



Doctoral Programs in

- Computer Science & Engineering
- Electronics and Communication Engineering
- Mechanical Engineering
- Pharmaceutical Sciences
- Health Sciences
- Applied Sciences
- Education

Master of Engineering Programs in

- Computer Science & Engineering
- Electronics and Communication Engineering
- Construction Technology and Management
- Mechanical Engineering



CHITKARA
UNIVERSITY

Hello future.

**SMALLER
CLASSES FOR
BETTER LEARNING**

OUR WAY OF
LEARNING IS

**HANDS-ON
COLLABORATIVE
INTERACTIVE**



THEORIES ARE BROUGHT

TO LIFE

AND YOU LEARN BY
EXPERIENCING THEM.



CURIN

Chitkara University
Research & Innovation
Network

Chitkara University Research and Innovation Network (CURIN):

CURIN was established in July 2014, with a clear objective to bring all research related activities under one umbrella and to provide conducive environment for healthy and ethical research practices and to promote product-oriented development.

The mission of CURIN is

- To promote interdisciplinary and applied research beneficial to our University, Society, National and International Community
- To incorporate and inculcate inclusive research habits – with innovative streak – at all levels of students, employees and faculty

Constituents @ CURIN

- Office of Patent Facilitation Licensing and Consultancy
- Centres for Advanced Research
- Masters of Engineering Programs
- Doctoral Research Centre
- Centre of Excellence for Entrepreneurship Education



RESEARCH CENTRES AT CURIN

MISRC (Micro Electronics and Information Systems Research Centre)

CRPLM (Centre for Research in Product Life Cycle Management)

RPMS (Research Centre for Physical and Mathematical Sciences)

CRNSS (Centre for Research in Natural and Social Sciences)

CACR (Centre for Advanced Computing Research)

CrEiLa (Centre for Research in Education Innovation and Learning Analytics)

CENT (Centre for Research Excellence in Nano Technology)

CRPS (Centre for Research in Pharmaceutical Sciences)

GIBTRC (Geo- Informatics and Building Technology Research Centre)

IAER (Institute of Advanced Energy Research)

HC (Health Catalyst)



EXPLORATION AND INNOVATION

The Research scholars become a part of CURIN on the day of enrollment. They must have the ability to think for themselves and must have that drive—the need to investigate and ferret out solutions, to build, to invent, to design, to develop. They become passionate and focused, while working on the research projects assigned to them. Not only do we recognize it, we welcome them to bring it on! We prioritize teaching students - how to bring their ideas to fruition, not just by enhancing research skills, but by teaching them how to foster innovation and to manage the process, to take ideas to the highest possible level.



INTELLECTUAL CURIOSITY

At Chitkara, we expect our research students to be dwelling more than just on their course schedule and books. We want them to get their hands dirty. All our students become a part of CURIN the day of their enrollment. They are allotted research and consultancy projects besides teaching assignments and thus are given opportunities to work with leading researchers. They even get funded for supporting their own research ideas and bring them to reality.



BLENDED LEARNING

At CURIN we challenge our scholars with blended learning models. The pedagogy is a balanced mix of On-line, Problem Based Learning, Project Based Learning, Classroom teaching and Lab sessions. Experiential Learning becomes the base line for all our research programs. The students enjoy thinking, doing, applying and solving real world problems.

RESEARCH, LEARN, DO

All our research scholars are expected to strike a balance in teaching, learning and research. We realize at CURIN that no teaching is complete without research and no research is complete without teaching. Thus the students are given teaching assignments and are given research projects to learn to balance both and apply the knowledge thus gained from one area to the other.



AN EDUCATION AHEAD OF ITS TIME

At Chitkara University, our research scholars receive a quality education that prepares them to advance their frontiers of technology. Through our Hand-on curriculum based on Blended Learning model, students work on live research and consultancy projects with senior researchers and industry to give solutions to real life problems and those driven by cutting edge technology.

WE LET YOU EMBARK ON RESEARCH FROM DAY ONE.

We believe every student benefits from being taught by experts active in research and practice. You will discuss the very latest ideas, research discoveries and new technologies in seminars and in the field and you will become actively involved in a research project yourself. All our academic staff are active in internationally-recognised scientific research across a wide range of topics. You will also be taught by leading industry practitioners.

There are always numerous research projects in progress, funded by industry, charities, government departments and research councils. Our research scholars benefit through access to up-to-date equipment, industrially linked projects and staff expertise.

CHITKARA UNIVERSITY RESEARCH & INNOVATION NETWORK (CURIN)

Through **Chitkara University Research and Innovation Network (CURIN)**, our researchers, staff and students work across disciplines to extend the boundaries of knowledge. 11 Centres of advanced research under CURIN build and sustain Chitkara University's competitive advantage through leadership. These centers and institutes are the locus of research for collaborative groups of investigators pushing the frontiers of knowledge forward. They are involved in cutting edge research, exploring new technologies to improve the country's infrastructure and safety — and contributing to society through many other discoveries and innovations.

SOME FOCUS AREAS IN RESEARCH

Sustainable Software Development:

Sustainability and sustainable development have become pressing concerns over the last several decades. Software systems strongly affect our everyday lives in many aspects and in varying contexts. Consequently, supporting sustainability in software engineering explicitly is likely to have a substantial impact on making our planet greener in the long run and improving our communities as well as our environment. At CURIN – CACR (Centre for Advanced Computing Research), projects are going on to support the dimensions of sustainability - human, social, economic, environmental, and technical - within different phases of the software lifecycle, with a focus on requirements engineering (RE) and quality assurance (QA).

Effective Cloud Management:

Resource management in a cloud environment is a hard problem, due to the scale of modern data centers; the heterogeneity of resource types and their interdependencies; the variability and unpredictability of the load; as well as the range of objectives of the different actors in a cloud ecosystem. Consequently, both academia and industry began significant research efforts in this area. A few of the ongoing projects at CURIN-CACR (Centre for Advanced Computing Research) are aligned to provide solutions for effective cloud resource management

Assistive Technologies for differently-abled:

Technology has changed the way learning is created and consumed in the 21st century. It has also brought in tremendous possibilities to create 'inclusive' learning that takes into consideration the special needs of differently abled learners - in educational institutes as well as corporate organizations. At CURIN – CACR (Centre for Advanced Computing Research), we work to develop solutions to help the learners access learning material as well as contribute actively to gain an immersive experience. With the help of Assistive Computer Technology (AT) anybody – irrespective of any disability – can effectively interact with a computer. We work in the areas of Speech-to-text transcribers, Text-to-text transcribers, and developing visual, audio and physical aids for these differently-abled persons, thus creating avenues for two-way interaction and participation as well.

Assistive technologies for better health care:

Smartphones can monitor many of your vital signs at home—and do it more cheaply than your doctor. But will technology deliver better medical care?

