Academic Year 2019

4 Year Bachelor of Engineering (B.E)
Computer Science | Electronics & Computer Engineering | Civil | Fire & Safety
Electronics & Communication | Electrical | Mechanical | Mechatronics
BCA | MCA

We're CHITKARA UNIVERSITY

You're talented, ambitious and career focussed. You're in the right place.

We're Gold

We're gold when it comes to delivering consistent outstanding teaching, and positive learning outcomes for our students. We encourage an open learning environment, where students can extend their skills and knowledge by exploring their own potential, and a cross-disciplinary learning.

We've Got Expertise

At Chitkara University, we constantly aspire to provide a healthy, safe and supportive learning environment for our students. Your degree will be guided by specialists in their field, who are purely driven by passion for their subject and a quest for excellence. Your success is our success and each one of you is treated as a unique individual at our institution.

We're Engaging

You won't be lost in the crowd with us. Controlling class size to increase student achievement is an approach that has been long followed at Chitkara University. Quality has always taken a precedence over quantity and smaller class sizes mean we get to know you as an individuals, thus allowing us to offer better engagement in tutorials, and more opportunities for your voice to be heard.

We'll Find You A Career

At Chitkara University, you can literally take your pick of degrees from a variety of applied, list of programs. With strong industry collaborations and associations, we offer a real life learning that makes you more employable and relevant to the job vacancies. Our career centre are student placement cell ensures that you get meaningful and quality placements post your education.

We're Global

With more than hundred international partnerships that span across study abroad programs, student exchange and course articulations, you are prepared to explore your horizons and broad avenues for global experience. We will prepare you for your global stint and hand-hold you through the entire process.

We're In An Oasis

Chitkara University campuses located close to the vibrant, thriving and prosperous Chandigarh combine a fantastic quality of life, cosmopolitan outlook, and excellent employment prospects. The city is one of the most planned and contemporary cities of modern India, and has been ranked among the top 10 hubs for tech jobs in India.


Come and experience an applied education complimented by an infrastructure, that is way ahead of its time

CHITKARA UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY (CUIET)

Chitkara University (Punjab)

With the establishment of Chitkara University, Chitkara University Institute of Engineering and Technology (CUIET) became one of its leading institutions in Engineering Education. Our expert faculty, at the institute, will harness your growth mindset and help you develop a proactive attitude to form the foundation of your future career.

For the academic year 2019, we will be offering the following programs:

4-Year Bachelor of Engineering (B.E.) Programs

After the 4th semester, student can pursue further specialisations based on their chosen field.

- **Computer Science Engineering**
  Specialisations:
  Data Analytics | Cyber Security with Quick Heal Academy | Cloud Computing & Virtualisation Technology | DevOps (Development & Operations) | Full Stack Development | Mobile Computing | Game Design and Augmented Reality | UI/UX Design with ImaginXP
- **Electronics & Computer Engineering**
- **Electronics & Communication Engineering**
  Specialisations :
  Embedded Systems and IOT | VLSI Design
- **Electrical Engineering**
  Specialisations:
  Hybrid & Electric Vehicle Technology | Industrial Automation
- **Civil Engineering**
  Specialisations:
  Public Health Engineering | Construction Engineering Management | Structural Engineering
- **Fire & Safety Engineering**
- **Mechanical Engineering**
  Specialisations:
  Automotive Engineering with an introduction to Hybrid & Electric Vehicles
- **Mechatronics Engineering**
- **3-Year Bachelor of Computer Applications (BCA)**
- **5-Year Integrated BCA-MCA**
- **2-Year Master of Computer Applications (MCA) Lateral**
- **Master of Engineering (M.E.) Fellowship Programs in CSE | ECE | ME**

CHITKARA SCHOOL OF ENGINEERING & TECHNOLOGY (CSET)

Chitkara University (Himachal Pradesh)

Established in the year 2008, Chitkara School of Engineering & Technology (CSET) at Chitkara University (Himachal Pradesh), has also become one of the premier Engineering institutes of North India. We aspire to provide our students with industry-standard facilities and "real world" work experience by being at the forefront of building strong collaborations with companies like ARM, Cadence, Microsoft, to name but a few.

For the academic year 2019, we will be offering the following programs:

4-Year Bachelor of Engineering (B.E.) Programs
After the 4th semester, students can pursue further specialisations based on their chosen field.

- **Computer Science Engineering**
  Specialisations:
  - Data Analytics
  - Cyber Security with Quick Heal Academy
  - Cloud Computing & Virtualisation Technology
  - DevOps (Development & Operations)
  - Full Stack Development
  - Mobile Computing
  - Game Design and Augmented Reality
  - UI/UX Design with ImaginXP
- **Electronics & Computer Engineering**
- **Electronics & Communication Engineering**
  Specialisations:
  - Embedded Systems and IOT
  - VLSI Design
- **Civil Engineering**
  Specialisations:
  - Public Health Engineering
  - Construction Engineering Management
  - Structural Engineering
- **3-Year Bachelor of Computer Applications (BCA)**
- **5-Year Integrated BCA-MCA**
- **Master of Engineering (M.E.) Fellowship Programs in Civil Engineering**


CHITKARA UNIVERSITY
Explore Your Potential
COMPUTER CENTRE

TOP 20 RANKING

Chitkara University has been consistently ranked among the Top 20 Private Universities of the country.

LEARN FROM THE BEST

You'll study under some of the brightest and most inspiring academics, lecturers and researchers in the world.

TRAVEL THE WORLD

At Chitkara University, we offer over 100 exchange destinations to consider.

LEADING INNOVATION

Chitkara Innovation Incubator helps turn students' business ideas into reality. Student ventures with scalable and commercial potential are given access to state-of-the-art technology, collaborative office space to develop market testable products and services.

CAMPUS PLACEMENTS

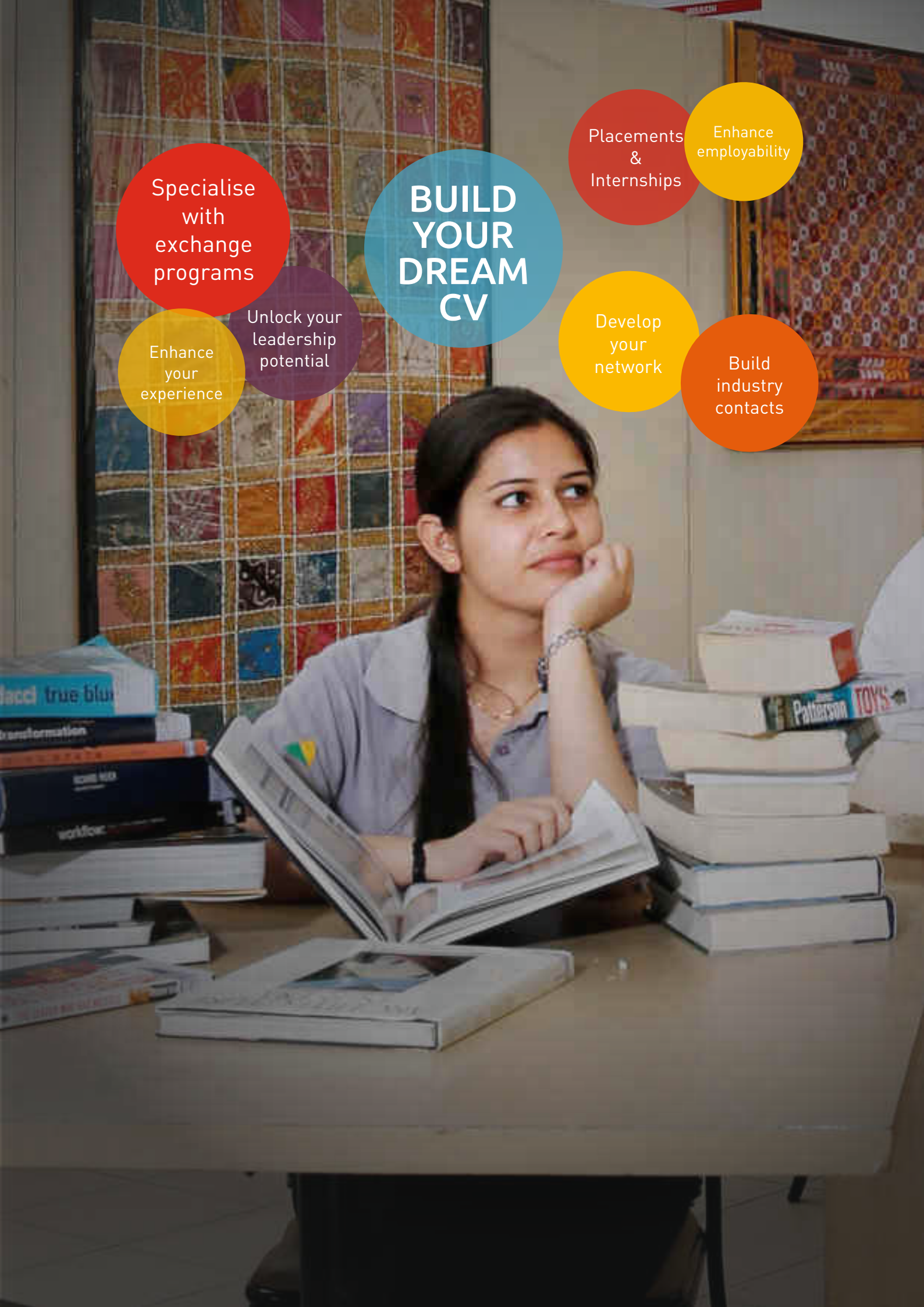
Chitkara University has established an unassailable reputation for strong on-campus recruitments. Our students have gained employment in diverse professional roles and areas across the globe. From managing hotels to discovering new drugs to helping patients in hospital to analysing the stock market, your degree can lead to rewarding career paths.

Chitkara Engineering Education

You're curious about the way things work – from gadgets to engines, motorways and skyscrapers – and creating, inventing, innovating, and taking on challenges are your driving forces, then Chitkara Engineering Programs can show you the way to ensure a bright future.

Chitkara Engineering Programs were initiated in the year 2002, with the sole focus to prepare students for careers as Engineers in a rapidly changing, technologically driven environment. **Within a decade, our Engineering Programs have emerged as among the top 50 of the country, giving testimony to our strong academic heritage, innovative teaching methodology and proactive industry collaborations.**

We, at Chitkara University, are dedicated to give you an exceptional learning experience with expert faculty, state-of-the-art equipment and cutting edge technology. The Engineering Programs at the University are taught through a combination of lectures, tutorials, seminars, workshops, laboratory classes, presentations and individual teaching sessions. Visiting faculty and critics of international repute regularly contribute to the wealth of expertise in the department. As a result, our graduates are highly sought after in a range of Engineering careers, and have successfully entered doors to employment in diverse sectors like finance, education and manufacturing.


BUILD YOUR DREAM CV
Specialise with exchange programs
Unlock your leadership potential
Enhance your experience
Placements & Internships
Enhance employability
Develop your network
Build industry contacts

Education Ahead Of Its Time

As a part of the top-50 Engineering Schools of the country, it's a given that you will be challenged technically. Through our "hands-on" curriculum, students get to unleash their creativity to conceptualise, design and construct their vision right here at the campus. Be it putting together an all-terrain vehicle to building steel bridges, producing animations/ video games or harnessing the power of the sun to race cars, our Engineers don't just learn theory – they expand upon it and apply it.

EXPLORE & INNOVATE

At Chitkara University, we encourage young minds to unleash their creativity and innovate. We prioritise "hands-on" learning where we teach students how to convert ideas into reality, not just by enhancing their technical skills but also by encouraging effective collaboration, problem solving and critical thinking to deliver innovative solutions to real problems and communicate clearly with all the stakeholders and peers. Our students have won many accolades while competing at national and international level design projects, including Solar Car, Mini-Baja, Steel Bridge and Gaming design.

COMMUNICATION

At Chitkara University, we know that budding Engineers need to be effective communicators and strong persuaders. Keeping this in mind, our graduates are equipped with a toolkit of communication skills to articulate ideas, contribute successfully in teams, and work collaboratively with others. These are essential to being confident and effective Engineering leaders.

INTELLECTUAL CURIOSITY

At Chitkara University, you can expect more than a rigid course schedule and books, because we recognise that students are always better at learning information that they are curious about. Keeping this in mind, our expert faculty encourage asking the right questions so that students are naturally motivated to research, learn, and explore. In fact, a majority of our students participate in research during their undergraduate years, and grab opportunities to work in real-time environments. Deserving students are even provided financial grants for their research projects.

ACTIVE LEARNING

At Chitkara University, the focus in Engineering education is to move from an emphasis on theory to a balance between concrete experiences and analysis. Hands-on activities, interactive multimedia and improved team dynamics for enhancing Engineering curricula are regularly incorporated by our faculty to cement the understanding of different concepts in a subject and ensure that classes are never dull.

STRONG INDUSTRY COLLABORATION

Chitkara University engages in state-of-the-art research in almost all fields of Engineering to make its graduates "Industry Ready". The focus is to generate new ideas, create innovative solutions and apply basic principles with an emphasis on using all this knowledge in developing industry-university Engineering centres. In the process, we work closely with our industry partners with the objective of adding value to their brand, and with the larger goal of bringing in novel solutions for the society at large. At Chitkara University, we have collaborations with some world-class companies to include faculty development programs, soft-skills training workshops, industrial visits, technical competitions, live projects and guest lectures. Notably, 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.

