Indian Institute of Technology Indore

Admission to Ph.D. Program

IITI/Acad/Ph.D. Admissions/2013/4th Qtr.

IIT Indore invites applications from highly motivated and research-oriented students for admission to its **Regular Ph.D. Program** in the following disciplines and area of specialisation:

Disciplines of Engineering:

• **Computer Sciences and Engineering** • **Electrical Engineering** • **Mechanical Engineering**	***Qualifying Degree and Exam*** 1. Minimum first class* Master degree in the relevant branch of Engineering/Technology, **OR** 2. Minimum first class* Bachelor degree in engineering or technology from a reputed Institute with a **valid GATE score**, **OR** 3. B. Tech. degree from an Indian Institute of Technology (IIT) with a minimum CPI of 7.0 **OR** 4. Minimum first Class* Master degree in a relevant branch of Science with **valid GATE** qualification **OR UGC/CSIR-JRF** qualification **OR** equivalent fellowship
Area of specialisation	
Computer Sciences and Engineering	Algorithms, Artificial Intelligence, computational learning/ Intelligence, soft computing, Datamining, Service-Oriented Systems, Hybrid neural nets, Evolutionary Computation, Human Computer Interaction, Pattern Recognition, Computer Architecture, Databases, Natural Language Processing, Embedded Systems, Computer Networks, Cloud Computing etc.
Electrical Engineering	**Microelectronics / Nanoelectronics:** Electronic and opto-electronic devices, Hybrid bio-nano devices, Material growth and characterizations. Device Modeling: MOS Devices Modeling (Double Gate, FinFETs, Tunnel FET, Gate-All-Around structure etc.). Circuit Design: Ultra Low Power SRAM Memory Design using CMOS and Advanced CMOS Devices (FinFETs, Tunnel FET etc.). FPGA based Design: Power Reduction Techniques in FPGA and FPGA based System Design. Solid-State Devices (MOSFETs, HFETs), Circuit Design and Nanotechnology, Low Power Analog/RF/Logic Technology Applications, Capacitorless DRAM. Phase change random access memory devices, Vertically stackable cross-point phase change memory devices. 1) Organic electronic/photonic devices and their applications viz. OFETs, OSCs and OLEDs etc. Photoluminescence spectroscopy, thin film fabrication/characterization. 2) Si nano devices, Single electron devices, Bulk and SOI MOSFETs, Low frequency noise in MOSFETs, MOSFET based sensors, Low power information processing circuits and RF-SET. **Communication and Signal Processing:** Cooperative communications, Relaying and diversity techniques, MIMO systems, Cognitive radio. Statistical and Adaptive Signal Processing, Digital Communications, MIMO, OFDM, Channel Coding, Cognitive and Cooperative Communications. 1. Biomedical Signal Processing 2. Speech Signal Processing 3. Nonstationary Signal Analysis **Biomedical Instrumentation**: Bio-Instrumentation, Optical instrumentation, Photonics, Biophotonics.
Mechanical Engineering	**Design Engineering:** Condition monitoring, Noise and vibration, Signal processing of rotating machines, Dynamic modelling. **Thermal Engineering:** Desiccant cooling, heat transfer in microchannels, Biofuels, Heat Transfer, Thermal Engineering, Computational Fluid Dynamics (Bluff body flow, Heat transfer in porous media, Nanofluids, Biofluid Mechanics, Non-Newtonian fluid mechanics). **Manufacturing Engineering:** Mechatronics system design, Laser assisted micro-processing, Smart materials and Structures, Advanced and Hybrid Machining Processes, ECH, Repair of Moulds and Die using Micro-manufacturing processes

Disciplines of Basic Sciences:

• **Chemistry** • **Mathematics** • **Physics**	**Qualifying Degree and Exam** 1. Minimum first class* Master degree in a Science with valid GATE score or UGC**/**CSIR-JRF or equivalent fellowship, **OR** 2. Minimum first class* Master degree in relevant branch of Engineering/Technology, **OR** 3. B.Tech. from an Indian Institute of Technology (IIT) with a minimum CPI of 7.0.
Area of specialisation	
Chemistry	**Physical Chemistry:** Nanostructured Materials, Polymer composites, Biomimetic materials chemistry, self and directed assembly of organic-inorganic materials. Single molecule spectroscopy, Fluorescence imaging. Study of different biological systems by fluorescence spectroscopy. **Inorganic and Organometallic Chemistry:** Transition-metal coordination chemistry, Organometallic chemistry. Structural Reactivity of Metal Chalcogenized Clusters with Metal Acetylides, Coordination Polymers, Inorganic co-crystals and Single-Crystal to Single-Crystal Transformation. Synthetic organometallic and coordination chemistry of transition metals, Nanoparticles and catalysis **Organic and Medicinal Chemistry:** Organic Synthesis, Peptide and DNA based nanostructured materials, Biosensors. Development of new organic/inorganic materials for Photonic and electronic applications. Asymmetric synthesis, Metal mediated synthetic transformation, Green chemistry, Total synthesis of biologically active compounds. Synthesis of natural products, heterocycles and carbocycles, Construction of C-C and C-X (X =N,O,S,P) bonds, diagnostic applications of new targeting ligands for cancers and inflammatory diseases, synthesis of Inhibitors for drug targets, drug delivery systems, near-infra red fluorescence, nuclear Imaging and bio-conjugate chemistry. **Theoretical and Computational Chemistry:** Computational Chemistry, Structural evolution of Nanoclusters and Nanoalloys, Global Optimization Methods, Algorithms for predicting Transition State, DFT Guided Monte Carlo Simulations. Computational Material Science, Atomistic Modelling on Clean Energy Materials, Hydrogen Storage and Production (Photo catalysis) Li-ion Batteries, Fuel Cell, Surface Catalysis, Molecular Electronics.
Mathematics	Algebra, Numerical Linear Algebra, Harmonic Analysis, Mathematical Logic.
Physics	Experimental condensed matter physics, Experimental and theoretical high energy physics, Astrophysics, Complex systems, nonlinear dynamics.

Disciplines of Bio Sciences and Bio Engineering:

Qualifying Degree and Exam
1. Minimum first class* Masters degree in engineering (Computer Science and Engineering, Biomedical, Electronics, Mechanical, Chemical, Aerospace, Biotechnology, Signal Processing, or any relevant branch with knowledge in Optics and basic biology) **OR** **2**. Minimum first class* bachelors degree in engineering (Computer Science and Engineering, Electrical, Biomedical, Electronics, Mechanical, Chemical, Aerospace, Biotechnology) with a valid **GATE** qualification **or UGC/CSIR-JRF or** equivalent fellowship **OR** **3.** B. Tech. degree from an Indian Institute of Technology (IIT) with a minimum CPI of 7.0 **OR** **4.** Minimum first class * masters degree in Science (Chemistry, Biochemistry, Microbiology, Biomedical Science, Applied Mathematics, Mathematics, Physics, System Biology, Bioinformatics, Computer Science, Life Sciences, Biotechnology, Biophysics) **valid GATE** qualification or **UGC/CSIR-JRF** qualification or equivalent fellowship.
Area of specialisation
Biofluid mechanics, Biomedical Signal Processing, Biophotonics, Biosensors and Bioelectronics, Chromatin structure and gene regulation, Computer Based Drug Design (SBDD/FBDD), Cytoplasmic flows, Detection and role of delay in large extended systems, Disease spreading, co-evolution and adaptation, Drug delivery systems, NIR imaging & Bio-conjugate technology, Human Factors, Immunotherapy and targeting ligands for cancer and inflammation, Molecular Biology, Molecular Immunology, Molecular Modelling for Biological System, NMR Spectroscopy, Non-Invasive Characterization and Disease Diagnosis, Nuclear imaging-PET, SPECT and scintigraphy, Photothermal response and photothermal imaging, Photo-acoustic microscopy for biomedical applications, Proteomics, Raman imaging and Spectroscopy, Somatic hypermutation of immunoglobulin genes, Spectral analysis of gene expression profile of zebra-fish under various toxic/environmental perturbation, Spectral properties of directed networks, Structural Biology, Synchronization of coupled dynamics on networks and its application to neurosciences, Target Identification and Drug discovery for different diseases, Computational Fluid Dynamics.

