

## **Brochure:**

**Institute Details:** Anugrah Narayan College (A N College), A constituent Unit of Patliputra University, Patna 800013, Bihar

A.N. College, Patna was founded in 1956 in the name of a sagacious and visionary leader, a freedom fighter, a statesman and an able administrator “Bihar Vibhuti” Dr. Anugrah Narayan Sinha. This college imparts holistic education to our students and believes that “Education is not only the learning of facts but the training of mind to think”. This college, since 2005 has been accorded “College with Potential for Excellence (CPE) status by UGC thrice. It was accredited with Grade ‘A’ by NAAC in 2005 and in 2011 re-accredited with Grade – ‘A’ and in 2017 again with Grade “A” (CGPA-3.27/4). The college is fully attuned to face challenges posed by growing demands in the field of higher education. Since its inception in 1956, year by year, this college has scaled new heights and has also grown into a prestigious institution of the state and has also earned accolades at national and international levels. It is a co-educational and multi-disciplinary college. The college has 27 departments including Science, Arts, Humanity, Vocational, Professional, Education and Language courses. Most of these departments run U.G., P.G. and Ph.D. Courses.

The college is conducting pioneering research works with funds provided by agencies like UGC, DST, DBT, DAE, NEERI, UNICEF and various distinguished agencies from U.K. and Europe. Researches in Arsenic, Fluoride, Materials Science, Physical, Chemical, Biological Sciences and Electronics, Social Science and humanities have been internationally acclaimed. The college is a distinguished partner of different “Erasmus Mundas Academic Exchange Programme, EUR India, India 4 EU, NAMASTE, SVAGATA and HERITAGE and Experts Asia Programme sponsored by European Economic Commission and U.K.-India Education

Research Initiatives (UKIERI). The college has numerous collaborations with universities of Europe, U.S.A. and South Korea.

The college is also conscious of its social responsibility. Our endeavor is to preserve heritage and environment. The college has many gardens, green parks, rain-water harvesting unit to conserve water and recharge ground-water, vermi-composting units to minimize solid waste hazards. NSS and NCC units of the college are intensively engaged in extension activities. The college is striving hard to prepare itself to face new challenges of the inexorable march of technology solving growing demands and aspiration of the students and society in unlocking and harnessing new knowledge and innovative ideas building cultural understanding and modelling environment that promote dialogue and debate, paving ways to generate and disseminate knowledge.

### **Vision**

(Absolute Enlightenment through Knowledge)

This is embedded in our logo which forms the core-value of the institution. This institution is committed to provide high quality, affordable education to all sections of society. Being the critical component of human development, the college aims to equip our students with knowledge and skill that allow them to make greater contribution to society. This institution draws inspiration from a famous quote of Bihar Vibhuti Dr. Anugrah Narayan Sinha “Stand by Merit”. Our motto is to reprepare our students to face new challenges of the inexorable march of technology, solving growing demands and aspiration of the society in unlocking and harnessing new knowledge and innovative ideas, building cultural understanding and modelling environment that promote dialogue and debate. We believe that “We cannot always build future for youth but we can build youth for future.”

### **Mission**

- To promote scientific temper among the students to adapt to technological advancement and innovative ideas.
- To inculcate ethical, human and cultural values imbued with sense of participation facilitating holistic growth.
- To provide education accessible to all sections of the society.
- To prepare future generation of skilled professional with essential scruples to compete in diverse global environment.
- To lay emphasis on “ICT Oriented Teaching and Learning” along with “Chalk and Talk” method.
- To encourage critical thinking and analytical skills among the students to instill sense of responsibility actuated by indomitable courage to scale new heights of excellence.
- To inculcate “Gender Equality” and “Respect for Individual’s Right” in a multicultural society as sacrosanct principle.