Google

SAP

Texas Instruments

Microsoft

NVIDIA

Cisco Systems Networking Academy

Quick Heal Academy
Creating a Safer Digital World

ARM

Infosys

NXP

RASCO

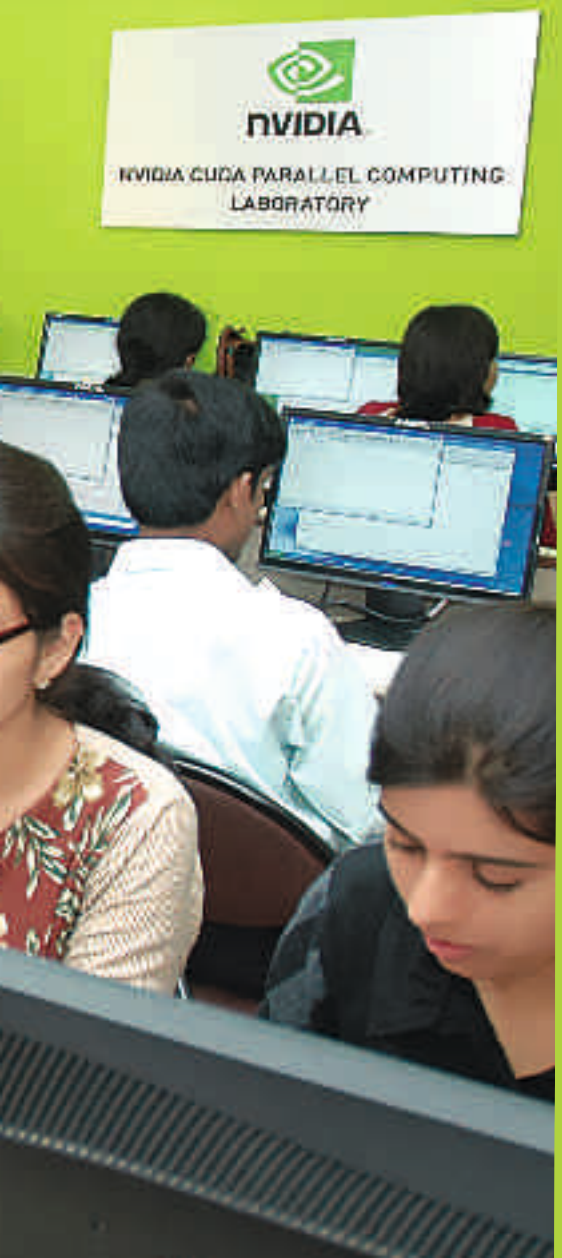
Pega

virtusa
Accelerating Business Outcomes

IMAGINxP
Design Thinking and UX Design

For our Engineering programs, we realise 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" students who are well rounded and quick learners.

Marquee companies such as nVidia, ARM, cadence, NXP Semiconductors 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 a part of the SAP University Alliance

Google Student Ambassador Program for students to act as liaison between Google and the University

Apple funded labs for making students proficient in IOS mobile applications

Microsoft Innovation Centre for expert hands-on support on Microsoft technology innovation, research, and software solutions

4-Year B.E. specialisation in Cyber Security & Forensics at Chitkara University in collaboration with Quick Heal Academy

"Teaching CUDA Centre" status granted to Chitkara University by nVIDIA, a leading company in parallel computing space

State-of-the-art equipment provided by ARM, Cadence and NXP Semiconductors for hands-on classroom training

Joint B.E. Mechanical Engineering Degree Programme by Rasco Automotive for 3D scanning and reverse engineering technologies

Blue chip companies like Virtusa, QuickHeal & Pega have established centres of excellence at our campus.

ImaginXP has established centres of excellence for User Experience Design at our campus.

Strong linkages with industry leaders CISCO, Ericsson & National Instruments to develop and deploy industry-relevant curricula on various technologies for Engineering

Technical and software labs for design, manufacturing and documentation by Tata Technologies and Dassault Systemes, to cater to the rising demands of designers, analysts in the Automotive industry

STUDENT LIFE

Our flexible programs, world-class facilities and award-winning support services combine to ensure that your university experience is exceptional and unique. With student clubs, research projects, design competitions and more, you will have no trouble finding a stage to pursue your passions. Students can participate in research projects of national character and work with blue chip companies such as Google, Texas Instruments & Hewlett Packard (HP) as well as state governments projects.

More than 20 active clubs and organisations at the campuses, based on a wide range of academic, cultural and recreational areas of interest, aim to provide you with countless opportunities to get engaged, and feel enriched. Join, lead or start your own student experience at Chitkara University, and you can surely find a way to express yourself, refine your experience, explore interests, and make friendships that will last a lifetime!

STUDENT CHAPTERS ON CAMPUS

- Institute of Electrical Electronics Engineers
- Society of Automotive Engineers
- Association for Computer Machinery
- American Society of Mechanical Engineers
- Institute of Electronics and Telecommunication Engineers
- Computer Society of India
- The Indian Society for Technical Education
- Formula Student
- The Institution of Engineers


HITKARA UNIVERSITY
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CAMPUS IS

ALIVE 24-7

CAREERS AND YOUR FUTURE

Getting a respectable and rewarding career after graduation is one of the main reasons for going to a University. At Chitkara University, we plan your education in a way that your future career and skills development is embedded within our degree programs, through modules on employability, and opportunities to spend time in industry. In order to get you ready for an increasingly competitive job market or pursue further study or even your aspiration to study overseas, we offer an exceptional range of possibilities to gain practical work skills, experience and expertise that the future employers will seek.

We are the university of choice for many career-minded students and employers from all sectors; locally, nationally and internationally. Employers visit our campus to recruit graduates who can show evidence of team work, leadership or who have spent time travelling and experienced challenging situations and cultures. Everything you do here at the University – be it socially, academically or during internships, will make you more employable. We will help you identify, learn and leverage your learning skills to prospective employers.

This year, 18th batch of Engineering graduates from Chitkara University, Punjab; 10th batch of Engineering graduates from Chitkara University, Himachal Pradesh, appeared for the campus recruitment process this year.

Major highlights of the campus recruitment for the batch graduated in the year 2018:

179 companies came on-campus for hiring Chitkara Engineering students

Out of batch of 1050 students around 350 got "Dream Job Offers" from marquee companies, including Amazon, HP Labs, Verizon, FICO, Evalueserve, MakeMyTrip, Reliance Industries, HP, Quick Heal, OYO Rooms, Panasonic, Quicker

Top on-campus recruiters included, Infosys, Capgemini, Cybage, ITC Infotech, Virtusa, Wipro, Hitachi, Newgen, Unisys, Amdocs, Eclerx, Credforce Asia

For Mechanical Engineering students some of the major companies that visited our campus included, Reliance, Mahindra & Mahindra, Honda, Eaton, SML ISUZU, Yamaha, L&T, Escorts, Jindal Saw, Mondelez, Godrej & Boyce, Coca Cola, Piaggio, Hyundai Infrastructures, JCB India, Ranault Nissan

For Civil Engineering students some of the major companies that visited our campus included, L&T Construction, Sobha Developers, 3 C, Shapoorji Pallonji, Sterling & Wilson, Cinda Construction, Lafarge, Afcons, Raheja Construction, DLF, JSW Steel, Mahindra EPC


Coliseum
THEATRE

SOME OF THE MAJOR COMPANIES THAT VISITED OUR CAMPUS THIS YEAR AND HIRED OUR ENGINEERING GRADUATES

IT INDUSTRY


DELL
ARICENT
fiserv.
Panasonic
CompuGain
Cybage
Delivering Value Scientifically
BYJU'S
HLS
ASIA LIMITED
optymyze
aayuja
4S FOURSOFT
Internet Solutions for Logistics
xansa
RESOURCING SOLUTIONS
Hexaware
TECHNOLOGIES
YOUR SUCCESS IS OUR FOCUS
clicklabs
American
Megatrends
WINSHUTTLE
JKT
A Global IT Solutions, Consulting
and Services Company
uTrade
Enabling Smarter Trading
UNISYS
TTCONSULTANTS
jade
GLOBAL
INTERGLOBE
ZenSar
TECHNOLOGIES
Your Transformation Partner
FLEXTRONICS
tbs
edifecs
TRIGENT
OVERCOMING LIMITS
KEWILL
Infotech
SSS
vodafone
InfrasoftTech
Birla soft®
steria
NIIT
Hitachi Consulting
ZYCUS
TOSHIBA
Leading Innovation
VIDEOCON
tavisca
SPAN
PAXCEL
SafeNet
MICROLAND
NEC
Capgemini
eClerx
nagarro
AGC
AON
BARCLAYS
zscaler
policybazaar
PayU
JUSPAY
Nityo
Infotech
KEYSIGHT
TECHNOLOGIES
MAQ
Software
BeeHyv
cleartrip
redhat
TIVO

SOME OF THE MAJOR COMPANIES THAT VISITED OUR CAMPUS THIS YEAR AND HIRED OUR ENGINEERING GRADUATES

HEAVY ENGINEERING /AUTOMOBILE / CONSTRUCTION

Mahindra | L&T Construction | ESCORTS | DENSO | u-shin

MMD | VE COMMERCIAL VEHICLES (A VOLVO GROUP AND EICHER MOTORS JOINT VENTURE) | apollo | KEC (KEC INTERNATIONAL LIMITED) | [redacted]

JCB | Godrej | TATA (TATA TECHNOLOGIES) | JSW Steel | ASHOK LEYLAND

Panasonic | Reliance Industries Limited | B/S/H/ | Mondelēz International | HYUNDAI

AIS (Asahi India Glass Ltd.) | Coca-Cola | Hero | LUMINOUS | IR Ingersoll Rand

JKTYRE | SML ISUZU | Kirloskar | Punj Llyod | SONALIKA INTERNATIONAL (ISO 9001:2000 COMPANY)

LG | SKODA | CINDA | THE 3C COMPANY (CREATE I CARE I CONSERVE) | AFCONS

COLLAGE GROUP (people make spaces) | EVEREST (Complete Building Solutions) | STERLING AND WILSON | ERA (Believe in difference) | CUMI

SEMI CONDUCTORS / KPO / CONSULTING

Your Global Journey Starts Here

At Chitkara University we aim to provide every student with an opportunity to gain an international experience. The University takes pride in establishing its international partnerships and participates in programs with several universities around the world, which allow students to spend a part of their study time in another country. These high-quality and flexible study pathways with course articulations with leading colleges and universities of the world prepares you for your success overseas, when you start at Chitkara University. We will handhold you to understand the academic rigour and the expectations around studying an International curricula, including the nuances of staying in a different country. Not only will it enrich your educational experience, it will prepare you for a career in a competitive and global job market. Please explore a list of our partnerships in countries across the globe.

What will the International education and exposure prepare you for?

- Broadens your cultural and social perspective
- Become a citizen of the world
- Enhances your employability
- Boosts your self-confidence, independence and ambition
- Conquer challenges, solve problems and discover new strengths and abilities
- Develops your language and communication skills
- Build up your personal and professional networks

Expand Your Horizons

Studying overseas is an amazing experience and you are likely to form strong bonds with those you share the experience with. Friends make every experience better!

Challenge what you thought you knew about yourself, try many new things for the first time, and really get an understanding of that phrase 'personal development'

USA

- Missouri University of Science & Technology (S&T)
- Portland State University
- Northern Illinois University
- San Diego State University
- Northern Arizona University
- University of Masschusetts Lowell (UML)

CANADA

- Vancouver Island University
- Lakehead University
- University of Prince Edward Island
- British Columbia Institute of Technology (BCIT)
- Georgian College
- Vancouver Film School
- Red River College
- University of Ottawa

START HERE
GO ANYWHERE

UNITED KINGDOM

- University of Birmingham
- Glasgow Caledonian University
- Anglia Ruskin University
- Heriot-Watt University
- University of Nottingham

MALAYSIA

- University of Nottingham
- Heriot-Watt University

AUSTRALIA

- Deakin University
- Federation University
- Murdoch University
- Griffith University
- Macquarie University
- University of New Castle
- Western Sydney University
- Edith Cowan University

RESEARCH @ CHITKARA

The opportunity to do research – from the very start – is one of the hallmarks of Chitkara University Engineering education.

If it's research that interests you, Chitkara University offers an impressive number and range of opportunities for students. Our reputation for cutting-edge research and innovative thinking has been growing for well over a decade. While you read this, our students and faculty are busy working on hundreds of funded research projects – making new discoveries and developing new technologies.

CHITKARA UNIVERSITY RESEARCH & INNOVATION NETWORK (CURIN)

At Chitkara, we're all about knowledge and innovation.

Our expert faculty and students, at the Chitkara University Research and Innovation Network (CURIN), constantly work across disciplines to bring two worlds together - the world of knowledge in universities and the world of innovation in companies and society. Eleven centres of advanced research under CURIN build and sustain the University's competitive advantage to form the locus of research for collaborative groups of investigators pushing the frontiers of knowledge forward. We're a catalyst that helps the world become better place and knowledge to flow more freely.

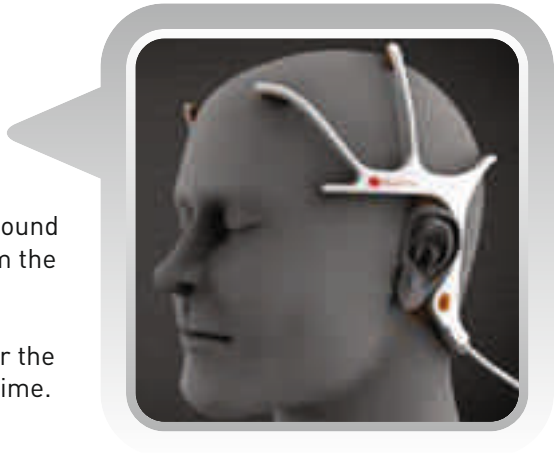
A RESEARCH & PRACTICE LED CULTURE

ELECTRONICALLY CONTROLLED NURSING BED

B.E. students Piyush and Pranay, along with their mentors at CURIN, designed an electronically controlled nursing bed for bedridden patients, allowing them to change their positions periodically, as suggested by doctors. The automated device is built with gesture control features to allow patients to self control change their bed positions, angles and height, for comfort and appropriate blood circulation. Additional features include allowing the patient to control the room ambience, including lighting, temperature control, window blinds, upholstery, etc., without the help of an attendant. The electronically controlled bed also comes with an electronic sanitary trolley to allow patients easy bowl movement without much movement.