At CURIN – Center for technologies for better health care we strive to answer this and many other questions. Researchers from College of Health Sciences, School of Computer Science Engineering and School of Applied sciences came together to work with leading hospitals, clinical practitioners, biochemists and genetic scientists from research labs in the region to discover newer pathways to solve the mysteries of Type II Diabetes and use bioinformatics principles to simulate them to find answers to ever intriguing protein mis-folding mechanisms. Novel technologies are getting invented in the centre to bring better technologies to healthcare professional and in turn to the patients.

Microwave impedance spectroscopy with electrode characteristics enabling wave penetration of conducting skin depth (Human skin tissue) and 6-port reflectometer are being designed. Master students are working on Industry sponsored projects to find out retinal blood vessel parameters from fundus images giving better insight into Retinal images and linking them to pre-diagnostic stages.

Precision Farming:

Increased use of chemicals in form of fertilizers, insecticides and pesticides has raised health issues in farmer and consumers. Also, the climate changes and conventional farming methodologies have resulted in reduced crop yield. These challenges drive the need of precision farming by designing corresponding mechanized solution for each process. In our Microelectronics and Information Systems Research Centre (MISRC), we use technology to develop all terrain robot and using smart sensors for weed control.

We use hydroponic farming to develop vertical farms and use technology to monitor the conditions of plants therein. Students and faculty from faculty of pharmacy, civil engineering and Computer sciences come together to better these farms on a continuous basis.

Human Computer Interaction:

How can humans communicate with computers better and vice versa? At Centre of Excellence in Education Innovation and Learning Analytics (CURIN – CrEiLa) we are harnessing the power of Augmented Reality to develop teaching aids for Engineering education and K -12 education. We use the ARLE (Augmented Reality Learning Environment) to improve concept visualization of students and also improve their skills in Engineering and Sciences.

Image Processing:

Researchers at Microelectronics and Information Research Centre (MISRC) use latest tools and techniques of image processing for character and text recognition, sign language interpretation, plant disease detection and other ever growing related applications.

Network Security:

The purpose of network security is essentially to prevent loss, through misuse of data. There are a number of potential pitfalls that may arise if network security is not implemented properly. At CURIN – CACR (Centre for Advanced Computing Research), we work to develop solutions to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources. We work to develop state of the art Intrusion Detection System (IDS) to mitigate the effect of intruders on corporate networks. We also work to propose novel concepts like Machine Learning in the state of the art research on IDS.

Mobile Adhoc Network:

Today security is the biggest challenge in mobile adhoc networks. At CURIN – CACR (Centre for Advanced Computing Research), we work to develop solutions for distributed key management that uses numerical methods. We use polynomial interpolations to apply distributed key management and the students are encouraged to implement the concepts in Android applications or respective simulators.

Design, Manufacturing and Product Development:

In the Design research area, everything from a steam turbine to a robot is conceived, designed, Fabricated, assembled, and delivered by an engineer who understands design, manufacturing, sustainability, and the supply chain. At Chitkara University we work on precision machining, machine design, product design and development, environment and sustainability, information and sensing, manufacturing process, and systems.

Sustainable Energy Development:

The Energy area focuses on technologies for efficient and clean energy conversion and utilization, aiming to meet the challenge of rising energy demands and prices, while simultaneously addressing the environmental issues. We at Chitkara University, work on engines, transportation, combustion control, Hydrogen research, electrochemical energy storage and energy conservation.



DOCTORAL PROGRAMS

PhD Programs

We offer following PhD programs under CURIN:

Regular PhD (Get full time employment with CURIN) (Eligibility - Post Graduation)

- Electronics and Communication Engineering
- Computer Science and Engineering
- Mechanical Engineering (ME)

External PhD (For external candidates employed full time with industry / academia / research labs)
(Eligibility – Post Graduation)

- Computer Science and Engineering (CSE)
- Electronics and Communication Engineering (ECE)
- Mechanical Engineering (ME)
- Applied Sciences
- Pharmaceutical Sciences
- Health Sciences
- Education

Direct PhD (Integrated ME - PhD) program (Eligibility - Bachelors degree)

- Computer Science and Engineering (CSE)
- Electronics and Communication Engineering (ECE)
- Mechanical Engineering (ME)

Regular PhD program / PhD (Fellowship)

Program Objectives

The regular doctoral program is different than a traditional PhD program. It is uniquely designed for promising professionals, who wish to pursue their careers in applied research and who seek the advanced knowledge, skills and perspectives of doctoral education.

Program Mission:

The Mission of our regular Doctoral Program is to enable researchers with inquisitive minds to build their careers in one of the applied research areas. We infuse them with theoretical knowledge to conceptually understand cotemporary issues in education, science and technology and simultaneously apply them to develop cutting edge technologies so as make a positive impact on the society. This enables them to do better problem solving and generation of workable solution to the complex real – life problems.

Educational Objectives:

The educational objectives of our regular doctoral program are to enable students to:

- a) Apply theoretical and analytical competency in one of the research areas of CURIN, by working on funded projects with one of the advanced researchers.
- b) Exhibit analytical and research skills necessary to create knowledge and apply it to emerging research problems.
- c) Demonstrate expertise in specific topic through the design, execution and completion of doctoral dissertation that contributes to the knowledge and practice of the field.

Admission Eligibility:

A candidate is eligible for Admission and Registration for PhD program provided he/she has qualified:

- a) For the award of Master's Degree of any recognized University/other qualification in a relevant discipline. The minimum qualifying marks are 60% at Post Graduation level (55% in case of reserved categories

And

- b) In the Entrance Examination conducted by the University at the national level on the pattern of UGC followed by interview.

Age Limit: Candidate must not be more than 55 years of age on the date of the entrance test.



External PhD program / PhD (part time)

Program Objectives

The doctoral program is uniquely designed for accomplished executives / academicians, who seek the advanced knowledge, skills and perspectives of doctoral education without interrupting their careers.

Program Mission:

The mission of our external PhD Program is to enable successful professionals to pursue their academic career by infusing them with theoretical knowledge to conceptually understand contemporary issues and develop enhanced research skills. This enables them to do better problem solving and helps them in generating optimized solution to the complex real life problems.

Educational Objectives:

The educational objectives of our external doctoral program are to enable students to:

- a) Apply theoretical and analytical competency in own working and functional area.
- b) Exhibit analytical and research skills necessary to create knowledge and apply it to emerging research problems.
- c) Demonstrate expertise in specific topic through the design, execution and completion of doctoral dissertation that contributes to the knowledge and practice of the field.