School of Humanities and Social Sciences:

	Qualifying Degree and Exam
• **Philosophy** • **English** • **Economics** • **Psychology** • **Sociology**	1. Minimum first Class* Master degree in relevant discipline of HSS with UGC-JRF qualification or Equivalent Fellowship, **OR** 2. Minimum first Class* in the course work component (if any) of the M.Phil. degree in relevant discipline of HSS, **OR** 3. B.Tech. from an Indian Institute of Technology (IIT) with a minimum CPI of 7.0. **OR** 4. Minimum first Class* Master degree in Science/Engineering/Environmental Science/International Business with UGC-JRF qualification or equivalent Fellowship may also be considered.
Area of specialisation	
Economics	Monetary Economics and Financial Economics
English Literature	Post-Colonial Studies, Indian Writing in English, Digital Humanities
Sociology	Water Management, Sustainability Studies
Psychology	Human Factors, Human Computer Interaction, Applied Cognition
Philosophy	Social-Political Philosophy, Ethical naturalism, Philosophy of Slavoj Zizek
Note: These are the focus areas, but students from other fields close to these mentioned above may also apply.	

* The first class is defined as
(i) 60 % marks for GEN/OBC (55% for SC/ST) category in aggregate or as specified by the university/institute , **OR**
(ii) CPI/CGPA of 6.0 for GEN/OBC (5.5 for SC/ST) category on the scale of 10; with corresponding proportional requirements when the scales are other than on 10 (for example 4.8 for GEN/OBC category (4.4 for SC/ST) on a scale of 8) , **OR**
(iii) A first class as specified by the University/Institute awarding the degree.

Time Schedule: Following is the time schedule for the Ph.D. admission process.

Last date of submission of application through ON-LINE	31 October 2013
Last date of receipt of hardcopy of application submitted online[#]	7 November 2013
Last date for accepting the admission Offer	25 December 2013
Date of Orientation and Registration Programme	2 January 2014

*# Applications received after **7 November 2013** will not be considered.*

Categories of Admission:
The Ph.D. programme is FULL-TIME (except MS category) and offered under the following categories:

- **FA**: Fellowship Awardees with Scholarship as per the rules of the Funding agency.
- **TA:** Teaching Assistantship with scholarship as per MHRD guidelines.
- **SW:** Sponsored from the reputed Industrial or Research organization WITHOUT any scholarship from the Institute.
- **MS:** Military Service Personnel (can be Part-Time also).

Application Procedure:

- Application must be submitted ONLINE through our website (http://academic.iiti.ac.in:8080/nregistration.jsp).
- After Submitting the application online, the same is to be downloaded and the **signed hard-copy along with recent photograph, and Self-attested relevant Certificates, NOC (for SW candidates) and Documents** must be sent to the Address for the Correspondence.
- ***Application of the candidates who ONLY submit online application and do not send the hardcopy by the deadline will NOT be considered for further processing.***
- The **envelope of the application** must CLEARLY be super scribed with ***"APPLICATION for ADMISSION in Ph.D. Program in <name of the discipline> for AY 2013-14"***

Application of respective discipline must be submitted to:

Name of the Discipline	Name of the DPGC Convener	Address for Correspondence
Computer Sciences and Engineering	**Dr. Kapil Ahuja**	Indian Institute of Technology Indore PACL Campus, 113/2-B (Opp. to Veterinary College), Indore-MHOW Road, Indore - 453 446 Madhya Pradesh - India
Electrical Engineering	**Dr. Shaibal Mukherjee**	
Mechanical Engineering	**Dr. Devendra L. Deshmukh**	
Bio Sciences and Bio Engineering	**Dr. Sharad Gupta**	
Chemistry	**Dr. Satya S. Bulusu**	Indian Institute of Technology Indore IET-DAVV Campus, M-Block, Khandwa Road, Indore - 452 017 Madhya Pradesh - India
Mathematics	**Dr. Swadesh Kumar Sahoo**	
Physics	**Dr. Subhendu Rakshit**	
HSS	**Dr. C. Upendra**	

Joining the Ph.D. program:

The selected candidates can join the Ph.D. program after last date of accepting the offer but, Registration to Ph.D. program will be done only twice in an academic year on the scheduled date of Registration i.e. (i) in the Autumn Semester for the candidates selected in the **1st and 2nd quarter**, (ii) in the Spring Semester for the candidates selected in the **3rd and 4th quarter**.

Also, such candidates will get the Ph.D. scholarship for a Maximum duration of FOUR years (for MTech/ME/MPhil qualified candidates) or **FIVE years** (for MSc/MA/MCom/MBA/BTech/BE qualified candidates) **from the date of joining the Ph.D. Program (for the TA category) OR as per the guidelines of the Funding Agency (for FA category).**