REAL TIME COMMUNICATION DEVICE FOR THE SPEECH IMPAIRED

Students at Chitkara along with their mentors at the University, developed a real time communications device for the speech impaired, allowing them to correspond like normal people. The inventors used dry electrode EEG sensors and an electric wave generator with comparator to generate sound signals. The required decibel signals were then extracted from the comparator and amplified to feed a voice synthesizer, which decoded the brain signals into vocals and broadcasted using speakers. The light weight and easy to carry device allowed for the user to easily convert brain signals into audible voice, in real time.



SOLAR LOUNGE

Making Chitkara University proud, Shrey Dhiman, a final year student of Electrical Engineering, won the Bronze medal for his project "Solar Lounge" in All India Design Competition for Engineering Students-2014 (EE). The prestigious competition was conducted by National Design and Research Forum, The Institution of Engineers (India).

WIRELESS COMMUNICATION DEVICE FOR IMPROVED WiFi (WIRELESS FIDELITY) SIGNAL

Students at Chitkara University developed a special wireless communications device for improved Wi-Fi (Wireless Fidelity) signal with high frequency, quick data transfer rate and marginal rate of error. Ensuring excellent signal strength with the help of inbuilt amplifiers, repeaters, multipliers, dividers, omni-directional antennas, the device has the capacity to eliminate the need of two – three Wi-Fi routers. Additionally, the device considerably boosts the data transfer rate from 800Mbps to 3000Mbps.

IMPROVED MECHANISM FOR VALVE ACTUATION IN CAMLESS ENGINE

With perseverance and continuous hard work, students at Chitkara University came up with an improved mechanism for valve actuation in cam-less engine. The young inventors replaced the valve sensors by using a laser light and LDR-based circuit system to come up with an improved version of the original. The mechanism included a disc with a pin hole attached to the crank shaft to track its orientation, and further detects the hole's alignment to the laser beam. The signal was then forwarded to the Electronic Control Unit (ECU) to record its RPM (revolutions per minute) and thus time the valves. The entire system was designed to be fixed outside the engine block, and therefore could be used at low working temperature range and reduced cost.

FOLDING BICYCLE

Chitkara University students, Lavan Jain, Divyanshu Sood and Akshdeep Chahl, developed a simple, low-cost bicycle folding mechanism for bicycles, making them compact and easy to transport. The folding mechanism for the bicycle comprised of a door hinge and crank set (bicycle chain) aligned together. The mechanism works by allowing both the wheel axes to overlap and bring the length of the bicycle to half of its original. We're excited to announce that the Minimum Viable Product of this innovation is ready and all set to see the light of the day.

'INTELLIGENT SOLAR TRACKER WITH A COMPRESSORLESS REFRIGERATOR'

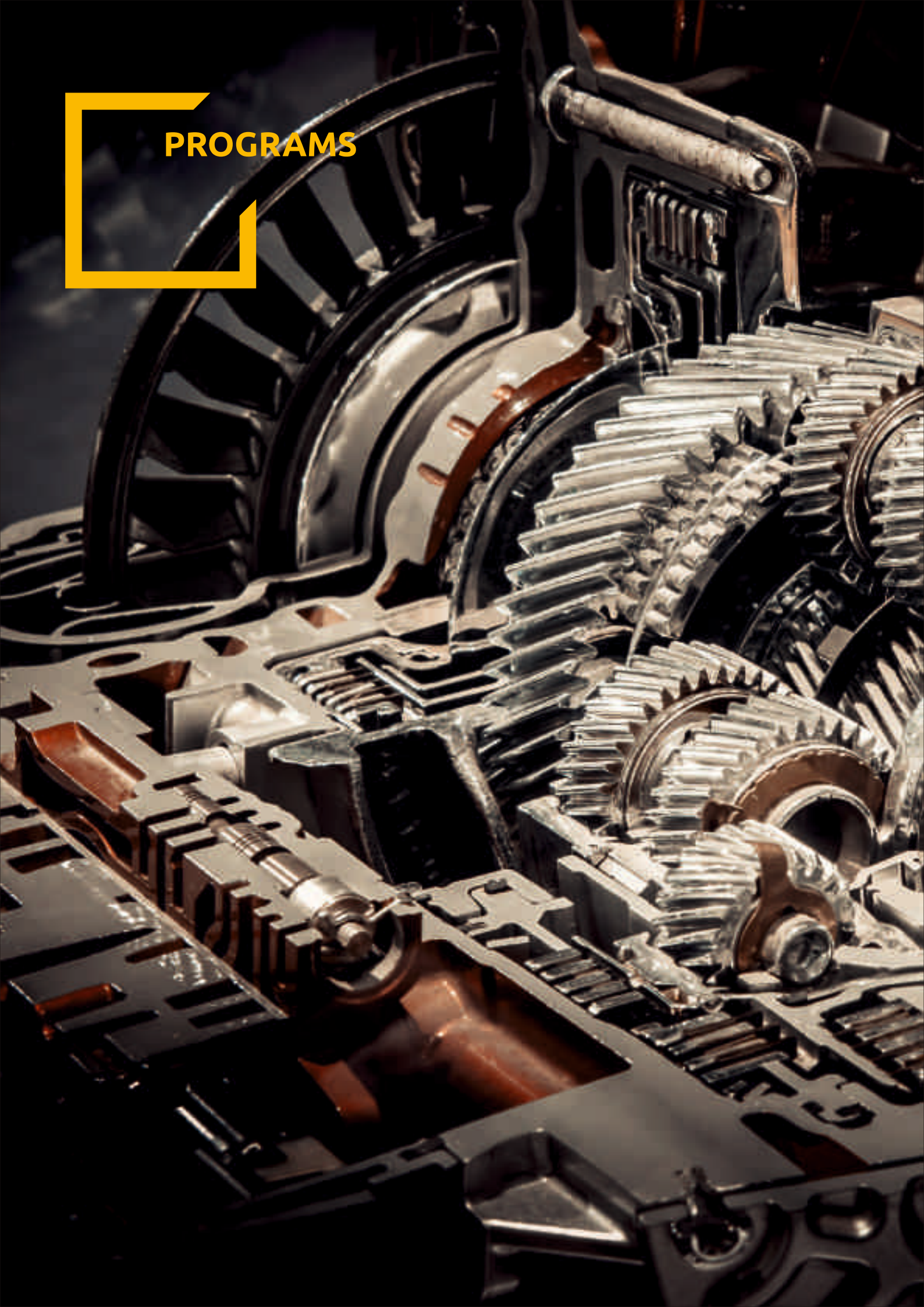
Our student, Nikita Aggarwal along with her team members Bhavika Mittal, Ravneet Kaur, Manmohit Kaleka and Kiran Chauhan, bagged a grant Rs 20,000, from The Institution of Engineers, Kolkata, for their project "Intelligent Solar Tracker with a Compressorless Refrigerator".

LIVE BRAILLE

In 2014, Chitkara Engineering students, Abhinav and team, developed Live Braille, a breakthrough innovation for the visually impaired. The inventors designed a hand glove that allowed the specially-abled to easily manoeuvre and become self-reliant in terms of mobility. Recommended by NASA

- Winner of TiEGER award by TiE
- Awarded by IMechE UK
- Honored by Illinois State University
- Appreciated by various IITs

PROGRAMS



EXPLORE YOUR POTENTIAL

COMPUTER SCIENCE ENGINEERING

SPECIALISATION IN CYBER SECURITY

SPECIALISATION IN DATA ANALYTICS

SPECIALISATION IN CLOUD COMPUTING & VIRTUALISATION TECHNOLOGY

SPECIALISATION IN FULL STACK DEVELOPMENT

SPECIALISATION IN DevOps (DEVELOPMENT OPERATIONS)

SPECIALISATION IN MOBILE COMPUTING

SPECIALISATION IN GAME DESIGN & AUGMENTED REALITY

SPECIALISATION IN UI/UX DESIGN

ELECTRONICS AND COMPUTER ENGINEERING

ELECTRONICS & COMMUNICATION ENGINEERING

SPECIALISATION IN EMBEDDED SYSTEMS & INTERNET OF THINGS (IoT)

SPECIALISATION IN VLSI DESIGNS

ELECTRICAL ENGINEERING

SPECIALISATION IN HYBRID & ELECTRIC VEHICLES

SPECIALISATION IN INDUSTRIAL AUTOMATION

CIVIL ENGINEERING

SPECIALISATION IN PUBLIC HEALTH ENGINEERING

SPECIALISATION IN CONSTRUCTION ENGINEERING MANAGEMENT

SPECIALISATION IN STRUCTURAL ENGINEERING

FIRE & SAFETY ENGINEERING

MECHANICAL ENGINEERING

SPECIALISATION IN AUTOMOTIVE ENGINEERING WITH AN INTRODUCTION TO HYBRID & ELECTRIC VEHICLES

MECHATRONICS ENGINEERING

BACHELOR OF COMPUTER APPLICATIONS

MASTERS OF COMPUTER APPLICATIONS

COMPUTER SCIENCE ENGINEERING

4-Year Bachelor of Engineering

SPECIALISATIONS

After completion of the 4th semester in B.E. (Computer Science Engineering), students will have the opportunity to pursue specialisation in any one of the following fields:

- **Cyber Security in academic collaboration with Quick Heal Academy**
- **Data Analytics**
- **Cloud Computing & Virtualisation Technology**
- **Full Stack Development**
- **DevOps (Development & Operations)**
- **Mobile Computing**
- **Game Design and Augmented Reality**
- **UI/UX Design in collaboration with ImaginXP**

Program Objectives

The fundamental objective of our Computer Science Program is to provide our students with an opportunity to develop a firm foundation in Mathematics, Science and Design methodology of computing systems. Our course curriculum, which covers design, implementation and management of information system, of both hardware and software, has been designed keeping in mind a holistic learning approach, where students are equipped to apply their knowledge and skillset to "real time" scenario in the field of Computer Science Engineering.

Learning Outcomes

- Design software or digital hardware system, component or process to meet targets within realistic constraints, such as economic, environmental, social, political, ethical, health & safety, manufacturability, and sustainability.
- Gain knowledge of probability and statistics, including applications for Computer Science and Engineering.
- Gain knowledge of Mathematics through differential and integral calculus, basic science, Computer Science, and engineering sciences, necessary to analyse and design complex systems containing hardware and software components, as appropriate to Computer Engineering.
- Gain knowledge of advanced Mathematics, including linear algebra, numerical computing methods for Engineering, and discrete Mathematics.
- Gain knowledge of algorithms and data structures
- Apply design and development principles in the construction of software systems of varying complexity.
- Understand concept of programming languages.
- Learn computer organisation and architecture.
- Form theoretical foundations.
- Learn problem analysis and solution design.
- Apply Mathematical foundations, algorithmic principles, and Computer Science theory in modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

Academic Framework

Our curriculum lays intensive focus on:

- Computer Programming & Problem Solving
- Object Oriented Paradigm & Programming
- Digital Logic
- Data Structures & Algorithms
- Computer Architecture & Organisation
- Algorithm Design & Analysis
- Microprocessor & Interfacing
- Operating Systems
- Computer Networks
- Programming Language Translators
- Graphics & Multimedia
- Database Systems
- Software Engineering
- Internet & Web Programming
- Image & Vision Computing
- Software Project Management
- Mobile Computing
- Operations Research
- Information Security
- Cloud Computing
- Wireless Networks
- Concurrent & Distributed Systems
- Data Warehousing & Data Mining

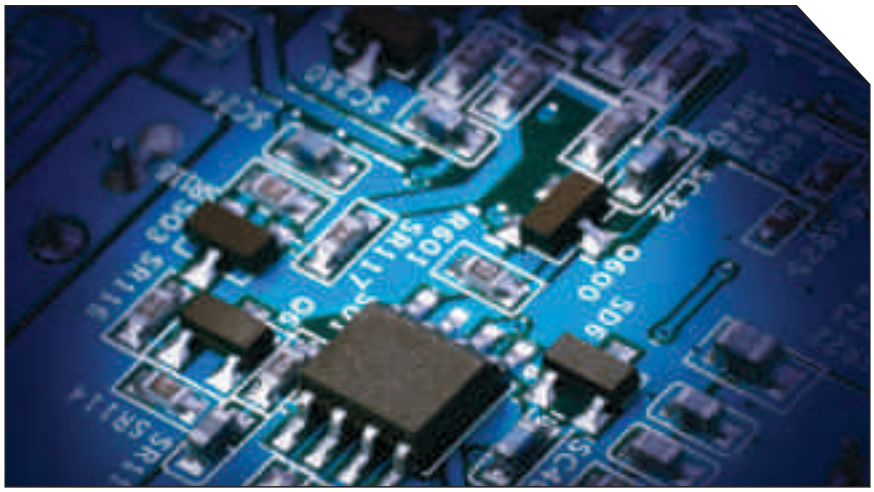
Cutting Edge Labs

Chitkara University boasts of state-of-the-art infrastructure, including domain specific laboratories associated with their technical divisions.

Industry leaders like IBM, Cisco, Google, Microsoft & nVidia have established their laboratories in collaboration with the University at the campus.

Our major laboratories include:

- Theoretical Computer Science and Language Processing
- Open Source Technologies
- Data Technology
- Grid-Cloud Computing
- Software Systems
- Computational Intelligence
- High Performance Computing
- Mobile Computing
- Intel Multi-core Laboratories
- Image Processing



Scope of Employment

Blue chip companies including, Google, Microsoft, Amazon, Infosys, Wipro, HCL Technologies, etc. regularly visit the Chitkara University campuses for recruitment of fresh graduates, offering them excellent remuneration packages. Some roles include:

- Developers and Specialists in high-end services and IT-product companies
- Development Engineers, Technical Leaders and Managers
- Consultants, Solution Developers and Entrepreneurs
- Computing Specialists in Research Labs and Tech Providers
- System/ Network Performance Analysts

SPECIALISATION IN CYBER SECURITY

in academic collaboration with Quick Heal Academy

Introduction

Cyber Security is a branch of Digital Forensic Science pertaining to legal evidence found in the cyber space and digital storage media. In the digital age, the need for cyber experts has grown exponentially as the country is heading towards an internet explosion mostly fuelled by e-commerce, e-banking, e-governance and the social media.