Admission Eligibility:

A candidate is eligible for Admission and Registration for PhD program provided he/ she has qualified:

- a) For the award of Master's Degree of any recognized University/other qualification in a relevant discipline. The minimum qualifying marks are 60% at Post Graduation level (55% in case of reserved categories)
- And
- b) In the Entrance Examination conducted by the University at the national level on the pattern of UGC followed by interview.

Age Limit: Candidate must not be more than 55 years of age on the date of the entrance test.



Direct PhD (Integrated ME – PhD) Program

Program Objectives

The doctoral program is uniquely designed for students who have earned their bachelor's degree and have realized that they have a research bent of mind. This program gives them an opportunity to seek admission into this program and earn a direct PhD degree.

Program Mission:

The mission of our Direct PhD Program is to mentor academically acclaimed students to embark on extremely rewarding research path and work for their doctoral research. An early entry will not only help them to keep their focus but also enable them to contribute to the research projects of societal importance with problem solving approach.

Educational Objectives:

The educational objectives of our Direct PhD program are to enable students to:

- a) Apply theoretical and analytical competency in one of the assigned areas of research.
- b) Learn and practice analytical research skills necessary to create knowledge and apply it to emerging research problems.
- c) To continuously innovate and keep in touch with the latest industrial trends
- d) Demonstrate expertise in specific topic through the design, execution and completion of doctoral dissertation that contributes to the knowledge and practice of the field.

Admission Eligibility:

A candidate is eligible for Admission and Registration for PhD program provided he/ she has qualified:

- a) For the award of Bachelor's Degree of any recognized University/other qualification in a relevant discipline. The minimum qualifying marks are 60%. (55% in case of reserved categories)

And

- b) In the Entrance Examination conducted by the University at the national level on the pattern of UGC followed by interview.

Age Limit: Candidate must not be more than 30 years of age on the date of the entrance test

Exit Option:

After first two years of course work, the students have to appear for an aptitude test to continue their PhD. Only successful candidates go on to complete their PhD program. Rest of them take an exit option to earn a Masters degree by completing dissertation with a parallel batch of ME students.

Academic Framework of Regular & External Phd programs

Deliverable – 1 | Submission of Application Form

Deliverable – 2 | Acceptance by Chitkara University

After acceptance of the form, the admission process will be as follows

- a) Written test
- b) Personal Interview

The syllabus of written test is communicated to the candidates on e-mail.

Deliverable – 3 | selection for Doctoral Program

Once you are selected for the Ph.D Program at Chitkara University, you would need to deposit a fee of Rs.50,000/- towards registration and commencement of your course.

Deliverable – 4 | Coursework

Every candidate should complete four courses before working on Doctoral Dissertation. Every course is held twice in a year and on the weekends. Course work dates for the year are announced ahead of schedule so that one can plan well in advance. Each course will normally be for four days duration including the weekends.

Deliverable – 4(a) | Research Methodology

Deliverable – 4(b) | Advanced Research Methodology

Deliverable – 4(c) | Doctoral Foundation Seminar

Deliverable – 4(d) | Doctoral Concentration Seminar

Deliverable – 5 | Finalization of Research Proposal and Approval

This commences immediately after a candidate successfully completes the course work (i.e. Deliverable 4). A suitable research supervisor is allotted and the following process is followed for smooth :

- Extensive review of literature under guidance of the thesis guide.
- Selection of a topic and alternative topic.
- Preparation of research proposal
- Presentation research proposal to the Doctoral Research Committee (DRC)
- Approval of proposal and commencement of research

Deliverable – 6 | Progress Review Seminars

The candidate approaches the guide for a suitable schedule after the deliverable 5. A minimum of three progress seminars are held to assess the progress of the candidate in his/her chosen research area.

Deliverable – 7 | Publishing Tutorials

Each doctoral candidate is expected to publish a minimum of one research article in a domain specific journal during the entire research period. Progress seminars and the mentoring by DRC are useful to prepare such articles.

Deliverable -8

Deliverable 8(A) | Final Thesis Submission

Deliverable 8(B) | Defence of Thesis


Deliverable 8(C) | Award of Degree and Convocation at the campus

Program Structure of Regular & External PhD programs:

The Doctor of Philosophy curriculum includes compulsory course work, preparing research proposal and objectives, research work and progress, pre thesis and thesis defense.

The course work is composed of four components, namely, Research methodology, Advanced Research methodology, Doctoral Foundation Seminar and Doctoral Concentration Seminar. After successful completion of coursework, the research scholar works in close coordination and under strict supervision of his / her research guide and prepares the research proposal and identifies the objectives of the research work. Progress of the research work is reviewed every six months and finally the scholar submits his thesis and defends it. The Doctoral Research Committee (DRC) closely mentors and monitors this whole process.

Phase	Sub components	Outcome
Coursework	Research Methodology	Enabling scholars to pursue research in a methodical manner
	Advanced Research Methodology	Enabling scholars to know about tools and technologies to process their data
	Doctoral Foundation Seminar	Enabling and equipping scholars with required tools and technologies in their broad discipline area
	Doctoral Concentration Seminar	Motivation to Research, b) identification of base paper(s), c) State-of-art, d) Identification of research gaps, e) Identification of Tools/ technologies for conducting proposed research
Submission of Research . Proposal		Extensive literature review / patent data bases, research proposal submitted to Dean (DRC) in prescribed format
Progress Seminar – I		Progress on identified research objectives
Progress Seminar – II		Progress on identified research objectives
Progress Seminar – III		Progress on identified research objectives
Pre Thesis Seminar		Achievement of all objectives, Thesis ready in final shape, Research paper(s) communicated to Conferences / Journals
Thesis Submission and defense		Eligibility for award of PhD degree



**BIG
OPPORTUNITIES
AWAIT OUR
STUDENTS
WITH OPEN ARMS ...**

Strong academic legacy, personal attention, rigorous technical training in a challenging environment, outstanding research faculty and a great place to study are just some of the highlights of the academic framework at CURIN. We have established an unassailable reputation for very strong research and academic collaborations by sheer virtue of our intensive focus on making graduate students problem solvers.

CHITKARA UNIVERSITY 

Welcome to the M.E. Program at Chitkara University, an exceptional program to advance your skills and accelerate your career in the field of applied engineering. Masters from Chitkara University not only ensures hallmark education standards but also apex professional training imbued with latest techniques and technologies.

Our mission

Our mission is to provide students with a deep foundation in engineering concepts alongwith required essential skills for a successful career in academia and research. To cope up with the ever changing engineering world, our curriculum is grounded on state-of-art engineering technologies and research problems. Our expert pool of academicians, researchers and industry experts is exemplary in imparting knowledge through advanced laboratory equipment and mentoring research oriented problems.

Our philosophy

We strive to offer a personalized, flexible, challenging, and rewarding educational programs, based on contemporary engineering needs and technologies. In doing so, we emphasize on the enduring foundations of the field and adhere to a pragmatic style of instruction blended with the best of art and science of engineering.