### **Department Details:**

#### **Department of Masters in Computer Applications (MCA)**

Department of MCA (approved by AICTE) since its inception in 2004 has made steady progress towards betterment and refinement. Our unflinching resolve to stay ahead of time has resulted into introduction of large number of vocational and professional courses. Among these courses, computer science holds the pivotal position. Avidity in computer science besides making you more valuable to potential employer and an enabler for employment also makes you more valuable to potential employer and enabler for employment also makes you more adept in defining problems, unprecedented advancement in technology landscape in the last decade have permeated through every fabric of society moving towards digitally empowered society and knowledge economy. Digital India initiative is also a giant in

technological innovations in form of D waves system and quantum computing, cybernetics, artificial and synthetic intelligence, Internet of Things (IOT), molecular engineering etc are going to be precursor to fourth industrial revolution (4IR).

**Materials Research Laboratory (MRL), Department of Physics** by the virtue of their R & D activities, have been nationally and globally acknowledged. Researchers are involved in national and international projects and exchange programs. International and National Research projects sponsored by DST, UGC, DST Royal Society, UGC-DAE, DRDO and Student-Faculty exchange program under UKIERI, Erasmus and Commonwealth programs have been completed and under-going in Dept. of Physics and Electronics. The various themes of research include Nanotechnology in materials, Electro-ceramics and its applications, Materials for sensors and actuators and Regenerative medicines-Tissue Eng. which have been undertaken by faculty and students of Physics and Electronics.

### **Contents of Faculty Development Program (FDP) to be covered:**

#### **Title: Emerging Trends in Novel Materials (NMs)**

##### **Introduction:**

Materials have central roles in all fields of science and engineering; they define, through structures and devices, our interfaces to the physical and the virtual world. The emergence of novel materials catalyzes transformative advances in civilizations, to an extent that eras of human development are often defined by the prevailing materials used in engineered systems, from the Stone, Bronze, and Iron Ages to the present times, aptly referred to as the Silicon or the Polymer Age. From an academic standpoint, the fundamental phenomena that define complex relationships between chemical compositions, structures, and properties in new/novel materials

serve as the basis for some of the most intellectually stimulating and dynamic areas of research in physical sciences.

The field of novel materials has advanced rapidly in the last 15 years, due to an increasing awareness of materials capabilities, the development of new materials, and increasingly stringent design and control specifications in aerospace, aeronautics, industrial, automotive, bio-medical and nano-systems. Equally important for the advancement of the field is the development of models, numerical approximation techniques, and control design which accommodate the hysteresis and constitutive nonlinearities, inherent to the material. In the industries, there has been a progressive shift from companies that supplied primarily distinct materials classes such as metals, polymers or ceramics, composites etc., to enterprises that supply finished components and systems into medical, energy, aerospace and many other sectors that rely on novel integration of the latest materials developments. In this Faculty Development Program (FDP), the future trends of new and novel materials in terms of three broad industrial and societal needs: (1) sustainability and materials security, (2) materials for energy, and (3) high value markets will be elaborated. These broad areas correspond to the current technology strategy, and provide a broad and convenient structure in which to consider future materials innovation. Candidates of this FDP program will be exposed to the understanding of the basic and advanced science underlying the novel materials to be utilized in various industrial devices. Useful experimental techniques will be described, and a strong emphasis placed on experimental results from the literature to reflect the rapidly evolving nature of this field will be presented.

**Course Contents:**

- a. General background on present and future Novel Materials (NMs)
- b. Introduction to Novel Smart Materials Based Systems (NSMBS)
- c. Recent advances in the applications of NMs

- d. Basic and advanced science in novel materials
- e. Classification and description of NMs based on their physical and chemical properties
- f. Materials processing for NMs
- g. Characterization techniques (Basic and Advanced)
- h. Summary and Future outlook

**Course Coordinator:**

Dr Seema Sharma, Associate Professor, A N College, Patna 800013

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**Date:** August 23<sup>rd</sup> -27<sup>th</sup> , 2021