Cyber Security technologies, processes and practices are designed to protect networks, computers, programs and data from damage or unauthorised access.

Computer Forensic Science involves the application of investigation and analysis techniques to gather and preserve evidence from the target computing device in a way that is suitable for presentation in a court of law.

The goal of Computer Forensics is to perform a structured investigation while maintaining a documented chain of evidence to find out exactly what happened on a computing device and who was responsible for it.

What You'll Learn

Cyber Forensics offers you the opportunity to gain a comprehensive and critical understanding of the theory and techniques of contemporary cyber security, and how to apply these in response to "real-world" business problems. The specialist qualification in one of the most essential and in-demand areas of IT, combining-advanced aspects of security, its practical application, and the implications of security within a business. This program will prepare you for an exciting and rewarding career in cyber security, application and software security, and cyber law enforcement, among others.

You will also have the chance to:

- Acquire cutting-edge skills to drive effective cybercrime prevention and protection solutions, as well as conduct investigations into suspected cyberattacks.
- Gain strong skills allowing you to assess security risks and implement the most effective and cutting-edge solutions.
- Tackle the challenges of assessing and managing security risks in the modern workplace.
- Deploy your skills and knowledge in "real-world" scenarios.

- Design plans and strategies for security, dependability, risk and assurance that can be presented to higher management and are built on a solid understanding of technical and business systems and processes.
- Learn the laws and regulations around security risk management, as well as the concepts, methods, approaches and processes used to tackle security risk management.
- Develop a Professional Portfolio of Evidence demonstrating your solution-oriented mindset and practical skills in cyber security.

Quick Heal Academy

Quick Heal Academy is a division of Quick Heal Technologies Limited, with its headquarters in Pune, Maharashtra, India. Quick Heal Technologies Limited, is one of the leading providers of security software products and solutions in India. The company's portfolio includes solutions under the widely recognised brand names 'Quick Heal' and 'SEQRITE' used across various operating systems and devices. Since its incorporation, more than 24.5 million licenses of its products have been installed. Further, Quick Heal has over 8 million active licenses spread across more than 80 countries (as on 30th June 2017).

Careers

With digitalisation moving in the fast lane, it is estimated that a whopping 3 million cyber security professionals will be required in the country to support its fast-growing internet economy. In 2015, Frost & Sullivan had forecast 1.5 million worker shortage by 2020. In the light of recent events and shifting industry dynamics, that forecast has been revised to 1.8 million by 2022, according to the 2017 Global Information Security Workforce Study. While the gap continues to grow, the survey finds that hiring is on the rise and there is a continuous upward trajectory in the sector.

Our Cyber Security engineers shall find excellent placements in research-oriented industries and top ranking global companies, with their careers ranging from:

- Cyber Security Specialist
- Risk Analyst
- Cyber Threats Analyst
- Security Software Developer
- Security Analyst
- Cyber Forensics Solutions Architect/Tech Consultant
- Cyber Forensics Malware Analyst / Examiner/ Engineer
- Security Architect
- Cyber Operations Analyst
- System Administrator
- Security Network Engineer
- Security Consultant
- Cyber Forensics Planning and expansion Specialist

SPECIALISATION IN DATA ANALYTICS

Introduction

The advent of the Internet has expanded the digital technology landscape, manifold. Every action online leaves a digital footprint, thus completely transforming the business world at a rapid speed. There is a massive explosion of data on a daily basis which helps organisations monitor behaviour of their customers, and thus extract valuable insights.

The specialisation in Data Analytics equips students with the skills to draw out intelligent analysis of data, which is a crucial component in numerous business applications and supporting business decisions.

The program is designed to cater to the ever-changing needs and demands of the industry. Data Analysis experts are among the most sought-after professionals in IT sector, with demand for skilled technocrats in that field outpacing other IT jobs by a wide margin.

What You'll Learn

- Data Science principles, tools, and techniques to solve "real world" business problems and suggest suitable solution with relevant findings.
- Recognise issues in everyday business; apply Data Science for better understanding of data-driven management decisions to help get an edge over competition.
- Provide insights into leading analytic practices, design and lead iterative learning and development cycles.
- Produce new and creative analytic solutions, which can become a part of any business core deliverables.
- Get insights on how to improve business results by building data-fuelled products.

Careers

According to NASSCOM, the Data Analytics market will reach $16 billion by the year 2025, growing eightfold from its market worth in 2016. India alone will require over 200,000 data scientists, as per various industry insights.

Types of companies/ organisations looking for data analysts:

- Big IT companies who have an Analytics Practice - Infosys, TCS, Cognizant, Wipro, Oracle
- Analytics KPOs - Genpact, WNS
- In-house Analytics Units of large corporates - Citibank, Dell, HP, Spencers, Target
- Core Analytics firms - Brainmatics, Fractal Analytics, Mu Sigma

SPECIALISATION IN CLOUD COMPUTING & VIRTUALISATION TECHNOLOGY

Introduction

The next wave of computing is in the "Cloud". Many businesses want to get out of the complexity of managing data centres and instead focus on their core competencies. This means that more and more businesses will adopt Cloud Computing as a means to handle their IT requirements, which gives them the freedom from day-to-day management of IT infrastructure.

Cloud Computing and Virtualisation specialisation prepares students to understand the emerging technologies of Cloud Computing and Virtualisation, their principles, modeling, analysis, design, deployment, and industry-oriented applications. All major solution architectures and enabling technologies are covered under this program. Students are prepared for technical careers in developing applications and providing services that run on a distributed network using virtualised resources and enables customers to access computing resources as needed.

What You'll Learn

Cloud Computing is one of the fastest growing technologies that are essential for facilitating Information Technology industry needs for the future.

Virtualisation is the core technology based on which the Cloud-computing paradigm works. The curriculum lays focus on:

- Introduction to Cloud Computing and its techniques, issues, and services that lead to design and development of a simple Cloud service.
- Cloud Computing fundamentals - Cloud Services, its benefits and challenges, usage scenarios and applications.
- Types of Cloud services - Software / Platform / Infrastructure / Database / Monitoring / Communication as a service.
- Collaborating on calendars, schedules and task management – Collaborating on Event Management, Contact Management, Project Management – Word Processing, Databases. Understand collaboration via Web-Based Communication Tools and evaluating Web Mail Services.
- Need for Virtualisation and its types. Interpretation and binary translation.
- Security, standards and applications in Clouds, including Cloud security challenges, software as a Service Security and its common standards.

Careers

All graduating Engineers with specialisation in Cloud Computing & Virtualisation, find excellent placements in research-oriented industries and top ranking global companies. Companies that require specific Cloud Computing skills or development skills are typically already committed to a specific cloud provider, such as Amazon Web Services (AWS), Microsoft Azure or Google Cloud Platform.
All graduating Engineers with the specialisation can find excellent placements in research-oriented industries and top ranking global companies as:

- Cloud Solution Architects
- Cloud System Administrator
- Cloud Security Specialist
- Cloud Application Development/ Maintenance/ Testing
- Migration and Modernisation Specialists
- Cloud Project Management

SPECIALISATION IN FULL STACK DEVELOPMENT

Introduction

As a Full Stack Developer, you are the go-to expert that companies rely on to build, support and maintain their web applications.

At Chitkara University, you will hone your understanding of how the web works, develop complex relational databases used to store applications data, secure and configure your own Linux-based servers, and build complete web applications using Python, HTML, CSS, JavaScript and SQL. Students will work on hands-on exercises, culminating in development of their final portfolio, which will clearly demonstrate key skills mastery to future employers.

With the fast-paced, ever changing nature of technology, at Chitkara University we recognise that developers can no longer afford to ignore any aspect of development, but now must learn the entire process of development from design to the actual deployment. Thus, a comprehensive specialisation on the active and new role for Full Stack Developers.

However, resources to become a Full Stack Developer are limited and only offer sections or just random technologies that you must learn and combine on your own.

What You'll Learn

At Chitkara University, we introduced this well-curated specialisation to get all technologies in perfect sync to help developers transition from a simple developer to a Full Stack Developer.

- Starting from front-end development, the learner will slowly progress to expertise in other aspects of development including back-end, database, debugging, version control and various other essential technologies that are helpful for a developer.
- Full Stack specialisation breaks down the fundamentals of each technology into five separate segments - Frontend, Backend, Database, other Essential Technologies and Debugging/Version Control. Each section includes multiple technologies to help you gain more experience as a developer.
- In addition to theory-based learning, the course also focuses on practical aspects in great detail, aiding you with a hands-on experience.

Careers

Full Stack Developers design complete apps and websites. They work on all facets of development from front-end to back-end, database, debugging and testing. Full Stack developers are more sought after because of their expertise in multiple technologies. They can handle all aspects of development, and it can result in a more seamlessly created product.

Students can choose from various technologies and frameworks to work with:

- Front-end – HTML, HMTL5, CSS3, Twitter Bootstrap, JavaScript, jQuery
- Back-end – Node.js, Meteor.js, Angular 2, PHP, Ruby on Rails
- Database – MySQL, PostgreSQL, MongoDB, CouchDB, Apache Cassandra
- Essential Technologies – Memcached, Redis, Apache Lucene, Apache Solr
- Debugging/Version Control – GIT, Subversion, Task Runners (Grunt, Gulp), Debuggers (Xdebug, Firedebug)

SPECIALISATION IN DevOps (DEVELOPMENT OPERATIONS)

Introduction

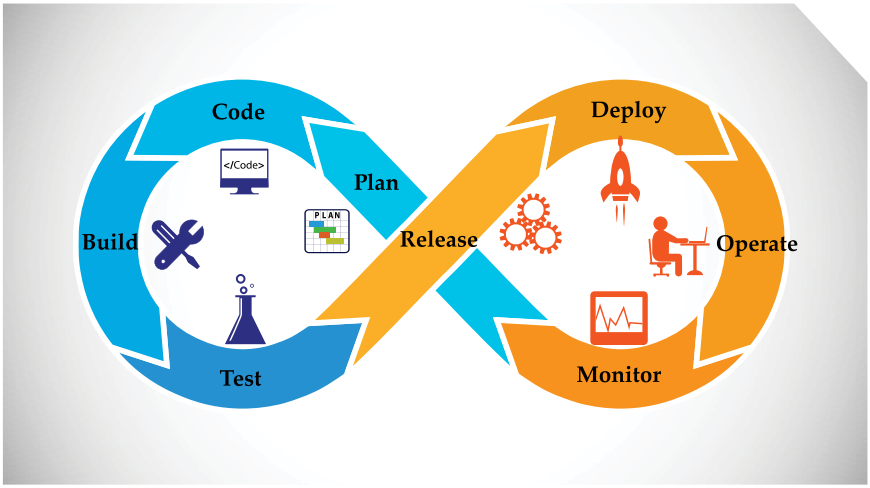
DevOps (development and operations) is an enterprise software development phrase used describe the agile relationship between development and IT operations. The goal of this specialisation is to change and improve the relationship by advocating better communication and collaboration between these two business units. In the enterprise there is a need to break down silos, where business units operate as individual entities within the enterprise where management, processes and information are guarded.

On the software development side-and for those working in IT operations-there needs to be better communication and collaboration to best serve the IT business needs of the organisation. The specialisation in DevOps will help achieve this target.

What You'll Learn

DevOps is not based on stringent methodologies and processes - rather it is based on professional principles that help business units collaborate inside the enterprise and break down traditional silos. You'll learn:

- Guiding principles of DevOps including culture, measurement, automation and sharing.
- New approach to the more traditional application and lifecycle management (ALM) processes.



Careers

DevOps is spreading beyond web companies and enterprises to a more mainstream enterprise audience that includes almost all major verticals. Organisations in the financial services, insurance, telecommunications, retail, manufacturing, transportation, healthcare and the public sector have all begun implementing DevOps processes.

The move by more enterprises to adopt DevOps technology and methodology means continued, growing demand for DevOps practitioners and leaders, hence driving up healthy competition among employers, for higher salaries, from the same pool of talent. IT professionals in DevOps environments tend to get higher salaries partly because they also tend to have more responsibilities that span across development and IT operations.

After specialisation in DevOps, students can explore their career as:

- DevOps Architect
- Software Tester
- Release Manager
- Automation Engineer
- Security Engineer
- Integration Specialist

SPECIALISATION IN MOBILE COMPUTING

Introduction

Mobile phones have emerged as a truly pervasive and affordable Information and Communication Technology (ICT) platform in the last decade. Mobile applications have enabled us to have a world of information at our fingertips, and while it is a constantly evolving field, mobile development is here to stay.

Mobile and Wireless technology has become a fire wave of the future to benefit every aspect of our life including business, personal, education, medical, entertainment as well as global communication. From start-ups to large corporations, all kinds of companies are hiring developers to create engaging mobile apps. At Chitkara University, students will learn the process of building a mobile app from idea to product for various operating systems. Students will also be exposed to valuable industry inputs and insights into the process of creating cutting-edge mobile technology and develop skills to independently analyse, design, develop, deploy, and troubleshoot mobile applications and services.