Our coursework

Our coursework offers a realistic balance between the foundation courses and applied courses. Foundation courses such as mathematics, programming concepts and computer systems etc. are meant to coagulate the primary engineering concepts of the domain, chosen by the student. The applied courses can either be chosen in accordance to the field in which an aspirant student is working or it can be chosen from listed options which are offered and designed to gain expertize in extending and implementing foundation courses.

Our distinguished faculty

Chitkara University is proud to have a team of renowned researchers and skilled technocrats as its faculty. Our collaborations with industry giants offer trainings, technologies and resources from the partner organizations, so as to make our students industry ready. Students have numerous opportunities to interact with and learn from our in-house faculty and industry experts from partner organizations.

As a M.E. student

Being a Masters student at one of the world's premier university, you will be a member of unique and distinguished intellectual community and enjoy the many benefits of academic life offered by Chitkara University. A Masters degree from Chitkara University, will not only signify to the academia / research community and industry your deep understanding of the foundations of applied engineering but will also attest to your new and critical skills in the evolving field of technology. We truly live in a technology-driven world where in-depth technical knowledge, advanced skills and forward-thinking philosophies are essential for taking your career to the next level!

We hope that you will consider our graduate program for your studies and we look forward to welcoming you to our community.



Research Induced Fellowship Program for Master of Engineering (RIFP-M.E.)

At Chitkara University, we offer unique Research Induced Fellowship program (RIFP) for Master of Engineering (M.E.) in

- Computer Science & Engineering
- Electronics & Communication Engineering
- Construction Technology & Management in collaboration with ACC Limited
- Mechanical Engineering

The aim of this program is to give the aspiring University teachers a broad theoretical knowledge imbued with deep research understanding. It will enable students to tackle practical complex problems of design and development in industrial fields, and to deep dive into research areas of their interest. Some other highlights of the program are:

- On admission, the students are simultaneously hired on Research Assistant / Teaching Assistant role, for which they are paid performance-linked stipend.
- On successful completion of the program, the students have the option to choose (based on selection criteria)
 - Direct entry into the Fellowship PhD program of the University, where they work as Research Associates in CURIN (Chitkara University Research and Innovation Network)or
 - Teaching career with School of (Electronics & Electrical Engineering / Computer Science & Engineering / Civil Engineering / Mechanical Engineering)
- At the end of second year, the students can exercise option to take direct admission into PhD(Fellowship) program of the University



CURIN

Chitkara University
Research & Innovation
Network

Chitkara Institute of Engineering & Technology

Chitkara University (Punjab)

Chitkara Institute of Engineering & Technology established in the year 2002, has become the first choice among the student community in North India and this fact has been reinforced by CIET being consistently ranked in the top 50 private Engineering colleges in the country. With the establishment of Chitkara University, CIET became one of its constituent institutions and is now on its way to achieve higher benchmarks in Engineering Education.

CURIN offers following ME programs in association with Chitkara Institute of Engineering and Technology (Chitkara University, Punjab)

3 Years Research Induced Fellowship Program for Master of Engineering

- Computer Science & Engineering
- Electronics & Communication Engineering
- Mechanical Engineering

Chitkara School of Engineering & Technology

Chitkara University (Himachal Pradesh)

Chitkara School of Engineering & Technology (CSET) was established in the year 2008 at Chitkara University (Himachal) and is well on its path to become one of the leading Engineering schools of the country. Since inception, CSET has been at the forefront of forging strong collaborations with companies like ARM, Cadence, Microsoft, ACC, etc. In a short time it has become one of the premier Engineering institutes of North India.

CURIN offers following ME programs in association with Chitkara School of Engineering and Technology (Chitkara University, Himachal Pradesh)

3 Years Research Induced Fellowship Program for Master of Engineering

- Construction Technology & Management



ENGAGING STUDENTS IN RESEARCH ORIENTED EDUCATION

Dedicated research Labs and Industry sponsored Labs allow students to combine their practical and theoretical studies right from on the onset of Masters program. Research projects and engineering design are a part of the course curriculum. Our students have been a part of many novel solution to live problems and in the process have won accolades at National and International levels. Small Classes allow faculty to provide for individual attention. Students learn in small groups, receive hands on experience every semester and contribute to the UG education by assisting senior faculty members.

STRONG INDUSTRY COLLABORATIONS

Chitkara University has very strong industry collaborations with global industry leaders. These companies such as ARM, Cadence, Wipro, Infosys, Oracle, Microsoft, SAP and Dassault Systemes provide a platform for our graduate programs and let the engineers experience the latest technologies hand-on. We are the preferred University for fresher intake for many leading blue chip companies around the country including Microsoft, Google, Amazon and Google. Our Engineering facilities include a number of instructional and research laboratories including the Microsoft Innovation Centre, nVidia CUDA Teaching Centre, NXP Semiconductors Signal Lab and Dassault Design Centre.

A UNIQUE, HANDS-ON LEARNING EXPERIENCE

Hands-on and interactive learning means classes are never dull. Theories are brought to life, and you learn by experiencing them.

Classes incorporate activities, such as simulations and problem sets conducted in the format of mini lectures, video lecturettes, small group recitations, hands-on demos, designettes and concept quizzes to cement the understanding of different concepts in a subject. The interactive sessions foster collaborative learning and you will enjoy and better understand concepts that are traditionally viewed as difficult. Real-life examples are demonstrated regularly.

Students can participate in research projects of national and international research labs and work with blue chip companies such as Google, Texas Instruments & Hewlett Packard (HP) as well as the leading research labs.



STRONG INDUSTRY AND RESEARCH COLLABORATIONS

CURIN has established an unassailable reputation with many MSME and blue chip companies for bringing real life problems to our graduate classrooms, thus enabling our Master programs focus on problem solving. A lot many research labs in the country and outside have granted permission to use their facility for our Master students thus enabling students to pursue their thesis work under joint supervision of a faculty member from CURIN and the other from Industry or research partner.

We realize that our technical graduates are the foundation of the new knowledge based Indian economy. We also know that an active industry academic interface is required to achieve the goal of producing "industry ready" graduates who are well rounded and life-long-learners. For this purpose, linkages have been established with industry partners such as CISCO, CA, Dassault Systems, National Instruments and Cadence Design Systems to develop and deploy industry-relevant curricula on various technologies.

Marquee companies such as nVidia, ARM, cadence, nxP semi conductors, Videocon, Cognizant and Texas Instruments have recently supported us in terms of supplying state of the art equipment for best hands-on training for our students.

