात्र का कमाल

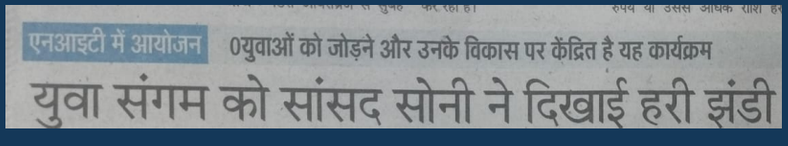

ब्लड डोनेट कैंप में एनआईटी के छात्रों ने किया रक्तदान


एनआइटी में सर्टिफिकेट पाठ्यक्रम शुरू, 172 प्रतिभागी ले रहे हिस्सा


नाट्य के माध्यम से बताए तनाव-मुक्त रहने के तरीके

राष्ट्रीय प्रौद्योगिकी संस्थान में मानसिक समस्याओं पर आयोजन


सिपेट-एनआइटी मिलकर करेंगे शोध

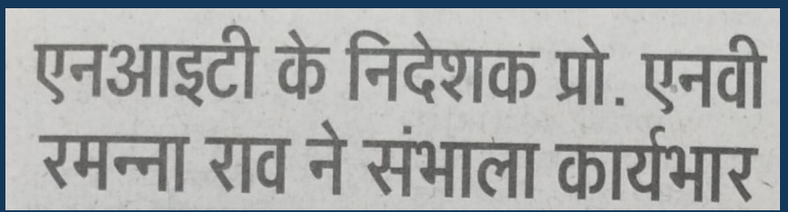

एनआइटी में आयोजन

0युवाओं को जोड़ने और उनके विकास पर केंद्रित है यह कार्यक्रम

युवा संगम को सांसद सोनी ने दिखाई हरी झंडी


Students visit Sirpur under 'Yuva Sangam'

Raipur, Jun 17: Students


एनआइटी के निदेशक प्रो. एनवी रमन्ना राव ने संभाला कार्यभार


एनआइटी के पूर्व तीन छात्रों ने यूपीएससी में लहराया परचम


NIT Raipur observes National Technology day


NIT organises day-long Research Facility Training Programme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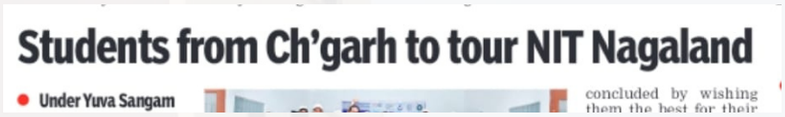
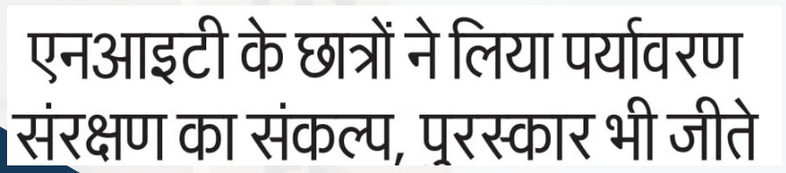
NIT Raipur holds speech competition on Ambedkar Jayanti


Students from Ch'garh to tour NIT Nagaland

Under Yuva Sangam


एनआइटी के छात्रों ने लिया पर्यावरण संरक्षण का संकल्प, पुरस्कार भी जीते


NIT students get placements in Arcesium, NatWest, DBOI


NIT's Motorsports Club holds Induction Programme


NIT organises day-long Research Facility Training Programme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NIT Raipur organises students' visit under Scientific Social Responsibility


नवभारत छत्तीसगढ़ • ओडिशा

Rajdhani - 14 May 2023 - 14raj2

epaper.navabharat.news

24 विद्यार्थियों को गोल्ड और 23 को मिले सिल्वर मेडल

एनआईटी रायपुर में तेरहवें दीक्षांत समारोह का किया गया शानदार आयोजन

NIT RAIPUR IN MEDIA

NIT Raipur first at All India Sports Meet

श्रीलंकाई गायिका योहानी के गानों की धूम

महोत्सव ● एनआइटी के सांस्कृतिक कार्यक्रम इक्लेक्टिका-23 में प्रतिभाओं का हुआ सम्मान

एनआईटी में दो दिनी टेक्निकल फेस्ट आवर्तन

रोबोट रेसिंग और ट्रेजर हंट का महा रोमांच आज से

पत्रिका Plus रिपोर्टर

NIT Raipur commences its Annual Cultural Fest Eclectika'23

सभी महिलाओं की शिक्षा बहुत जरूरी : प्रो. सोनी

एनआईटी की निदेशक डॉ. श्रीमती अनुपम बाला सोनी से चर्चा

गेट: 60 से ज्यादा स्टूडेंट्स सफल

एनआईटी के प्रियांशु को 6वीं व योगेश को मिली 9वीं रैंक

एनआईटी के छात्रों का कमाल : अब आंखों के इशारों से चलेगा कंप्यूटर

अब माउस की जरूरत नहीं, आंख के पलक झपकाने से होता है क्लिक, विजनरी एप लकवा ग्रसित लोगों के लिए वरदान साबित होगा

एनआइटी के विजेता छात्रों का सम्मान

इवेंट : एनआईटी में वार्षिक सांस्कृतिक उत्सव इक्लेक्टिका शुरू

डांस में किया योगा का फ्यूजन, फेस पेंटिंग से ग्रीनरी का मैसेज

NIT Raipur organised Codeutsava 6.0

तकनीकी उत्सव पेड़ों की गिनती करने जैसे आकर्षक माडलों का किया गया प्रदर्शन

एनआइटी के छात्रों ने किया रोबोट हेल्पर का प्रदर्शन

NIT Raipur bags various accolades in All India Inter-NIT Faculty & Staff Sport Meet

ATAL FDP on 'Agri-food supply chain management' organised at NIT

NIT organises 'Annual Alumni Day 2022' meeting session

राष्ट्रीय प्रौद्योगिकी संस्थान रायपुर में टेड टॉक 6.0 का आयोजन

NIT Raipur organises annual fest 'Archifest '23'

NIT hosts guidance session on Civil Services Exam

NIT Raipur celebrates Republic Day and inaugurated SAMAR'22

फाउंडेशन डे एनआईटी में मनाया स्थापना दिवस, विभिन्न क्षेत्रों में बेहतर काम करने वालों को मिला अवॉर्ड

सालभर में एआई और मशीन लर्निंग के 17 पेपर पब्लिश, मिला बेस्ट रिसर्चर अवॉर्ड

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NIT Raipur students grab handsome Rs 22.65 LPA pre-placement offers

■ Staff Reporter

RAIPUR, Mar 12

FINAL year students of National Institute of Technology (NIT), Raipur grabbed outstanding offers of

Arnav Tripathi Vishnu Verma

pre-placement offer of Rs 22.65 LPA CTC. Born and brought up in Raipur, Arnav decided to study at NIT Raipur with his vision already inclined towards analytics. He also secured this placement offer through the National Level Competition

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■ Friday ■ March 24 ■ 2023 TheHitavada

NIT students bag offer from Amazon, Samsung

National Institute of Technology, Raipur
G.E. Road, Raipur, Chhattisgarh
India.