What You'll Learn

Students will complement their computer science education with an in-depth skillset, including building and programming effective mobile apps, learning the constraints and usability functions of mobile devices, and exploring the current methods to create successful client/ server mobile solutions. Students will cover both theory and practice required to design and build applications for mobile-based services. The program will focus on developing hands-on skills pertaining to the latest and most popular platforms, e.g. IOS, Android, Windows Mobile, etc. They will be trained not only to use existing mobile platforms but also to build new ones. Projects will also be an integral part of the course.
Students will:

- Gain foundational understanding of the current field of mobile computing.
- Get hands-on experience with current mobile platforms, which will provide students a strong insight into what it means to develop mobile application software.
- Evaluate the role that mobile systems play in the ever-changing technology field.
- Compare and contrast various technologies involved in mobile communication, including encryptions and networking.
- Understand mobile concepts to design and develop new and innovative applications for current and future mobile devices.

Careers

With the growing pace of communication and globalisation, sources of data communication have been growing in all the sectors. Nowadays, one of the fast-growing spot in the stream of communication is the Wireless and Mobile Technology. As per TRAI (Telecom Regulatory Authority of India) figures, India became the World's Number 1 Mobile Market in 2013 with more than a billion mobile users. The figures and statistics of the Indian Telecommunication Industry with around 100 mobile phone operators look very lucrative and obviously tremendous job opportunities are available for Engineers and Scientists in this stream.

The career options in the wireless and mobile technologies include:

- Mobile Phone System Engineer
- Mobile Applications Developer
- Mobile Applications Testing Specialist
- IPAD Developer
- Game Developer
- Mobile & Software Platform Architect

SPECIALISATION IN GAME DESIGN & AUGMENTED REALITY

Introduction

We have all played and enjoyed games, but how do people actually design them? How do you describe a game? What are the basic elements? How do designers create an experience for the player? What about prototyping and iterating? This specialisation will help students explore the above questions and more.

Students will be introduced to game design and game design concepts, emphasising the basic tools of game design: paper and digital prototyping, design iteration, and user testing. They will also learn about the challenging, multi-disciplinary subject area of augmented reality (AR), where they will learn the skills required to create VR/AR simulations, games, visualisations and apps.

What You'll Learn

Students will study the creation of digital content and the practical application of VR/AR technologies. You'll learn:

- Research and develop your own VR/AR concepts – creating 2D and 3D digital artwork, as well as computer animation and sound for VR/AR.
- Study the evolving theories and principals of design-led VR/AR. This includes designing for immersive environments, location-based mobile apps and wearable technologies.
- Research and explore theories of user-centred design and user experience.

During the course of specialisation, students will learn that while VR/ AR are separate entities, they often turn up in the same discussions and are referred collectively as "XR", short for "extended reality". Thus, keeping in mind emerging industry trends, Chitkara University also teaches its students the nuances of the XR market to further keep-up with the market trends.

Careers

The combined XR market is soaring. According to Statista, market size was around $6.1 billion in 2016 but is expected to reach $215 billion by 2021. Although companies have spent several years developing and refining this technology, demand for skilled XR professionals is experiencing a major uptick as more technologies make it out of R&D and enter the marketplace. There are many more roles in the XR business in need of people.

- Developers typically collaborate closely with software designers and 3D artists, as well as design Architects and Engineers who plan and create the hardware on which XR software runs.
- System validation Engineers test systems and help resolve technical issues, and circle back with developers to ensure applications get modified accordingly.
- Project managers coordinate and oversee entire development teams, interface with other business units, and work with clients.

SPECIALISATION IN UI/UX DESIGN

in collaboration with ImaginXP

Introduction

UX Design refers to the term "User Experience Design", while UI Design stands for "User Interface Design". Both elements are crucial to a product and work closely together. But despite their professional relationship, the roles themselves are quite different, referring to very different parts of the process and the design discipline. Where UX Design is a more analytical and technical field, UI Design is closer to what we refer to as graphic design, though the responsibilities are somewhat more complex.

At Chitkara University, we offer Computer Science Engineering with specialisation in UI/UX Design program, in collaboration with Industry experts – ImaginXP. This specialisation focuses on teaching students how to design digital products that provide relevant user experiences - understanding the needs of the users, creating a product roadmap based on these user needs and then implementing the principles of UX design to get an easy to use, simple product.

Further, user experience encompasses all aspects of the end-user's interaction with the company, its services, and its products. This implies that regardless of its medium, UX Design encompasses any and all interactions between a potential or active customer and a company. As a scientific process it could be applied to anything, street lamps, cars, Ikea shelving and so on.

What You'll Learn

Chitkara University has the best in-house faculty, accompanied with guest faculty from Industry with expertise in UI/UX domain. This specialisation has been devised and designed by UX Industry, considering the needs of the job market, and offers excellent placement. Our study module also includes rare Industry experience through projects, assignments and internships. Students will be offered:

- Understanding the fundamentals and principles of UI/UX Design.
- Knowledge of tools and process used in UI/UX Design, complemented with a mix of classroom assignments, projects, field work, industry projects, internships and shadow learning.
- Requisite skillset required in "real-life" design problems through visual design tools and introduction to 6D.

- Quizzes, classroom assignments, field work etc. with "real-life" scenarios. Students will be encouraged to come up with efficient solutions.
- Lectures and practical training from Industry experts, including ImaginXP professionals, for relevant Industry knowledge. Hands-on learning with the process of research, testing, development, content, and prototyping to test for quality results.

IMAGINxP

Design Thinking and UX Design

ImaginXP

ImaginXP is a pioneer in the field of UX Design and design thinking education, bringing together industry professionals and academicians to create industry relevant programs. With a total of 95+ faculty and collaboration for faculty exchange from leading universities and institutes in UX design, ImaginXP is bringing quality design thinking and UX design education to India. Their vision is to make India a global design and innovation hub bringing world-class education to Indian students.

Careers

The day-to-day business operations of companies across the globe have changed with advancement of technology and rapid digitalisation. 'Design' of digital product influences business decisions and that's the primary reason of need of UI/UX Designers in industry.

Studies indicate that India is the fastest growing app market in the world. The app usage growth of 131% in India is much higher than the global average and contributes to 19% of the total time an average Indian spends on his or her phone. This, coupled with the heavy outsourcing of web design to India from across the globe, means the career prospects for those with the right education in UI/UX look promising indeed.

Computer Science Engineering students specialising in UI/UX Design, are offered excellent placement, setting them up for success right at the start of their career. Graduates can explore the following roles:

- User Experience - UX Designer, Interaction Designer
- Web / Mobile App Design - App Designer, Web Designer, Social Media Designer, New Media Artist, Web Content Manager
- Visual Design - Type Designer, Graphic Designer, Layout Artist, Photo / Image Editor

ELECTRONICS AND COMPUTER ENGINEERING

4-Year Bachelor of Engineering

Program Objectives

Electronics and Computer Engineering is the integration of Electrical Engineering and Computer Science to develop computer systems. Both these disciplines are closely linked and specifically interwoven to enhance our experience of the world and shape the convenience of our future in terms of solving problems, and developing products & systems. Thus, increasing the accuracy, speed and quality of information sources and technology.

Electronics and Computer Engineering encompasses not just the software aspects of computing but also the hardware. Knowing how the hardware works as well as the software, enables the design of systems that incorporate both counterparts and presents an understanding of the whole process from writing software programs that work on a particular operating system to the communication of this with the hardware.

Combining these two disciplines gives you an excellent grounding in both subject areas and prepares you for a wide range of careers, in both or either fields. This cross-discipline study gives you the advantage of becoming a multi-skilled professional Engineer with a thorough understanding of the concepts and techniques from other closely related areas that are likely to influence and affect your career, such as object-oriented programming or artificial intelligence.

Learning Outcomes

In combining the two disciplines- Electronics and Computers- you will gain an excellent grounding in both subjects plus the chance to explore the exciting interface between the two.

- Interdisciplinary teaching within the University gives you access to cross-discipline modules taught by subject specialists.
- Our faculty are conducting world-leading research in Machine Learning, Memory Technology and Biomedical Electronics, enabling you to keep up with the latest advances throughout your Degree.
- You will obtain hands-on practical experience of designing and constructing electronic systems using computer simulation and practical laboratory work.
- This cutting-edge program adapts to the latest developments in Electronics Technology.

Academic Framework

Our Electronics and Computer Engineering program will provide you with the knowledge of electronics and its application, computer systems and the latest software to prepare you for a career in Information Technology and Computing Industries. This Degree is designed to cross the boundaries between hardware electronics, software and computer systems.

Following a common core in electronics and computing, you will take modules in computer programming, operating systems, computer architectures & graphics, networking and the structure and operation of the internet, enabling you to develop a thorough understanding of modern computer systems.

Cutting Edge Labs

The program covers topics such as digital signal processing, data and internet networking, mobile devices, multimedia systems, image processing, speech analysis, graphics, computer vision, and artificial intelligence, with hands-on learning in our labs.

Individual project work utilises state-of-the-art computing and audio-visual processing facilities, giving you access to the latest mobile computing devices.

Careers

An Electronic Engineer can find a job in the consumer electronics manufacturing organisation, telecommunication and IT industry, healthcare equipment manufacturing organisation, mobile communication (2G,3G,4G), internet technologies, and power electronics industry.

As a student at Chitkara University, you can choose your own path. ECE course at the University, offers in-depth study in a wide range of diciplines that will open doors to almost any career you can imagine. You can create your own mix of qualifications and choose a career in the following fields:

- Biomedical Engineering
- Energy Systems
- Mechatronics & Systems Control
- Software & Hardware Engineering
- Digital & Analog Electronics
- Electromagnetics & RF Microwave
- Photonics
- Communications

ELECTRONICS & COMMUNICATION ENGINEERING

4-Year Bachelor of Engineering

SPECIALISATIONS

After completion of the 4th semester in B.E. (Electronics & Communication Engineering), the students will have the opportunity to pursue specialisation in any one of the following fields:

- **Embedded Systems and IOT**
- **VLSI Design**

Program Objectives

Electronics & Communication Engineering deals with electronic devices, circuits, communication equipment like transmitter, receiver, integrated circuits (IC). It also deals with basic electronics, analog and digital transmission & reception of data, voice and video (AM, FM, DTH), microprocessors, satellite communication, microwave engineering, antennae and wave progression.

The fields, Engineering and Communications, combined together prove to be a fascinating and challenging choice, with well-qualified graduates being in high demand in global industries. At Chitkara University, the course begins by providing students with an understanding of the basic principles of Electronic Engineering, whilst developing their skills in maths and computing. We aim to deepen knowledge and skills that will equip you in your professional work involving analysis, systems implementation, operation, production, and maintenance of the various applications in the field of Electronics and Communications Engineering.

Learning Outcomes

Group design/ project work is incorporated into all modules. Final year students are mandated to be a part of a team project, within the University or outside, to facilitate hands-on learning and industry interaction. Future Engineers:

- Design and maintain satellites, which bring TV, telephone and Internet service into remote and rural regions.
- Create advanced communication facilities to bring people together from all over the world.
- Develop programs for various control and communication systems.

Academic Framework

In the Ist & IInd year, students are given a thorough introduction to Electronics, covering the key areas of circuits and operational amplifiers. The curriculum includes basic circuit analysis skills, operational amplifiers from a theoretical and practical basis, and associated mathematical concepts and tools.

In the IIIrd year students are introduced to the propagation of high-speed signals around circuits & systems, and the principles of noise within them. The year also includes in-depth study of the concepts of Signal Integrity & Electromagnetic Compatibility, and the effects of not achieving EMC on system operation. Fundamental concepts that lead to these problems and their mitigation are also revealed.

In the IVth year future engineers are involved in the entire life cycle of a product - from concept through design and computer modeling to creating the hardware device. Students get hands-on experience on projects by working in teams – taking a technical problem, capturing the requirements, creating a specification for a solution, simulating it using industry standard software tools, before final implementation in hardware.

Cutting Edge Labs

The Engineering department at Chitkara University, is well-established with state-of-the-art technology to impart knowledge for future industrial and educational needs. The department is equipped with DSP, Microprocessor, Communication, Optical, VLSI and Embedded Systems.

Our labs offer students the opportunity to work on a wide range of advanced software packages, with modern equipment supported by special purpose software packages like ETAP, MATLAB, CAPSA, LABVIEW, ORCAD, MULTISIM, KEIL, PSIM and MAGNET.

Scope of Employment

There are many opportunities for Electronics and Communication Engineers as they are employed in variety of sectors such as Telecom Industries, Civil Aviation, Development Centers in various States, Defense, NPL, A.I.R, Posts and Telegraph Department, Railways, Bharat Electronics Limited, D.R.D.O, Telecommunication, Software Engineering/IT, Power sector, Hardware Manufacturing, Home Appliance and VLSI design, Television Industry and Research & Development. Some industry roles include:

- Service Engineer
- Technical Director
- Senior Sales Manager
- Customer Support Engineer
- Research & Development Software Engineer
- Software Analyst
- Field Test Engineer
- Network Planning Engineer
- Electronics and Communications Consultant

Our students have obtained prestigious placements at leading companies such as Infosys, nVidia, Texas Instruments, Cadence, ARM, etc.

SPECIALISATION IN EMBEDDED SYSTEMS & INTERNET OF THINGS (IoT)

Introduction

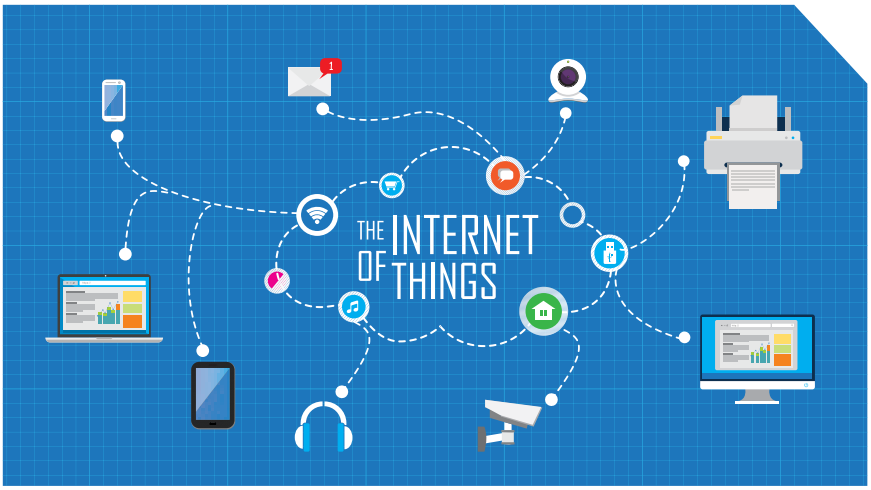
The explosive growth of the "Internet of Things" is changing our world. At Chitkara University, students can pursue specialisation in Internet of Things (IoT), which is among the newest innovations in the field of information technology, and change the way we receive information. This technology connects devices to each other, and to the people who use it in their daily life.