- Chitkara University is privileged to be part of the SAP University Alliance.
- We have dedicated Apple funded labs for making our students proficient in IOS mobile applications.
- Microsoft Innovation Centre at Chitkara University provides incubation and expert hands-on support on Microsoft technology innovation, research, and software solutions.
- nVIDIA which is one of the leading companies in the parallel computing space has granted the status of "CUDA teaching Centre" to Chitkara University.
- Marquee companies such as ARM, Cadence and NXP Semiconductors are supporting us in terms of supplying state of the art equipments for best hands-on classroom training.
- Infosys Campus Connect and Wipro 10X Mission has provided us an important framework for our Engineering curriculum
- Strong linkages with Industry leaders such as CISCO, Ericsson & National Instruments to develop and deploy industry-relevant curricula on various technologies for our Engineering curriculum.
- Tata Technologies and Dassault Systemes lend their technical plus software knowhow to set up a brilliant lab for design, manufacturing and documentation to cater to the rising demands of designers, analysts in the Automotive industry.
- Autosync has collaborated with Steinbeis Centre for Technology Transfer India, which aims to bridge the world of science, academia, and business articulately.
- Mahindra Rise Igniters have collaborated with the centre forming "Igniters Innovation Lab".
- BOSCH Aftermarket - Automotive Testing equipment's and theories which the students shall undergo to form a more coherent linkage with what they have taught.
- RASCO Auto and LMI Technologies, U.S.A. associated with the centre to initiate a state of art Laboratory for "Reverse Engineering and 3D Scanning" Technology development. Autosync stands synonymous to Innovation, Technology Transfer, Live Project management.
- Strong linkages with national and international research labs give our Master students an opportunity to work on jointly supervised projects with these labs.





Certificate of Accreditation

Wipro Technologies

Is proud to honor and accredit

Chitkara University, Chandigarh

as a

TRUSTED ACADEMIC PARTNER

By virtue of having met the qualifying standards of excellence in

Wipro's Institutional Accreditation Framework and providing

talent of the highest caliber




Girish S Paranjpe
Joint CEO
Wipro Technologies


Suresh Vaswani
Joint CEO
Wipro Technologies


Pradeep Bahirwani
Vice President
Talent Acquisition

Wipro Technologies has been hiring Engineering graduates from Chitkara Institute of Engineering and Technology for the last three years. Looking at the academic standards and performance of our alumni, Wipro Technologies has conferred "The Trusted Academic Partner" status to Chitkara University. Our Engineering curriculum now boasts of Wipro's Talent++ series which consists of bouquet of student engagement initiatives exclusively designed for Chitkara University students.



Integrated Circuit (IC) design is a crucial Engineering field, where one has to learn the nitty-gritty involved in designing chips for complex applications. Cadence has its largest market share in design of state of the art EDA tools. Chip design in India has also moved into the big league with multinationals, design services companies, product companies and start-ups in the country growing by the day. Chitkara University has invested in procuring the necessary industry standard tools which enables innovators to design a full-fledged integrated circuit chip right from inception of an idea to layout to customize for the full scale design. Many microelectronic circuits design courses have been embedded into the course curriculum for Electronics and Communication Engineering students.

ARM is the world's leading semiconductor intellectual property (IP) supplier. The technology designed by ARM is at the heart of many of the digital electronic products sold. ARM Technologies has taken an initiative in establishing a Microcontroller laboratory by donating state of the art mbed kits. This enables students to explore their potential and use the latest technologies to build the applications, which can compete with the best in the world.



NXP semiconductors lab has been established by a 4 billion dollar Multi National company with its presence in 25 different countries of the world. NXP Semiconductors provides High Performance Mixed Signal and Standard Product solutions that leverage its leading RF, Analog, Power Management, Interface, Security and Digital Processing expertise. As a part of this laboratory, Chitkara University has been granted state of the art software as well as hardware for realizing various electronic circuit design applications.



Oracle Workforce Development Program (WDP) is one of the most popular database management education programs in the world and we have integrated important elements of WDP in some of our programs.



Mr. Ratan Tata interacting with Chitkara students at Auto Expo where our students got the opportunity to display their design concepts for the next generation automobiles.

Cisco Networking Academy program is an e-learning program that delivers Web-based educational content, online testing, student performance tracking, instructor training and support, as well as hands-on labs. The Networking Academy program combines lectures and online learning with hands-on laboratory exercises in which students apply what they learn in class while working on actual networks. Chitkara University seeks to play a major role to provide individuals the knowledge, and teach problem-solving abilities and critical thinking skills they need to pursue a career in ICT industry in the 21st century workplace. Cisco programs prepare students for industry-recognized certification exams such as the Cisco Certified Network Associate (CCNA), Cisco Certified Network Professional (CCNP), and NetPlus+.





Infosys Campus Connect is an industry-academia partnership initiative taken by Infosys to assist the budding engineers improve their employability skills and make them industry ready. Chitkara has partnered with Infosys for this program to increase competitiveness and to enhance the pool of highly capable talent for growth requirements in IT space.

The courseware comprises of the IP and experience of

Infosys in training thousands of entry-level engineers from diverse backgrounds and disciplines so that they perform their best in delivering world-class projects to global customers.

Chitkara University has integrated the foundation program in the curriculum for all engineering programs which covers essential generic topics like -

- Computer hardware and system software concepts
- Programming fundamentals
- RDBMS
- System development methodology
- Analysis of algorithms
- Object oriented concepts
- User interface design
- Web technologies Client/server concepts



Texas is the company of the world, which boasts of the design of first Integrated Circuit sometime in late 60s. For more than 80 years, Texas Instruments has used increasingly complex signal-processing technology—with advances ranging from the incremental to the revolutionary—to literally and repeatedly change the world. TI has sponsored a full fledged laboratory with grant of beageboard kits, which enables students to fly their imagination and create their own electronics applications.

nVIDIA is a giant company in the design of world class Computers Graphics cards. Founded in 1993, nVidia has continuously reinvented itself to delight users and shape the industry. Of late, they have harnessed the parallel computing capabilities of the GPU to advance high-performance computing and this move from nVidia into mobile domain has put them at the center of one of the industry's fastest-growing segments. Chitkara University has been granted the status of CUDA Teaching Center (CTC) owing to a consistent performance in terms of organisation of large number of workshops on Parallel Programming and also offering courses on most advanced graphics supporting language CUDA.



A RESEARCH & PRACTICE LED CULTURE

SMART HELMET/HAT WITH SOLAR PANEL FOR SECURITY SURVEILLANCE

Satpal Singh student of second year Masters Program in Computer Science under the guidance of Dr. S N Panda and Dr. Archana Mantri filed a patent on Smart Helmet/Hat based on latest Big Data technology using Hadoop Base station and smartphone. This system can be used for surveillance of sensitive and crowded areas. The system is designed to capture live audio/video and transmit it in real-time to HADOOP base station where audio/video analysis will take place. Smart-Helmet/hat is powered using solar panels. It is designed to transmit real-time data using 3G or 4G services to base station.