**Venue:** Online Mode

**Targeted Participants:** Faculty of Colleges and Universities/Research Scholars/  
PG Scholars/Staff of host institution

**Time Schedule of Sessions:**

<b>Time Table</b>	<b>10.00-11.30</b>	<b>11.45-1.15</b>	<b>2.00-3.30</b>
<b>23/08/2021</b>	<i>Lect-1</i> RJC	<i>Lect-2</i> SNJ	<i>Lect-3</i> MK
<b>24/08/2021</b>	<i>Lect-4</i> SNJ	<i>Lect-5</i> RJC	xxxx

<b>25/08/2021</b>	Lect-6 MK	<i>Lect-7</i> KLY	<i>Lect-8</i> GK
<b>26/08/2021</b>	<i>Lect-9</i> KLY	<i>Lect-10</i> NKN	<i>Lect-11</i> PK
<b>27/08/2021</b>	<i>Lect-12</i> YOGA	<i>Lect-13</i> NS	<i>Lect-14</i> Test, Feedback & Valedictory

- RJC- Dr. Ram Janay Choudhary, Scientist-F, UGC-DAE Consortium for Scientific Research Indore Center, (M.P); Email: [ram@csr.res.in](mailto:ram@csr.res.in)
- SNJ- Dr. Sambhu Nath Jha, Scientific officer/H, Raja Ramanna Center for Advanced Technology, Indore; Email: [snjha@rrcat.gov.in](mailto:snjha@rrcat.gov.in)
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- NS: Dr Namita Singh, Neuropsychologist, Apollo Hospitals, Hyderabad, Telangana; Email: [namsingh31@yahoo.com](mailto:namsingh31@yahoo.com)
- YOGA

#### **List of Talks/Lectures in the Workshop:**

1. **Microwave assisted and High Energy Ball Milling assisted Solid State Reaction Synthesis of Functional Materials**, Dr. Pawan Kumar, Professor, Department of Physics & Astronomy, NIT Rourkela
2. **Thin film growth of novel oxides materials for spintronic applications**, Dr. Ram Janay Choudhary, Scientist-F, UGC-DAE Consortium for Scientific Research Indore Center
3. **Indus Synchrotron radiation sources for electronic and magnetic properties studies**, Dr. Ram Janay Choudhary, Scientist-F, UGC-DAE Consortium for Scientific Research Indore Center
4. **Synchrotron source and various techniques in general with a reference to Indus facility**, Dr. Sambhu Nath Jha, Scientific officer/H, Raja Ramanna Center for Advanced Technology, Indore
5. **Use of XAFS/basic principles and PES using synchrotron**, Dr. Sambhu Nath Jha, Scientific officer/H, Raja Ramanna Center for Advanced Technology, Indore
6. **Synthesis and characterisation of nanopowders of functional oxide materials employing a novel alginate method**, Dr. Girish Kale, Faculty of Engineering and Physical Sciences, School of Chemical and Process Engineering, University of Leeds, Leeds, United Kingdom
7. **Novel Composite Magnetic Materials for Technological Applications**, Dr. Maoranjan Kar, Associate Professor, Department of Physics, IIT-Patna, Patna
8. **Functional Composite Materials for Sustainable Energy Applications**, Dr. Maoranjan Kar, Associate Professor, Department of Physics, IIT-Patna, Patna
9. **Quest for GREEN ENERGY**, Dr K L Yadav, Professor, Department of Physics IIT-Roorkee, Roorkee
10. **What is all the Fuss about Nanotechnology?** Dr K L Yadav, Professor, Department of Physics IIT-Roorkee, Roorkee
11. **Photorefractive Optics**, Dr Naveen Kumar Nischal, Associate Professor, Department of Physics, IIT-Patna, Patna

12. **Mental Health and Stress Management**, Dr Namita Singh, Neuropsychologist, Apollo Hospitals, Hyderabad, Telangana

13. YOGA..... to be filled