Embedded systems are gaining importance in all aspects of Engineering. It is expected that in the near future no technical device will exist without software-based embedded information technology, based on standardised micro-controller cores. This implies that the design of embedded real-time operating systems will play a dominant role in this field.

What You'll Learn

With this specialisation you will learn the importance of IoT in the society, the current components of typical IoT devices and trends for the future. Student will:

- IoT design considerations, constraints and interfacing between the physical world and your device will also be covered.
- Make design trade-offs between hardware and software.
- Cover key components of networking to ensure that students understand how to connect their device to the Internet.
- Study how various trends have enabled the Internet of Things, and how it changes the way design is performed.
- Participate in regular open house interactions to discuss some of the ramifications that IoT is having on society today.



Careers

As digital transformation continues to accelerate, IoT is at the center of this change - supporting organisations' digital journeys and offering professionals exciting career opportunities. Research and advisory company, Gartner, Inc., predicted that 8.4 billion connected things will be in use worldwide in 2017, up 31 percent from 2016, and will reach 20.4 billion by 2020. In India alone, more than 1000 tech start-ups are engaged in IoT-related projects, offering plenty of job opportunities. Here are some of the roles:

- IoT Engineer
- IoT App Developer
- IoT Solution Architect
- Citizen IoT Scientist
- Machine Learning Engineer
- IoT System Administrator

SPECIALISATION IN VLSI DESIGNS

Introduction

Very Large Scale Integrated (VLSI) Design is the process of designing computer chips, more specifically, integrated circuits (IC) using computer-aided design (CAD) tools on a workstation or a personal computer.

At Chitkara University, the objective of this program is to provide students with comprehensive knowledge of VLSI circuits and systems which is core to the electronics chip manufacturing industry.
The program emphasis the key aspects of hardware design and development for VLSI applications. Prime focus is laid on the areas like VLSI system design, ASIC design, FPGA based systems design, RF circuit design, and SOC based design and verification.

What You'll Learn

The VLSI discipline is for design and verification of electronics systems and circuits. Its applications are found in areas like signal processing, image processing, networks and communication applications.

The curriculum focuses on employing hierarchical design methods and understanding the design issues at the various levels of hierarchy. Students are exposed to various design software in this program, and learn to design, simulate, implement & test complex digital systems using FPGAs (Field Programmable Gate Arrays).
The main objectives of the course are to analyse the electrical and design characteristics of transistors, gates and study the issues & methodologies involved in the integration of these devices into complex high-performance systems.

Careers

With recent and rapid upsurge in the areas like hardware, software co-design, architectures for machine intelligence, network on chip etc., the program is designed to cater to the needs in producing Engineers trained, in both, hardware and software, bridging the gap between the academia and industry. Apart from a bright scope to pursue higher education and research, students can pursue **career opportunities in diverse fields such as Process Industry, Manufacturing Industry Consumer Electronics, Communication Networks and Automation Industries.**

Students can find excellent placements in leading core companies like IBM, Texas Instruments, NXP, Wipro, GE, Motorola, Honeywell, HCL Technologies, Tata Elxsi, RBEI, TATA, DELPHI etc.

ELECTRICAL ENGINEERING

4-Year Bachelor of Engineering

SPECIALISATIONS

After completion of the 4th semester in B.E. (Electrical Engineering), students will have the opportunity to pursue specialisation in any one of the following fields:

- **Hybrid & Electric Vehicle Technology**
- **Industrial Automation**

Program Objectives

Electrical Engineering is one of the largest and most diverse technological and Engineering disciplines in today's world. This branch of Engineering deals with the study and application of Electricity, Electronics and Electromagnetism for the development and maintenance of Electrical and Electronics equipment such as electric motors, navigation systems, medical devices, broadcast and communication systems, power generation systems, electrical distribution systems, electric grids etc., while keeping in mind the safety, quality, economic feasibility and sustainability of these products and systems.

Based on the fundamentals of Physics and Mathematics, Electrical Engineering became a field of its own in the 19th century due to innovations such as the generator, motors, telephone, wireless communications and electronics. Ever since, this field has sure come a long way. Not only has it been one of the major driving forces behind cutting-edge technology in areas such as Power Engineering, Computer Engineering, Communications and Mobile Technologies, it has also significantly impacted several other fields such as Nanotechnology, Biomedical Engineering, Neuroscience and Biotechnology, etc.

Learning Outcomes

Electrical Engineers specialise in power supply and generation. Students use Science, Engineering, technology and analytical reasoning, creative & critical thinking skills to solve problems & design, construct & maintain electrical and electronics products. As a result:

- Students design, develop, test and supervise electrical equipment manufacturing.
- Students train to handle responsibilities like wiring and lighting installations in buildings, automobiles and aircraft.
- Students study various sub-disciplines of Electrical Engineering that students will be studying include, Electronics, Digital Computers, Power Engineering, Telecommunications, Control Systems, RF Engineering, Signal Processing, Instrumentation, and Microelectronics.

Academic Framework

- The Ist year of Electrical Engineering will cover basic Science courses such as Mathematics, Physics, Chemistry and a basic overview of other engineering disciplines such as Mechanical Engineering, Civil Engineering, Electronics,

Introduction to Computers, among others.

- The IInd and IIIrd year, will expose students to core subjects in Electrical Engineering, including power system analysis, motors, transformers, control systems, high-voltage engineering, power electronics, power system economics & control techniques, power system protection, switchgear and utilisation of electrical energy.
- In the fourth year, students will be given an option to choose their elective subjects. They will also be aided in acquiring an internship.

Cutting Edge Labs

At Chitkara University, we have world class labs including:

- Power Systems Research
- LabProtection and Switchgear Lab
- Control Systems Lab
- Digital Simulation Lab
- Power Electronics & Drives Lab
- Analog and Digital Circuits Hardware Lab
- Virtual Instrumentation Lab
- Process Control Lab
- EDC and Device Research Lab
- Solar Energy Lab
- Measurement & Instrumentation Lab
- NxP Semiconductor Lab
- Electrical Machines Lab
- Q-Max Technology Lab
- Industrial Automation Lab

Scope of Employment

Qualified Electrical Engineers are always in demand since most industries use electricity and electric machines. Engineers are required by industries for operational, maintenance and manufacturing purposes. For graduates, job opportunities are ample, in both private and public sector, including railways, civil aviation, electricity board and utility companies, electrical design & consultancy firms and all types of manufacturing industries.

Companies like ABB, Bajaj International Private Ltd, Crompton Greaves Limited, Siemens Ltd, Reliance Power Ltd, Oil and Natural Gas Corporation (ONGC), Bharat Heavy Electricals Limited (BHEL), Steel Authority of India Limited (SAIL), Coal India Limited (CIL), Power Grid Corporation of India Limited (PGCIL), Centre for Electronics Design and Technology and Wipro Lighting are the biggest employers hiring Electrical Engineers. Core companies such as Qualcomm, Intel, Ericsson, NVidia, Analog Devices Ltd, Broadcom, Cisco systems, Cosmic circuits, Ericsson India Global Services, Eaton technologies, IBM, Schneider electric, General Electric, Analog devices, Cosmic circuits Pvt Ltd, KLA Tencor, NTT Communications, Texas Instruments also hire Electrical Engineers.

SPECIALISATION IN HYBRID & ELECTRIC VEHICLES

Introduction

Students who undertake Electrical Engineering, would have an option to pursue specialisation in Hybrid and Electric Vehicles. This innovative program will cover a variety of aspects of future vehicle design, technology and management. The coursework provides advanced knowledge and hands-on labs facility to learn design, analysis, control, calibration, and operating characteristics of HEVs.

Hybrid and electrical vehicles are surely the future. India had enforced Bharat stage IV norms across the country since October 2010, based on the European emission norms. Each stage specifies a certain limit on pollutants released, which is controlled by the type of fuel made by the oil companies, and the up-gradations and modifications made by the auto firms to their vehicles. Considering the environmental impact, rising pollution levels and health hazards due to vehicular pollution, the Indian Oil Ministry recently took the view that the country should switch over directly from BS-IV to BS-VI fuel standards. Thus, pushing stringent emission norms for engine designers to make vehicles with modifications, striving for maximum efficiency and minimum pollution - and in turn increase the scope for employability in the field.

What You'll Learn

The future sounds intriguing as Engineers continue to develop the next generation vehicles, while standing at the forefront of innovations. Students will:

- Learn the nuances of design, production and manufacturing of cars, trucks, buses or motorcycles.
- Learn to combine tools and methods used in Mechanical, Electrical, Electronic, Safety and Software Engineering, integrating both aesthetic as well as safety features.
- Study additional modules including, control and calibration, vehicle modeling, vehicle dynamics, lightweight structures, new sustainable materials and recycling, electro-mobility and intelligent transportation systems.

Careers

Students who graduate from Chitkara University with specialisation in Hybrid and Electric Engineering can find their career progression in research and test services to the Automotive, Defence, Aerospace and Rail sectors. Graduates can find various roles in the field as:

- Automotive Manufacturing Engineer
- Automotive Technical Consultant
- Automotive Designer
- Quality Assurance Manager

SPECIALISATION IN INDUSTRIAL AUTOMATION

Introduction

As Automation is the heart of any industry, it has found its place and importance in industries to handle any sophisticated process to increase productivity with quality. A specialisation in Industrial Automation is a powerful career choice that demands good problem-solving skills combined with excellent domain knowledge with an eye for detail. The course includes a diverse range of theoretical and practical skill training, presented in the context of real applications and design experience.

What You'll Learn

Some of the key components of this specialisation will be:

- Knowledge and technical expertise of building, analysing, testing, operating and maintaining electrical, instrumentation, control systems and associated green technologies.
- Maintenance, repair and production of electrical automation equipment and its systems.
- Procure, inspect and test electrical and electronic engineering materials.
- Select, operate, maintain, test and repair/ replace electrical and electro-mechanical automation machinery used in various industrial appliances.
- Industrial installation including automation components, programming and reprogramming of logic controllers cum drives, laying cables, earthing, installing motors, drives with their accessories, wiring and testing of control circuits.
- Estimate preparation of different kinds of jobs in domestic, industrial automation in transmission and distribution systems to install, erect and commission the power and automation equipments.

Careers

The importance of Automation Engineers in fields like Airport and Cargo Management, Railways, Building Automation and other areas like Automation in Manufacturing Industries, Process Industries shall be a paramount one. Further, with almost every industry spending major money on training its employees, this specialisation shall enable the industries to deploy students directly into the field with minimum on-hands training at their cost. Thus, the career opportunities are many, including roles in:

- Factory Automation
- Energy Management
- Sustainable Design & Solutions
- Power Engineering
- Operations Management
- Entrepreneurship

CIVIL ENGINEERING

4-Year Bachelor of Engineering

SPECIALISATIONS

After completion of the 4th semester in B.E. (Civil Engineering), students will have the opportunity to pursue specialisation in any one of the following fields:

- **Public Health Engineering**
- **Construction Engineering Management**
- **Structural Engineering**

Introduction

Civil Engineers conceive, design, build, supervise, operate, construct and maintain infrastructure projects and systems in the public and private sector, including roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and sewage treatment.

Engineers work with many other professionals in teams to make our world a better place. Their work space may include different places, like offices and laboratories, far-flung or not so common sites or places others never get to go, such as underground and at sea! These opportunities make Civil Engineering one of the most exciting careers choices around.

- Earthquake Engineers make sure structures can withstand earthquakes.
- Environmental Engineers protect the environment and protect us from extreme weather.
- Geotechnical Engineers focus on the ground, which affects everything built on it (buildings), with it (dams and levees) and in it (tunnels and pipelines).
- Project Management Engineers make sure entire projects are delivered on time and on budget.

A Degree in Civil Engineering covers a plethora of scientific topics, including, Mechanics, Hydraulics, Materials Science and Statistical Analysis. At the Chitkara University, the study of these foundation subjects will be complemented with the development of design skills, with computer-aided designs in particular. The final year will involve field trips and the conception of several personal or team projects, which will further play an important role to provide on-the-job training and real-life application of knowledge.

Learning Outcomes

With Engineering, you can follow your interests both in what you do and where you do it- be it on a construction site, building, testing and monitoring developments or in a sport working as an Engineer to create world-class sporting venues. You can also make a difference in people's everyday lives, and work in a team to rebuild a community following a natural disaster – or even prevent the disaster from happening in the first place! To help you achieve your dream, following are some learning outcomes that you can expect:

- Make good decisions based on best practices, technical knowledge, and experience.
- Balance multiple and frequently conflicting objectives, such as determining the feasibility of plans with regard to financial costs and safety concerns.

- Develop leadership skills to take ultimate responsibility for the projects that you manage or research.
- Use the principles of Calculus, Trigonometry, and other advanced topics in mathematics for analysis, design, and troubleshooting.
- Monitor and evaluate the work at a jobsite by acquiring organisational skills.
- Develop excellent problem-solving skills - identify and evaluate complex problems – to manage planning, design, construction, and operation of multifaceted projects or research. Further, learn to use your skill and training to develop cost-effective, safe, and efficient solutions.
- Brush up your communication skills to present reports and plans to audiences with varied range of backgrounds and technical knowledge.