MICRO ELECTROMECHANICAL SENSORS (MEMS) BASED AUTOMATIC WINDSCREEN WIPER

Hemant Bansal student of Masters Program filed a patent on Micro Electromechanical Sensors (MEMS) Based Automatic Windscreen Wiper under the guidance of Dr. Nitin Saluja and Mr. Vishal Mehta. The design relates to the field of automobile and particularly to the windscreen wiping mechanism. It uses Micro Electromechanical Sensors (MEMS) based automatic windscreen wiper claiming 100% cleaning of windscreen in comparison to 83% cleaning (The best in automobile segment). It is capable of automatically detecting dust and rain and cleans 100% area of the wind screen.



INDIVIDUAL NODE CONTROL MECHANISM FOR CENTRALIZED AIR CONDITIONING SYSTEM AND METHOD OF USE THEREOF

Himanshu Jindal student of Masters Program has developed a system to facilitate controlling of different comfort conditions for individual nodes present in centralized air conditioning system under the guidance of Dr. Nitin Saluja. This patented system provides a solution to individually sense each node connected to centralize AC. The mechanical shutters are present that will shut the duct and energy will be directed to the next node. If all the ducts are sensed shut, AC will go off, which will be the energy saving process. The effectiveness of air conditioning is not affected and there will be uniform cooling in each node.



USER CONTROLLED AUTOMATIC TIMER BASED MOSQUITO REPELLENT DEVICE

Sagar Juneja student of first year Masters Program filed a patent on Automatic timer based mosquito repellent machine which can automatically control the time according to the burst mode selected by the user. An electronic circuit is incorporated into the device that automatically switches on and off the mosquito repellent device depending upon the burst mode selected, thus controlling the release of toxic fumes into the room thus maintaining the quality of breathable air indoor.



ELECTRONICALLY CONTROLLED NURSING BED

Vidhyotma - a Masters scholar in second year under the guidance of Dr. Amitoj Singh filed a patent on electronically controlled nursing bed, helpful for bedridden patients to change their positions automatically or periodically as suggested by doctors. This bed is self-controlled in specific angles/positions/tilt. To prevent patient from bedsores the electronically controlled nursing bed helps the patient to change their position to left, right or at a particular angle by hand gesture control. Apart from bed positioning patient can control room environment like light, fan, window curtain, blanket wrapping by its own, without any attendant/caretaker help. Caretaker/attendant can help patient in his/her bowl movement without lifting the patient from bed. The invention provides sanitary trolley under the bed with switch controlled movement. This bed provides complete patient care and decreases the requirement of the hospital caring staff.



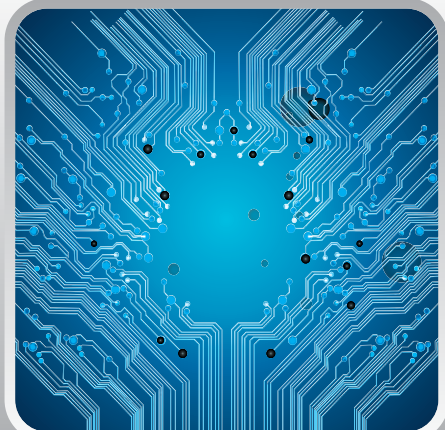
GPHL IO STANDARDS BASED ENERGY EFFICIENT VEDIC MULTIPLIER DESIGN ON FPGA

Kavita Goswami, Masters student integrated the expertise of electronics researcher and Arithmetic Logic Unit to develop low cost, low power and secure hardware based Vedic Multiplier design for applications like Digital Signal processing and filed a patent under the guidance of Mr. Biswajeet Pandey. The Vedic multiplier is designed on the basis of UrdhvaTiryagbhyam sutra of Vedic mathematics. In order to make Vedic multiplier time efficient, speedy and having lesser area, are implemented in Arithmetic and Logical Units replacing the traditional multipliers and squares based on array and Booth multiplication.

In order to make them energy efficient, techniques like voltage scaling, thermal scaling and process variation have been used for LVTTTL, PCI, GTL and HSUL IO standards for energy efficient Vedic multiplier.

Energy Efficient Unicode Reader Design on FPGA

Amanpreet Kaur, Masters student filed a patent that has integrated the expertise of electronics researcher and natural language processing researcher in order to develop faster, low cost, low power and secure hardware based Unicode reader design for 22 languages of eighth schedule of constitution of India. In order to make the processing faster, core electronics techniques like clock dedicated route, directed routing, area group compression, mapping, finite state machine, controlling skew, jitter and delay for high performance Unicode reader design are used. In order to make them energy efficient, core electronics techniques like clock gating, capacitance scaling, voltage scaling, thermal scaling, IO standard, impedance matching, mobile DDR I/O standard, HSTL I/O Standard, DCI, SSTL and LVCMOS for energy efficient Unicode reader design are being used.



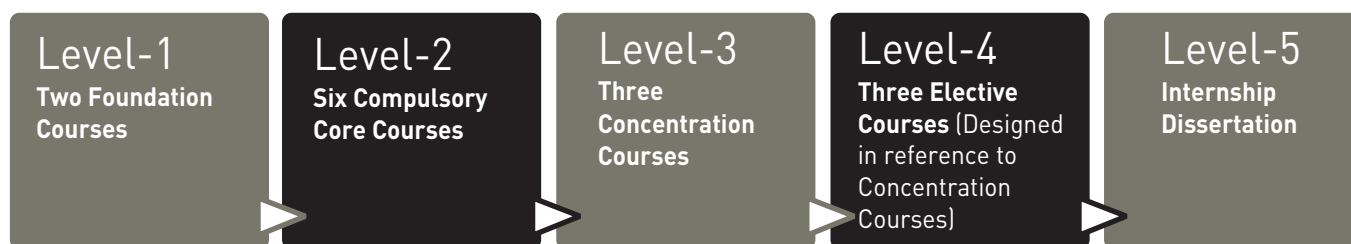
OVERVIEW OF PROJECTS BY OUR ME STUDENTS

Our Master students work closely with the researchers in CURIN to embark their journey on their research careers, which they have so passionately chosen. We have established strong collaborations with leading research labs globally, so as to bring state-of-art tools and technologies for our graduate students to work with.

Some examples of funded projects where our graduate students work to build their Masters thesis are:

- Four Masters students are building a communication platform for differently abled persons to overcome the huddlers they face in day-to-day life. Speech to text and text to sign language transcribers are under development for such auditory impaired persons. They are working to enhance the accuracy of speech recognition tools by applying deep learning algorithms in it.
- Two Master students are working on Industry sponsored project to find out retinal blood vessel parameters from fundus images giving better insight into Retinal images and linking them to pre-diagnostic stages. One of the Master students is working on project for automatic detection and quantification of cancerous cells in Brain MRIs.
- One of the students is developing a data processing device (DPD) for energy efficient data center. It will reduce power dissipation of DPD and will be integrated in data center to reduce power.
- Two students are working in collaboration with NGOs (those running special school for deaf and dumb children) to build software where these differently –abled kids can learn sign language and develop new signs for their own use.
- Three students are working on industry oriented research projects to support the dimensions of sustainability - human, social, economic, environmental, and technical - within different phases of the software lifecycle, with a focus on requirements engineering (RE), quality assurance (QA) and to provide solutions for effective cloud resource management
- Two students are working on patented research project to build a portable and smart intensive care unit that comprises a Remote Access Diagnostic Unit which enables vital/physical parameters of patients to be transmitted wirelessly to a hardware device e.g. smart-phone, enabling the same to be accessed from a remote location .
- Two students are working on Big Data technology using Hadoop Base station for surveillance of sensitive and crowded areas. The system is designed to capture live audio/video and transmit it in real-time to HADOOP base station where audio/video analysis takes place.
- One student is developing microwave somnoplasty based treatment for snoring and other sleep apnea disorders with leading ENT clinicians. Oral substrate integrated applicator arrays are being designed for scar creation nearby uvula. The scar will enable dumping the vibration of uvula hence reducing the snoring, which proves to be fatal during sleep in night. The device can stick on palate inside the mouth.
- Two students are studying magnetic and electrical properties of pure and doped barium Nanohexaferrites. The study will help applying the ferrites in medical, diagnosis and electrical transformers. The study involves investigation of electrical, magnetic, chemical, and morphological characterization for nanohexaferrites.
- Two Master Student are working on patented research project named as eDeweeder. The working of this autonomous device is based on microwave technology and uses ultraviolet rays (UV rays) to kill unwanted weeds.
- One Masters Students is investigating on various selection parameters of materials for electromagnetis discharges machining variables for best surface finish quality.

Academic Framework of RIFP - ME



Courses in the Master of Engineering programs are designed to give the learners breadth for teaching orientation and depth for research orientation.

We offer two foundation courses, six compulsory core courses, three concentration courses and three elective courses during our Master of Engineering programs.

The foundation courses are intended to provide students with foundation knowledge for rest of the program. The six compulsory core courses prepare students with the required core competency for the Masters students to dwell upon their chosen stream. Concentration courses are designed to let the student deep dive in the chosen specialization area, while the elective courses give the finishing touches to his specialization area. Both Concentration and Elective courses are driven and motivated by the research projects at CURIN.

The courses in the RIFP – ME program are taught in blended learning mode. All combinations of Flipped classrooms, On-line classes and Face-to-face classes, Project based and Experiential classes are organized best suiting to a particular course and to give an exposure to various learning styles and modes to the students.

Finally the dissertation makes the students achieve their allotted research objectives thus leading to Masters degree.

The students are taught courses during winter and summer breaks and are assigned work as Research Assistants with CURIN (Chitkara University Research and Innovation Network) / Teaching Assistants with respective engineering schools during the regular semesters.

Thus, during August – November and during February - May every year, the RIFP – M.E. students assist senior teachers in BE classes / Work on an assigned Research Project.

During December - January and June – July, the RIFP – ME students are taught their RIFP – ME courses in blended learning modes.

Duration

The duration of the program varies from 30 – 36 months.

Option to take direct entry into PhD program:

After two years of successful coursework, the ME students are given option to take direct admission into Regular PhD program. The interested students take admission test for PhD program and successful candidates are given admission. Rest of them continue to work on their dissertation to complete their ME program.

Program Structure of RIFP - ME

The unique program structure offers a variety of roles and exposure to enrolled students. The student will be provided with firsthand experience in classroom teaching as Teaching Assistants / research projects as Research Assistants and would be taught courses by variety of Learning designs. Courses are offered in any of the modes described above. Learning Management System - Google Classroom is used extensively to keep track of the course work. Research Track Courses and Research projects are offered to give the students the required depth in their chosen area of interest.

Academic Year I

August	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN
September	
October	
November	
December	Study 3 Theory Courses And Practice Lab work
January	
February	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN
March	
April	
May	
June	Study 3 Theory Courses And Practice Lab work
July	

Academic Year II

August	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN
September	
October	
November	
December	Study 3 Theory Courses And Practice Lab work
January	
February	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN
March	
April	
May	
June	Study 3 Theory Courses And Practice Lab work
July	

Academic Year III

August	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN Work on Pre-Thesis
September	
October	
December	Work on Thesis
January	
February	Work as Teaching Assistant with School of Engineering OR Work as Research assistant with CURIN Work on Thesis
March	
April	
May	
June	Study 3 Theory Courses And Practice Lab work

Courses offered:

Electronics & Communication Engineering	Computer Science & Engineering	Construction Technology & Management	Mechanical Engineering
Mixed signal circuit design	Algorithm and Complexity	Construction and Contract Management	Advance Engineering Mathematics
Digital image processing	Advanced Computer Architecture	Project Management Systems and Techniques	Advance Thermal Engineering
Mixed signal circuit design Lab	Mobile Computing	Management of Quality and Safety in construction	Product Design and Development
CAD for Digital VLSI Design	Algorithm and Complexity Lab	Construction Costing and Financial Management	Finite Element Method (FEM)
Digital Image Processing Lab	Advanced Databases	Computation Laboratory for Construction Management	Advance Heat and Mass Transfer
Fundamental Programming	Software Testing and Quality Management	Construction and Environment	Advance Power Plant Engineering
Logic Synthesis	AI and Expert Systems	Quantitative Methods in Construction Management	Advance Fluid Mechanics
Advanced Wireless Networks	Software Testing- Lab	Advanced Construction Technology	Modelling and Simulation
Smart Antennas	Advanced Operating System	Site Organization and Management	Work Engineering and Ergonomics
WDM Optical Networks	Advanced Computer	Principles and Practices in Management	Computational Fluid Dynamics (CFD)
Advanced Digital Communication	Advanced Computer Networks Lab	Construction Engineering Practices	Design of Gas Turbines
Pattern Recognition and Analysis	Cloud Computing	Software use in Construction Management	Research Methodology
Mobile Computing	Data warehousing & Mining	Pre Thesis Work Thesis (On site training for 6 months)	Renewable Energy Systems

Research projects are based on (but not limited to):