Academic Framework

The basic study framework at Chitkara University, includes, coursework in Mathematics, Statistics, Engineering Mechanics and Systems, and Dynamics. The curriculum is a mix of traditional classroom learning, work in laboratories, and fieldwork. Programs also include cooperative programs, also known as co-ops, in which students gain work experience while pursuing a Degree.

Additionally, our curriculum lays intensive focus on:

- Strength of Materials
- Construction Technology
- Soil Mechanics
- Concrete Technologies
- Structural Analysis
- Building Drawing
- Reinforced Concrete Structures
- Transportation Engineering
- Hydraulic Structures and Machinery
- Environmental Engineering
- Design of Steel Structures
- Water Resource Engineering
- Construction Management

Cutting Edge Labs

Students have access to many facilities in the form of nine well-equipped, state-of-the-art laboratories. These include:

- Structure and Construction Engineering Lab
- Computer Lab
- Soil Mechanics Lab
- Hydraulics and Fluid Machinery Lab
- Strength of Materials Lab
- Concrete and Highway Lab
- Survey Lab
- Environmental Engineering Lab
- Remote Sensing and GIS Lab

Scope of Employment

A career in Civil Engineering is satisfying, challenging and offers promising prospects for upward progression. It is expected that the demand for Civil Engineers all over the world will only grow in the coming years.

Engineering companies all over the world are in need of Civil Engineers to develop new technologies, build better buildings, create better cities, get people to where they want to go in the best way possible, and counter the devastating effects of climate change. In other words, to improve the future of the planet. This means that the Civil Engineers of tomorrow (you!) are in demand. With a good education and a positive attitude, you will be able to secure an exciting, well-paying job that offers you opportunities to work at the cutting edge of your field, all over the globe.

SPECIALISATION IN PUBLIC HEALTH ENGINEERING

Introduction

The Public Health Engineering sector is responsible for the collection of water, purification, transmission and distribution of water. A Public Health Engineer has to perform his job by calculating design flow, design population, design area and population density. And with increasing problems related to water, air and soil pollution; environmental emergencies; industrial solid and liquid waste management; industrial and occupational safety; and toxic chemical hazards, Public Health Engineers have a greater role to play in today's scenario as well as in future.

While Public Health Engineering is the contemporary term used for "Sanitary Engineering". The term traditionally did not include much of waste management and environmental remediation work covered by environmental engineering.

Today, a Public Health Engineer's role encompasses collective responsibilities right from ensuring that a water level is monitored and regulated, rivers are engineered to work with expanding populations, water and wastewater treatment systems are designed to meet growing demands or assessing and minimising water usage in domestic and industry applications.

What You'll Learn

If you want to make a difference in combating this pressing global problem, as innovators of water-friendly products and services to improve quality of life, this specialisation in Civil Engineering will put you on the right track. Some of the key components you'll learn include:

- Applying knowledge and technical expertise in building, analysing, testing, operating and maintaining civil, green water (fresh), grey water (waste) and associated green technologies, including the study of relevant industry standards and code of practices.
- Learn the nuances of maintenance, repair and production of plumbing, sanitation and water resource equipment and its systems.
- Conceptualise, visualise and design of MEP services pertaining to plumbing and sanitation that include water supply & treatment, waste water disposal & recycling, and solid waste disposal.
- Procure, inspect and test civil and plumbing engineering materials.
- Fault diagnosis, repairing industrial/ domestic fresh water lines (cold and hot), making joints and carrying out pipe laying and plumbing work.

Careers

A career in Civil Engineering with specialisation in Public Health offers promising prospects with the lure of earning an above average income. Some career expanses that students can explore after their specialisation include:

- Building Engineering & Services
- Water Resources Engineering
- Renewable Water Resources Management
- Facility Management
- Operations Management
- Sustainable Design & Solutions
- Clean Energy
- Research & Development
- Entrepreneurship

SPECIALISATION IN CONSTRUCTION ENGINEERING MANAGEMENT

Introduction

Construction Engineering is a professional discipline that deals with the designing, planning, construction, and management of infrastructures such as roads, tunnels, bridges, airports, railroads, facilities, buildings, dams, utilities and other projects.

What You'll Learn

Specialisation in Construction Engineering Management will provide students the knowledge of Civil Engineering with extensive focus on modern construction materials, techniques and effective construction management practices. Through this program, Civil Engineers become capable of constructing special structures and manage complete projects within a given schedule and budget. The course includes:

- Introduction to the basics of Science, Mathematics, Engineering Graphics and Computing techniques. Laboratory classes for practical understanding are also conducted.
- Fundamental principles to study the behaviour of solids, fluids and soils. Transportation Engineering and Environmental Engineering.
- Focus on analysis & design of steel & concrete structures and foundation Engineering.
- Students can opt for special electives in: Modern Structural Materials and Systems Design, Shoring, Scaffolding and Form Work, Construction Personnel Management, Project Safety Management, Quality Control & Assurance in Construction, Quantitative Techniques in Management, Contract Laws and Regulations.
- A design project and a main project in the areas of Construction Engineering and Management.

Careers

Chitkara University students are groomed under high standards of program delivery and rigorous curriculum. This will naturally make them capable enough to match any employer's expectations. Civil Engineers who specialise in Construction Engineering Management, can find jobs in government departments, private and public-sector industries. Opportunities are also available in research and teaching institutions. Abundant jobs opportunities are available to graduates as:

- Planning Engineer
- Quality Control Engineer
- Site Engineer
- Project Manager

SPECIALISATION IN STRUCTURAL ENGINEERING

Introduction

Structural Engineering includes the design of buildings & bridges, and considering loads such as wind, earthquakes and people. These design structures could include materials such as concrete, steel, timber, masonry and fiber-reinforced polymers. The specialisation is basically concerned with the conception, analysis, design and construction of the above components or assemblies to resist loads arising from internal and external forces.

At Chitkara University, the specialisation includes the study of solid mechanics, which is the study of the distribution of stresses that a given load produces when applied to a solid element, and the calculation of the resulting strains, given the characteristics of the materials that make up that element.

What You'll Learn

This specialisation is designed to train you in advanced concepts of Structural Engineering by in-depth coursework, hands-on modeling projects and dissertation work. Students will undergo intensive modules to study various aspects of Structural Engineering and learn how to apply these constructs to a major research project. You will learn:

- Application of Solid Mechanics that enables the Structural Engineer to assemble elements, such as beams and columns, into a structure that will resist both static and dynamic loads, such as gravity, wind, snow and earthquakes.
- In addition to steel and concrete, a know-how of new materials that are being developed and used in Structural Engineering, including reinforced plastics and polymers.
- Rehabilitation of existing structures weakened by corrosion.
- Designing the structures of machinery, vehicles, aircraft and spacecraft.

Careers

Employment opportunities include work with consulting Structural Engineers, construction companies, building development companies, Engineering departments of private corporations, aircraft and aerospace related companies, public utilities, and government agencies. Major employers of Structural Engineers include:

- Engineering Consultancies
- Railway Operators
- Public Utility Companies
- Oil Companies
- Civil Engineering Contractors

FIRE & SAFETY ENGINEERING

4-Year Bachelor of Engineering

Program Objectives

A Bachelor's Degree in Fire and Safety Engineering technology is designed to prepare students to assess and reduce the loss potential of fire, safety and hazardous material incidents. Fire & Safety cover the study of simulated fire-fighting exercises along with applied Physics, Chemistry and Mathematics. It also involves the comprehensive study of subjects that deal with the designing of safer fire-resistant equipment, in-depth knowledge of fire, its properties, hazards and control measures.

Students examine current trends in Fire Sciences and receive practical instruction in equipment operation. The curriculum focuses on loss prevention, safety program management, occupational safety, fire prevention, suppression and investigation. In addition to traditional classroom teaching, instruction is conducted through hands-on training and computer-simulated activities.

Learning outcomes

This field provides a great opportunity for individuals who are always willing to help and contribute to the social defence and to invent new strategies related to fire & safety. This course requires a blend of personal skills such as good communication, organisational ability, quick decision making and problem-solving skills and physical fitness & agility, the presence of mind, self-discipline, and leadership qualities.

The Fire & Safety Engineering course is suitable for those who are courageous and can step forward in case of critical fire situations for the safety of people and property. Also, candidates who have plans to become professors can also go for this unique branch of Engineering.

The major objective is to prepare students to excel in areas related to protection of people, property, and the environment. Typically, the Fire & Safety Engineers are trained to:

- Anticipate, identify and evaluate hazardous conditions and practices.
- Develop hazard control designs, methods, procedures, and programs.
- Draft a future safety plan and statement based on real-time experiences and facts.
- Measure, audit and evaluate the efficiencies of accident-prone processes.
- Implement, administer and advise others on hazard control programmes.

Academic Framework

A typical Fire & Safety Engineering program coursework provides students with a solid foundation in the design, testing, analysis and implementation of fire protection systems. Students gain an

advanced understanding of Science, Engineering, Mathematics and Computers in order to better solve technical problems. Some of the major topics included in the program's core curriculum are:

- Fire suppression and detection systems
- National fire alarm codes
- Fire behaviour and combustion
- Hazardous materials
- Human factors in fire and safety
- Structure design for fire safety

Cutting Edge Labs

We have strong industrial engagement and input to teaching, including our design projects. There are opportunities for interaction with recent graduates working in industry and we offer a close-knit, supportive community within which you can develop your Engineering skills. Students will have access to the University's libraries and laboratories, and will be taught through a combination of lectures, tutorials, laboratory sessions, projects and group work.

Scope of Employment

Graduates from a Fire & Safety Engineering program can utilise their knowledge and skills in a variety of careers ranging from protection system design to consulting. In recent times, there is a heavy demand for Fire Engineers both in India and abroad, thereby providing them with a plethora of career options in public and private sectors, defense services, oil & natural gas sector, construction field work, automobile industries, airports, healthcare institutes and hospitals. Graduates can be employed as safety professionals like Safety Inspector, Fire Supervisor, Safety Engineer, Fire Men, Sub Officer, Safety Officer, HSE Engineer, Safety Supervisor, HSE Advisor, Safety Assistant, Fire Protection Technician and Fire Officer.
In the government sector, there are jobs in the Defense Forces, Railways, Airport Authority of India, Electricity Boards, C.I.S.F., ONGC, Mines, Refineries, Petrochemical complexes, fire brigades or other such organisations.

Following are some of the industries that offer job prospects to Fire & Safety Engineers:

- Fire Departments
- Fire Equipment and Manufacturers
- Consulting Engineering Firms
- Government Sector
- Research & Laboratories
- Hospitals and Health Care Centers
- Insurance firms
- Universities & Colleges
- Forensic Investigational firms

MECHANICAL ENGINEERING

4-Year Bachelor of Engineering

SPECIALISATIONS

After completion of the 4th semester in B.E. (Mechanical Engineering), students will have the opportunity to pursue specialisation in any one of the following field:

- **Automotive Engineering with an introduction to Hybrid and Electric Vehicles**

Program Objectives

Mechanical Engineering is a discipline of Engineering that is concerned with the working mechanisms of heavy tools and machineries. It applies the principles of Physics and Materials Science for analysis, design, manufacturing, and maintenance of mechanical systems. Students are introduced to the Science & Art of formulation, design, development and control of systems, with components involving Thermodynamics, Mechanics, Fluid Mechanics, mechanisms and conversion of energy. The program addresses both the quest to understand how things work and the desire to put this understanding to practical use. Students are constantly guided by faculty of national and international recognition, who are also members of prestigious Engineering societies and counted among the outstanding scholars in their profession.

The Science of Mechanical Engineering emerged in the 19th century as a result of developments in the field of physics. The field has continually evolved to incorporate advancements in technology. Mechanical Engineers today are pursuing developments in fields such as composites, Mechatronics and Nanotechnology.

At Chitkara University, our expert faculty is committed to the advancement of the fundamental Engineering Sciences encountered by undergraduates in a curriculum that is heavy in "basics." This is balanced by their demonstrated interest and active participation in practical developments as well.

Learning Outcomes

Mechanical Engineers research, design, develop, build, and test mechanical and thermal devices, including tools, engines, and machines. As Mechanical Engineering students you will have an ability to:

- Apply knowledge of Mathematics, Science, and Engineering.
- Design and conduct experiments, as well as to analyse and interpret data.
- Design a system, component, or process to meet desired needs within constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Function in multi-disciplinary teams, identify, formulate, and solve problems.
- Understand the impact of Engineering solutions in a global, economic, environmental, and societal context.
- Use techniques, skills, and modern Engineering tools necessary for Engineering practice.

Academic Framework

The program provides a broad scientific and technical background in Mechanical Engineering. Specialisation is provided in the choice of technical electives from the subject areas of applied mechanics, automatic controls, electro-mechanical systems, energy conversion, fluid mechanics, heat and mass transfer, manufacturing systems and materials processing, mechanical design, cryogenics, thermodynamics, robotics and automation.

During the first two years, the coursework emphasises Mathematics, Physics, Chemistry, Computing materials, Statics and Graphics. In the final two years, the emphasis is on mechanics of solids and fluids, thermodynamics, heat transfer, design and controls; experimentation and system synthesis.

Cutting Edge Labs

Our state-of-the-art laboratories, include:

- Thermal Engineering
- Heat-transfer
- Dynamics
- Metallurgy
- Metrology And Fuels

Modern computing facilities are available for ostudents at the CAD & Computer Integrated Manufacturing Laboratories.

Scope of Employment

Mechanical Engineers are required in all manufacturing facilities. The working criteria of a Mechanical Engineer changes according to the type and domain of the company they are working with and the area of specialisation. In a broader sense it can be said that a Mechanical Engineer works on design and control of a system that goes into the process of manufacturing the machinery and product. He tests new systems for feasibility and efficiency and carries out quality management and improvement process.