Electronics & Communication	Computer Science & Engineering Engineering	Construction Technology & Management	Mechanical Engineering
Computer Vision design	Virtual Private Network & Implementation	Precautionary Construction Management for Sustainability	Machining and Manufacturing
Embedded Systems Design	Speech Signal Processing	Applicability of Green Engineering Solution	Machine design and CAD / CAM
RF Design	Digital Image Processing	Green Technology application in construction	Rotodynamic Machines and Non-Traditional Machining
Adaptive Signal Processing Biomedical Signal Processing	Data Mining & Warehousing	Green Tech Knowledge of Construction Workforce and Empowerment of knowledge in Construction Project	Mechanical Vibrations and design
Mixed Signal Designs	Advanced Software Engineering Concepts	Theory of Constraints in Construction Projects	Production and surface Engineering
Nano Technology: System & Materials	Advanced Databases & Knowledge Management Systems	Contradiction analysis of Construction Innovation	Automation and Robotics
VLSI DESIGN	Data mining & Warehousing		Thermal Engineering
Fuzzy Systems Design	Big Data and business Intelligence		Industrial Engineering

Dissertation

After completion of coursework, the candidates are required to submit a dissertation based on the research project they have worked. The candidate has to defend his/ her research findings before expert committee and to appear for final viva. On successful defense of research findings and acceptance of dissertation, the candidate will be conferred with Masters Degree in the concerned engineering discipline.

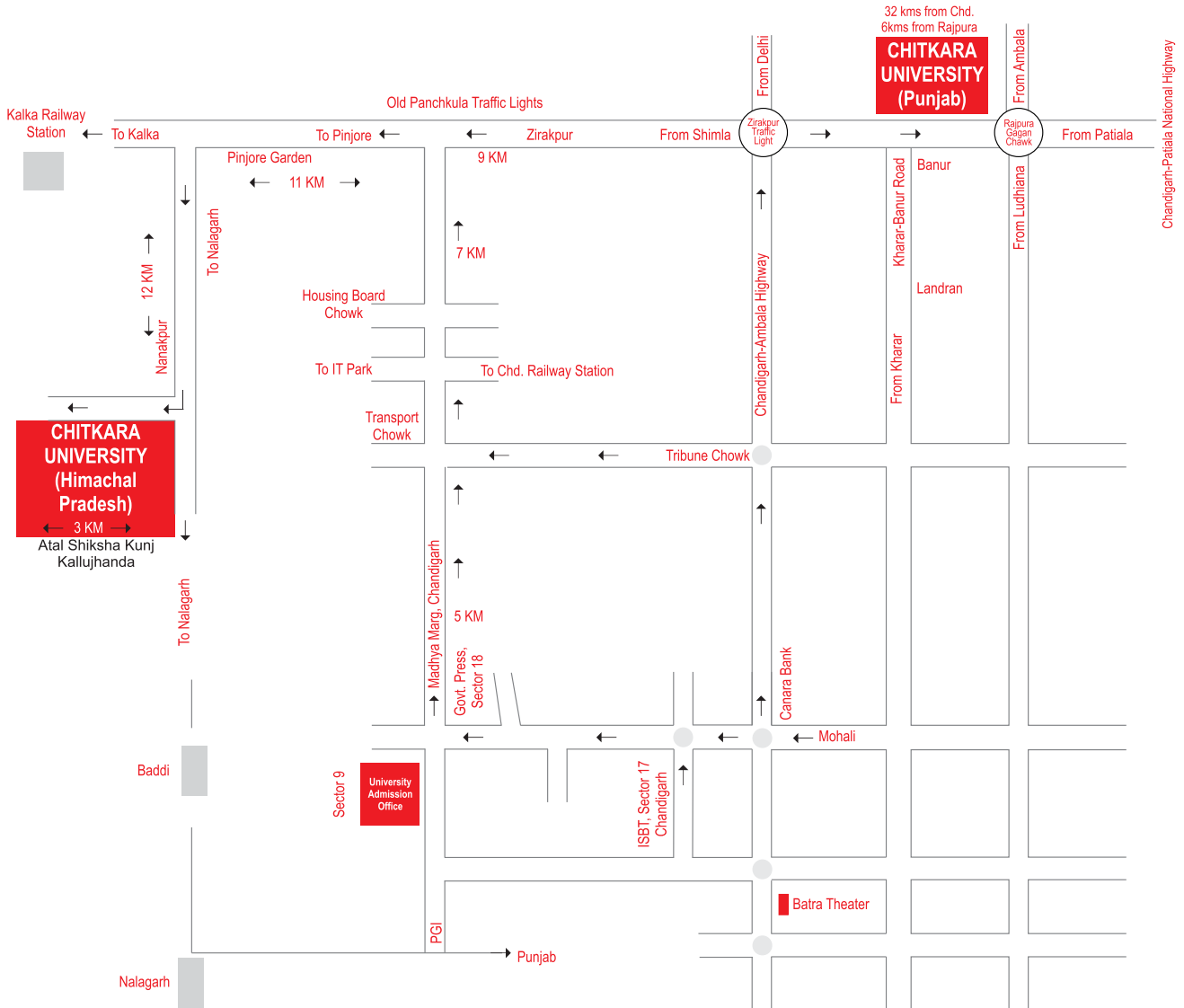
Admission Criteria Admission Eligibility

RIFP M.E. [Computer Science & Engineering] Candidate having BE/BTech[Electronics/Electrical/CSE/IT] or MSc[CS]/MSc[IT] or MCA with 60% marks or CGPA of 6 on a scale of 10.

RIFP M.E. [Electronics & Communication Engineering] Candidate having BE/BTech[Electronics /Electrical /CSE/IT] or MSc[CS]/MSc[IT]/MSc (Electronics) or MCA with 60% marks or CGPA of 6 on a scale of 10.

RIFP M.E. [Construction Technology & Management] Candidate should have passed B.E. / B.Tech / AMIE in Civil Engineering with minimum C.G.P.A of 5 / 50% marks from the Government / UGC recognized University.

RIFP M.E. [Mechanical Engineering] Candidate should have passed B.E. / B.Tech / AMIE in Mechanical Engineering with minimum C.G.P.A of 6 / 60% marks on a scale of 10.



Chandigarh is conveniently linked to the rest of the country by air, road and rail network.

How to Reach Chandigarh by Air

Chandigarh has an airport just 11kms away from the City Centre. Major airlines connect the city with other major cities like Mumbai & Delhi.

How to Reach Chandigarh by Road

The city boast of an excellent road-network. It is also conveniently located within motor-able distance from a number of major cities of North India. National Highways 21 and 22 run through the city. Near perfect road condition and breathtaking view on either side offer a pleasant drive. It is approx. 250 kms North of Delhi & it takes almost 5 hrs to cover the journey.

How to Reach Chandigarh by Rail

The rail network serves the city conveniently. Chandigarh Railway Station is about 8kms from the City Centre in Sector 17. Important trains like the Shatabdi Express and the Himalayan Queen provide two train connections every day between Chandigarh and Delhi.

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