There is tremendous scope for Mechanical Engineers in industries including Aerospace, Automotive, Biomedical, Chemical, Computers, Electronics, Fossil and Nuclear Power, Manufacturing, Pharmaceutical, Robotics and Textiles. Further, the scope of employment extends into areas of research & development, design, testing and evaluation, manufacturing, operations & maintenance, marketing, sales and administration. Public sector units like Railways, ONGC, Indian Oil, ISRO, SAIL, NTPC, DDRO and IAF, also have ample job opportunities for Mechanical Engineers.

Leading Mechanical and Automotive companies visit the campus regularly for placement. Our Engineers have successfully obtained placements at leading companies such as Infosys, Godrej, Escort, L&T, Wipro, ISMT, Mahindra & Mahindra, JCB, Eicher, among others.

SPECIALISATION IN AUTOMOTIVE ENGINEERING

WITH AN INTRODUCTION TO HYBRID & ELECTRIC VEHICLES

Introduction

For students who have opted for specialisation in Automotive Engineering, we have introduced a special module on introduction to Hybrid and Electric Vehicles.

Automotive Engineering is concerned with the life-cycle support (design, manufacture, performance and durability testing) of vehicles; from road and off-road vehicles to race cars, vans and trucks. Students taking up this course will get to learn about the application of Mechanical, Thermodynamic, Pneumatic, Hydraulic and Electrical principles with an aim to resolve Engineering problems. During the period of their study, they will get to know how to design and produce visual interpretations of automobiles and their components. They would also be involved in developing test procedures as well as conducting tests by using physical testing methods and software packages. Another interesting aspect of the specialisation at Chitkara University, is that students would also get an opportunity to supervise and inspect the installation, modification, and commissioning of mechanical systems at industrial facilities or plants.

As a part of the specialisation, students will also get to put theory into practice with an opportunity for industry training with the Formula student race car, Supermileage Vehicle, and Baja Vehicle. Industry connections will help students integrate knowledge with the relevant automobile OEM's, IT and Design, or component manufacturing companies like Tata Motors, Maruti, Escorts, Tata Technologies, Mahindra & Mahindra, Infosys, Wipro, Dassault Systemes, etc.

A key challenge for Automotive Engineers today is to design

sustainable vehicles that meet stringent emission norms along with the ever-increasing safety and performance standards, in a cost-effective way. In order to do this, Chitkara University has introduced a special module on introduction to Hybrid and Electric Vehicles (HEVs). As a part of this study module students will be introduced to a variety of aspects of future vehicle design, technology and management. The coursework will also include introduction to design, analysis, control, calibration, and operating characteristics of HEVs.

What You'll Learn

Students interested in the field of Automotive Engineering complete the first two years of Mechanical Engineering, and then focus on Automotive Engineering with introduction to Hybrid and Electric Vehicles. They are taught:

- Basics of automotive Engineering, automotive material and component testing, automotive chassis Engineering, automotive driveline, vehicle dynamics and analysis, automotive electronics, fuels and combustion, emissions and safety standards.
- Knowledge of Hybrid and Electric Technology and future expectations, aimed at meeting India's stringent emission norms.
- Introduction to design, production and manufacturing of cost-effective vehicles.

Careers

With electric vehicle sales predicted to reach 45 million worldwide by 2040, the next twenty years are set to dramatically change the automotive market. The likes of BMW, Toyota, Mercedes Benz, Kia, Volkswagen, Electric Vehicle (EV) specialists Tesla and many more car manufacturers have a number of hybrid and EVs on the market, with more in the manufacturing pipeline. With the excitement growing around the alternative low-emission vehicle type we anticipate that the mass adoption of these vehicles could mean a change in the skills required from Automotive Engineers.

Typical employers of Automotive Engineers include: car, commercial vehicle and motorcycle manufacturing companies; companies serving specialist markets such as sports or luxury cars and test laboratories automotive component suppliers tyre manufacturers, accessory and safety equipment manufacturers fuel and oil companies motorsport teams, preparation specialists and engineering consultancies.

Leading Mechanical and Automotive companies regularly visit our campus for placement. Our students have successfully obtained placements at companies such as Tata Motors, Maruti, Mahindra & Mahindra, among others.

MECHATRONICS ENGINEERING

4-Year Bachelor of Engineering

Program Objectives

Mechatronics Engineering is the branch of Science which includes the study of principles of Mechanical Engineering, Electronics Engineering, Computer Engineering, Telecommunications, System Engineering and Control Engineering – and focuses on real-world application of these principles.

Mechatronics Engineers typically act as the link between Technicians and Engineers, and work from conception of a project to the completion of the project. They also assist with design, development, and testing of electrical or electronic equipment. When mechanical equipment includes electrical or electronics components, Mechatronics Engineers also design, develop, and test that machinery.

Learning Outcomes

Mechatronics Engineers work in all aspects of the development of the smart machine – from design and testing right through to manufacture. This could be in industries like robotics, medical and assistive technology, human-machine interaction, manufacturing, unmanned aerial and ground vehicles and education. As a Mechatronics Engineer, students can learn to:

- Develop new solutions to industrial problems using Mechanical & Electronic processes and Computer Technology.
- Design and build completely new products by integrating various technologies, for example, developing robotic vehicles for underwater exploration.
- Build and test factory production lines introducing automation to improve existing processes.
- Maintain and improve previous industrial and manufacturing processes and designs, for example, robotic lawn mowers and robot floor cleaners.
- Design, develop, maintain and manage high technology Engineering systems for the automation of industrial tasks.
- Apply Mechatronics or Automated solutions to the transfer of material, components or finished goods.
- Apply advanced control systems, which are usually computer-driven.
- Apply electronic and mechanical processes and computers to tasks where the use of human labour may be dangerous (like underwater exploration, mining or forestry).
- Study the feasibility, cost implications and performance benefits of new Mechatronics equipment.

- Carry out modeling, simulation and analysis of complex Mechanical, Electronic or other Engineering systems using computers.
- Provide state-of-the-art equipment/ instruments for testing and measuring, to acquire data, analyse problems, and design a system or process.
- Provide infrastructure, including well-equipped laboratory and library, to facilitate Engineering Technology projects at the University campus.

Academic Framework

The curriculum within Engineering in Mechatronics program at Chitkara University includes a wide variety and blend of Electrical, Electronics, Audio, and Mechanical Engineering. The core focus areas of the program include:

- Basics of Mechanical Engineering, Electronics Engineering, Computer Science, Engineering Systems and Control Engineering.
- Introduction to Robotics & Artificial Intelligence, along with Machine Vision.
- Study of Fluid Power Technology - Hydraulics and Pneumatics - and its technology developments.
- Study of Computer Hardware and Software.
- Study properties and applications of Materials Science.
- Analog/Digital Electronics and Communications.

Cutting Edge Labs

Building upon Chitkara University's tradition of providing an interactive hands-on education in technology, our objective for students is to:

Scope of Employment

Mechatronic Engineers can also find a place in global enterprises developing futuristic vehicles, challenging defence technology and revolutionising consumer products. They may also work in smaller innovative 'high tech' companies supplying software and equipment – and they could be product developers, work in manufacturing, or mining or defence industries, and in government and industry research groups. Therefore, being an emerging field, this program presents flexible opportunities for graduates. Some of the fields graduates could explore, include:

- Automation and Robotics
- Design of Subsystems for Automotive Engineering
- Expert Systems and Artificial Intelligence
- Medical Mechatronics and Medical Imaging Systems
- Computer Integrated Manufacturing Systems
- Machine Vision
- Sensing and Control Systems
- Industrial Electronics and Consumer Products
- Structural Dynamic Systems
- Diagnostic and Reliability Techniques

BACHELOR OF COMPUTER APPLICATIONS

3-Year BCA

Program Objectives

With the rapid growth of IT industry in India, the demand for computer professionals is increasing day by day. This increasing growth has opened a plethora of opportunities for computer graduates. Bachelor in Computer Application (BCA) is one of the most popular undergraduate courses among the students who want to make their career in the IT (Information Technology) field.

Fast growing information technology and communication systems have become critical components of almost every company's strategic plan. Companies who want to take advantage of the new information technologies and communication systems require expert professionals who can apply Computer Science principles to solve problems produced by the interface between business and technology. Our BCA program, exposes students to various areas of Computer Applications including the latest developments in the industry, at an undergraduate level.

Learning Outcomes

The program imparts comprehensive knowledge with equal emphasis on theory and practice in the field of information technology. A BCA graduate would be able to demonstrate advanced skills in the effective analysis, design and realisation of business systems utilising contemporary information technology.

The broad objective of the programme is to provide sound academic base from which an advanced career in Computer Applications can be developed. Conceptual grounding in computer usage as well as its practical business application will be provided making candidates suitable for IT sector entry-level jobs.

Academic Framework

The BCA curriculum at Chitkara University, has been curated keeping in view the requirements of the IT industry. The curriculum of the undergraduate course, has been put together with extensive inputs from experts from academia and industry. Components such as core Computer Science courses, programming languages, application-oriented courses and soft skills courses make the curriculum complete. The final semester of the program is devoted to a project which can be carried out at the software industry or in the University itself.

As a part of the program, students are also taught to carry out analysis and synthesis involved in Computer Systems, Information Systems and Computer Applications.

Cutting Edge Labs

At Chitkara University, training pedagogy is enhanced through various on-campus learning galleries, state-of-the-art laboratories and experiential learning features of the training facilities.

Scope of Employment

The demand of IT professionals is increasing not only in India but also abroad. After the completion of the course, Students can find jobs in reputed IT companies like IBM, Oracle, Infosys, and Google. Students can work as a System Engineer, Junior Programmer, Web Developer or as a System Administrator. The field provides ample opportunities to make your career not only in private sector but also in the public sector. Government organisations like NIC, Indian Army, Indian Air Force and India Navy also recruit large number of computer professionals for their IT department.

After the completion of the course a student's work profile may include: Systems Engineer, Software Developer, Systems Administrator, Project Manager, Chief Information Officer, Programmers, Systems Analysts, Scientists, Computer Support Service Specialists, Database Administrators, Presentation Specialists, Commercial and Industrial Designers, Independent Consultants, Information Systems Manager, Software Publishers.

5-YEAR INTEGRATED BCA-MCA

Students enrolling in this program can pursue Bachelor's as well as Master of Computer Application without taking a break. Through this program students not only get a world class, "industry-ready" curriculum but also end up saving a year. After the completion of 3 year BCA coupled with intensive classes, students get to spend the last 2 years as an internship in IT companies.

MASTERS OF COMPUTER APPLICATIONS

2-year MCA (Lateral Entry)

Program Objectives

The post graduate (lateral entry) program is designed to meet the growing demand for qualified professionals in the field of Information Technology. The MCA program is inclined more towards Application Development, and thus has more emphasis on latest programming languages and tools to develop better and faster applications.

The MCA program builds on the foundation of computing principles and business practices to train students with the skillset to identify issues, problem solve, and troubleshoot in a wide range of applications. The program at Chitkara University, focuses on providing a sound theoretical background as well as good practical exposure to students in the relevant areas. It is intended to provide a modern, industry-oriented education in applied computer science. It aims at training professionals who can successfully meet the demands of the information technology industry.

Learning Outcomes

As the IT and software industry are dynamic and fast growing, Chitkara University constantly evolves its curriculum for all programs, keeping in view the requirements of industry. This course is not just a postgraduate degree; it is also a complete professional grooming package for students, preparing them for a successful career in the IT Industry.

The MCA program prepares students to take up positions as system analysts, systems designers, programmers and managers in any field related to information technology. The program, therefore, aims at imparting comprehensive knowledge with equal emphasis on theory and practice.

Typically, an MCA degree course covers various aspects of computational theory, programming, algorithm design and optimisation, network and database management, mobile technologies, electronics, mathematics, probability, statistics, accounting, finance, etc. Following areas of expertise will be stressed upon:

- Industry-oriented education with specialisation in Computer Science and technical skills.
- Emphasis on planning, designing and building of complex commercial application and system software.
- A full semester working in the industry to gain an insight into the workings of the IT world.

Academic Framework

Our department has well-qualified and experienced faculty members to handle the various subjects of the Master's program. Following are the modules available:

- Data Structures
- Object Oriented Programming in C++
- Programming in Java
- Computer Architecture
- Database Management Systems
- Software Engineering
- Computer Networks
- Operating Systems
- Computer Graphics
- Principles of Programming Languages
- Theory of Computation
- Compiler Design
- Open Source Programming
- Network Security
- System Testing

Cutting Edge Labs

Apart from the academic curriculum, students are enriched with an assortment of training at the University labs like mock interviews, group discussions, aptitude test, technical interviews and soft skills for boosting their career. A study tour is conducted for every batch to facilitate students to learn out-of-the-box, with good exposure to industrial, cultural and technological trends.

Scope of Employment

With the advancement of IT & Communication systems, people with good Computer Application skills are in high demand, in the IT sector. There is a wide scope for MCA graduates in Government as well as Private sector. Also, self-employment options are available. When it comes to Private sector, Software MNCs are the prime recruiters. Web Hosting, IT Sector, Electronics Industry are some other sectors that recruit graduates. **Top companies that hire Chitkara University graduates include Accenture, Infosys, Wipro, TCS, Cognizant, IBM, American Express, HCL, HP, etc.**

Additionally, after MCA course best opportunities are lined up for the graduates as the scope is high in terms of growing IT companies who look for those with solid theoretical knowledge and practical application of it. Graduates can take up positions as System Analysts, Systems Designers, Programmers and Managers in any field related to Information Technology. Following are some job profiles available:

- Programmers and Software Consultants
- Software Application Development, Testing and Maintenance
- System Analysts and Database Administrators
- Independent Software Developers and Entrepreneurs

NOTES

CHITKARA
UNIVERSITY

WE'RE geekyweirdwonderful LIKE YOU

As a **top ranked University of the country,** our students are passionate and have that drive to investigate and ferret out solutions, to build, to invent, to design, to develop. Not only do we recognize it, we welcome you to bring it on! We know you have the passion, **we will teach you how to harness and apply it.**

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